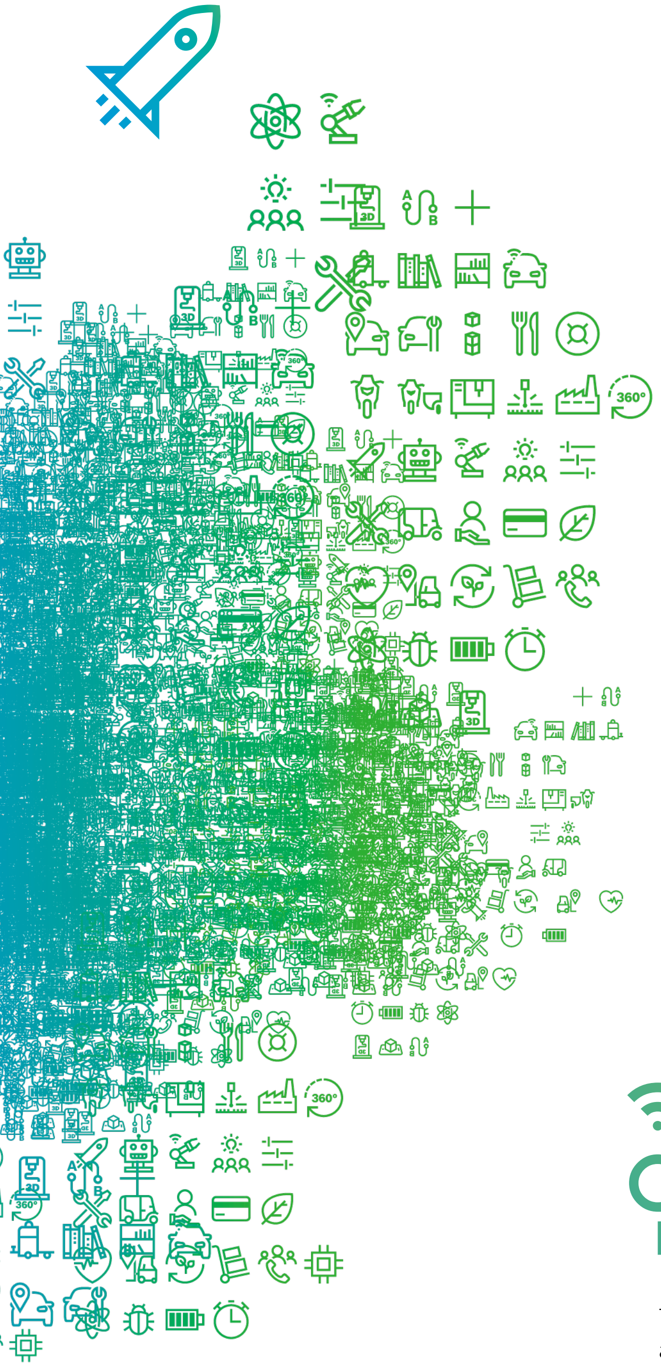
BOSCH

Invented for life

Innovation for times of transition

Annual report 2019

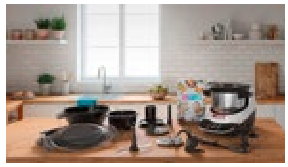


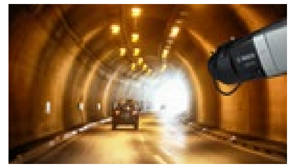
Technologically, our world is in flux. New developments are fundamentally changing the way we live. In times like these, there is an urgent need for technology that is “Invented for life.” We aim to satisfy this need. Keeping areas of future importance firmly in our sights, we are drawing on our company’s wealth of knowledge and profound technological expertise to develop life-enhancing innovations.

The digital magazine that accompanies our latest annual report highlights just some of them.
annual-report.bosch.com

Contents

BUSINESS SECTORS





Mobility Solutions

Powertrain Solutions
Chassis Systems Control
Electrical Drives
Car Multimedia
Automotive Electronics
Automotive Aftermarket
Automotive Steering
Connected Mobility Solutions
Bosch eBike Systems[1]

Other businesses:
Bosch Engineering GmbH
ETAS GmbH
ITK Engineering GmbH
Two-Wheeler and Powersports

Industrial Technology

Packaging Technology[2]
Drive and Control Technology[3]

Other businesses:
Bosch Connected Industry
Robert Bosch Manufacturing Solutions GmbH

Consumer Goods

Power Tools[4]
BSH Hausgeräte GmbH

Energy and Building Technology

Building Technologies
Thermotechnology
Bosch Global Service Solutions

Other businesses:
Robert Bosch Smart Home GmbH

Other businesses not allocated to business sectors:
Bosch Healthcare Solutions GmbH
Bosch.IO GmbH[5]
grow platform GmbH
Robert Bosch Venture Capital GmbH

1. New division from January 1, 2020
2. Until December 31, 2019: Robert Bosch Packaging Technology GmbH
3. Bosch Rexroth AG (100 % Bosch-owned)
4. Robert Bosch Power Tools GmbH
5. Until December 31, 2019: Bosch Software Innovations GmbH

KEY DATA

Figures in millions of euros

	2019	2018
Sales revenue	**77,721**	**78,465**
percentage change from previous year	–0.9	0.5
percentage of sales revenue generated outside Germany	80	79
Research and development cost	**6,079**	**5,963**
as a percentage of sales revenue	7.8	7.6
Capital expenditure	**4,989**	**4,946**
as a percentage of depreciation	146	159
Associates		
average for the year	407,538	407,485
as of December 31	398,150	409,881
Total assets	**89,030**	**83,654**
Equity	**41,079**	**39,176**
as a percentage of total assets	46	47
EBIT	**2,903**	**5,502**
as a percentage of sales revenue	3.7	7.0
Profit after tax	**2,060**	**3,574**
Unappropriated earnings (dividend of Robert Bosch GmbH)	**119**	**242**

The Bosch Group

is a leading global supplier of technology and services. It employs roughly 400,000 associates worldwide (as of December 31, 2019). The company generated sales of 77.7 billion euros in 2019. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. Bosch employs some 72,600 associates in research and development at 126 locations across the globe, as well as roughly 30,000 software engineers.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861–1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

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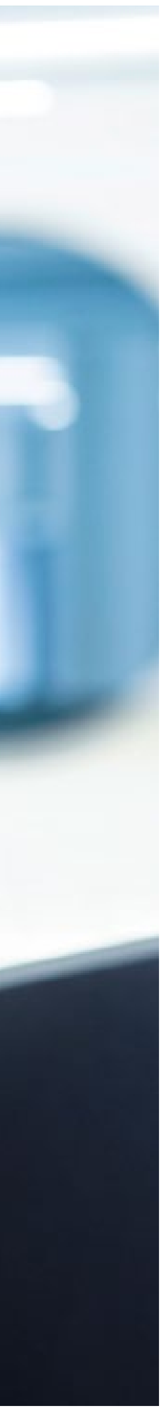
Foreword

"The prospects for Bosch are scintillating, even if the upheavals in markets and technology pose huge challenges for our company."



Dear readers,

Bosch is both a company at the cutting edge and a company in upheaval.

We are working on areas that will affect all our futures, and investing billions in such work. We are turning our visions of sustainable, safe, and exciting driving into reality. We are shaping the factory of the future – a factory that is highly flexible, productive, and eco-friendly. Thanks to our solutions, buildings are becoming more energy efficient, secure, and comfortable than ever. And our electronic devices and household appliances are offering users optimum ease in their daily lives. To achieve this, we are connecting our electronic products with the internet, making them smart, and offering additional services. We are developing novel microchips, fuel cells, production methods, and software, extending our expertise in artificial intelligence and the internet of things – and modifying already successful products. In this context, we have drawn up guidelines for our work on AI. Our maxims are that artificial intelligence should serve people, that it should be safe, robust, and explainable, and that people should retain control over it. As our contribution to climate action, we want all Bosch locations worldwide to be carbon neutral from 2020. With all this in mind, we have given our annual report the title “Innovation for times of transition.” The many examples profiled in the digital magazine make our pioneering work tangible, and our “factbook” documents the progress we have made in the area of sustainability.

Our prospects are scintillating. Yet the technological and market upheavals they entail present our company, its executives, and its workforce with huge challenges. At the present time, this applies especially to Mobility Solutions, our biggest business sector. There, we are having to steel ourselves for changes, some of them painful, in such successful areas of activity as powertrain technology. For our associates in these areas, our aim is to make any adjustments as socially acceptable as possible. In addition, we are having to readjust some parts of our company portfolio. That said, a broad footprint will always remain a Bosch strength.

Both this pioneering work and these upheavals demand a lot of money, and will initially be a burden on our result. Yet as a company, Bosch – whose ownership structure with the Stiftung and the Bosch family allows it a high degree of independence – depends on strong profitability and the ability to finance itself, in order to turn visions of the future into concrete success. Especially on the cost side, therefore, we have a formidable task ahead, all the more so with competition becoming tougher and profits being squeezed harder. This will place considerable demands on our executives and our associates. We will have to pursue our vision for the future while observing strict cost discipline. We will have to establish new fields of activity while also restructuring existing ones. We will need motivated executives and associates, yet will also have to make adjustments, some of them difficult.

What makes this delicate balancing act so challenging is that we must also be prepared to readjust our strategy again and again over the course of the coming decade. The unknown quantities are manifold – whether geopolitical circumstances or the actual form the connected world will take. But we firmly believe that this challenge is worth rising to. The opportunities for the Bosch Group are enormous. Our nearly 400,000 associates also play their part here, with their profound expertise and boundless ingenuity.

On behalf of the board of management, I would like to thank our business partners for their support and the trust they have placed in us as well as our associates for their tremendous commitment and hard work. We would also like to thank the employee representatives for their willingness to engage in constructive dialogue, even in difficult times, and the shareholders and the supervisory board for their support.

With best regards,

Dr. Volkmar Denner
Chairman of the board of management

Board of management

From left

Prof. Stefan Asenkerschbaumer
Dr. Christian Fischer
Peter Tyroller
Christoph Kübel
Dr. Markus Heyn
Uwe Raschke
Dr. Michael Bolle
Dr. Stefan Hartung
Dr. Volkmar Denner
Harald Kroeger
Rolf Najork

Board of management

Dr. Volkmar Denner
Chairman

Corporate responsibilities
- Strategy, Organization, and Business Development
- Communications and Governmental Affairs
- Real Estate and Facilities

Subsidiaries
- Bosch Healthcare Solutions GmbH
- Robert Bosch Venture Capital GmbH

Prof. Stefan Asenkerschbaumer
Deputy chairman

Corporate responsibilities
- Finance, Reporting, and Treasury
- Performance Controlling, Risk Management, Mergers and Acquisitions
- Tax and Customs Duties
- Supply Chain Management
- Global Business Services

Dr. Michael Bolle

Corporate responsibilities
- Research and Advance Engineering
- Technology
- Internet of Things and Digitalization
- Information Systems and Services
- Intellectual Property
- Quality Management
- Field Quality Board

Subsidiary
- Bosch.IO GmbH[1]

Christoph Kübel

Corporate responsibilities
- Human Resources, including Senior Executives and Labor Relations
- Legal Services
- Compliance Management
- Internal Auditing, Information Security, and Privacy
- Environmental Protection, Health, Safety, and Sustainability

Peter Tyroller

Regional responsibilities
Asia Pacific, India

Rolf Najork

Industrial Technology business sector
Digital Business Industrial Technology[2]

Division
- Drive and Control Technology

Subsidiary
- Robert Bosch Manufacturing Solutions GmbH

Business unit
- Bosch Connected Industry

Dr. Stefan Hartung

Mobility Solutions business sector
- Purchasing Direct Materials
- Quality Management
- Communications[2]
- Performance Program[3]
- Strategy[4]

Divisions
- Powertrain Solutions
- Electrical Drives
- Packaging Technology[5]

Dr. Dirk Hoheisel[6]
Harald Kroeger[7]

- Systems Engineering and Technical Strategy Mobility Solutions

Divisions
- Chassis Systems Control
- Car Multimedia
- Automotive Electronics
- Automotive Steering
- Bosch eBike Systems[8]

Business unit
- Two-Wheeler and Powersports

Dr. Markus Heyn

- Sales Original Equipment Mobility Solutions
- Marketing and Sales Mobility Solutions[9]
- Progressive Mobility Player Organization
- Digital Business Mobility Solutions[2]

Divisions
- Automotive Aftermarket
- Connected Mobility Solutions

Subsidiaries
- ETAS GmbH
- Bosch Engineering GmbH

Regional responsibilities
North America, South America

Uwe Raschke

Consumer Goods business sector

Division
- Power Tools

Subsidiary
- BSH Hausgeräte GmbH

Regional responsibilities
Western Europe, middle eastern Europe, Russia, Africa, Middle East

Dr. Christian Fischer

Energy and Building Technology business sector

- Bosch Performance Office[8]

Divisions
- Building Technologies
- Bosch Global Service Solutions
- Thermotechnology

Subsidiary
- Robert Bosch Smart Home GmbH

Presidents
of the divisions

Manfred Baden
Automotive Aftermarket

Dr. Steffen Berns
Car Multimedia

Henk Becker
Power Tools

Henning von Boxberg
Bosch Global Service Solutions

Claus Fleischer[8]
Bosch eBike Systems[8]

Dr. Uwe Gackstatter
Powertrain Solutions

Uwe Glock
Thermotechnology

Dr. Rainer Kallenbach[10]
Dr. Elmar Pritsch[4]
Connected Mobility Solutions

Dr. Stefan König[5]
Packaging Technology[5]

Harald Kroeger[6]
Klaus Mäder[7]
Automotive Electronics

Rolf Najork
Drive and Control Technology

Dr. Tanja Rückert
Building Technologies

Christian Sobottka
Automotive Steering

Gerhard Johannes Steiger[5]
Dr. Mathias Pillin[8]
Chassis Systems Control

Dr. Bernhard Straub
Electrical Drives

1. Until December 31, 2019: Bosch Software Innovations GmbH
2. From January 1, 2019
3. From June 1, 2019
4. From September 1, 2019
5. Until December 31, 2019
6. Until June 30, 2019
7. From July 1, 2019
8. From January 1, 2020
9. Until August 31, 2019: Strategy, Marketing, and Sales Mobility Solutions
10. Until August 31, 2019

Supervisory board **report**

“In view of the fundamental changes in our markets, our topmost priority is to safeguard the Bosch Group’s successful development over the long term.”

Ladies and gentlemen,

The Bosch Group is feeling the effects of the fundamental changes in its markets, at present especially in the automotive sector. In many different areas, these changes are a source of huge opportunities for the company. The challenge we face is to prepare the ground for these opportunities while also carrying out the restructuring we need at the same time.

As supervisory board members, we once again fulfilled our legal and regulatory obligations with the utmost care in 2019. Accordingly, we monitored the work of the board of management, and offered our advice relating to running the company, to developing Bosch Group strategy, and to individual matters affecting the company. We looked in depth at what measures need to be taken as a result of both the considerable drop in global automotive production and the fall in the proportion of diesel passenger cars. This included deliberations about the powertrain technology of the future – an area in which Bosch is pursuing a broad-based approach. Here, we considered further modifications to the combustion engine as well the prospects for battery-electrical powertrains and fuel cells. In addition, we examined the opportunities arising for Bosch as a result of artificial intelligence, the future of factory automation, and market opportunities in energy and building technology. The board of management has the supervisory board's full support in its aim to make energy supplies at all Bosch locations worldwide carbon neutral as early as 2020.

In addition, we looked in detail at business developments, the financial and capital expenditure plans, the modifications to our risk management system, and the company's internal control systems. The supervisory board kept itself informed of the internal investigations prompted by the software manipulation of diesel engine control units, as well as of the settlements reached with the authorities. We also concerned ourselves with the board of management's proposal to switch to a new auditor with effect from the 2020 business year. In addition, outside of board meetings, the chairman of the supervisory board was regularly informed by the chairman of the board of management about current developments and significant events in the company. For both us and the board of management, the highest priority is to safeguard the Bosch Group's successful and sustainable development over the long term, especially in view of the fundamental changes in our markets. In this endeavor, our consultations are open, conscientious, and constructive.

PricewaterhouseCoopers GmbH Wirtschaftsprüfungsgesellschaft audited and issued an unqualified audit opinion on the Robert Bosch GmbH annual financial statements, the Bosch Group consolidated financial statements, and the accompanying management reports as of and for the year ended December 31, 2019. They furnished all these reports with an unqualified audit opinion. The supervisory board discussed these documents at length and subjected them to its own examination; all members of the supervisory board had access to the auditor's reports. Moreover, the auditor met with the supervisory board to report on the main findings of the audit, which were then discussed in detail. After receiving the auditor's final report, the supervisory board raised no objections, concurred with the results of the audit, and approved the Robert Bosch GmbH annual financial statements and the Bosch Group consolidated financial statements. Following its own review, the supervisory board endorsed the board of management's proposal for the appropriation of net profit.

At the end of March 2020, the deputy chairman of the supervisory board and employee representative Hartwig Geisel will be retiring from his duties. The supervisory board would like to thank Mr. Geisel for all he has done. Preparations to find his successor are underway. The supervisory board would also like to thank the board of management and all Bosch Group associates for their hard work over the past year, for their continuing commitment to the company in such challenging times, and for their willingness to shoulder the burdens resulting from these challenges.

Stuttgart, March 2020
For the supervisory board

Franz Fehrenbach
Chairman

Supervisory board

Franz Fehrenbach
Stuttgart
Chairman
Managing partner of Robert Bosch Industrietreuhand KG
Former chairman of the board of management of Robert Bosch GmbH

Hartwig Geisel
Riederich
Deputy chairman
Member of the works council of the Feuerbach plant, and chairman of the central works council of the Mobility Solutions business sector as well as deputy chairman of the combined works council of Robert Bosch GmbH

Nadine Boguslawski
Stuttgart
Chief representative (managing director) of the Baden-Württemberg regional directorate of the trade union Industriegewerkschaft Metall

Dr. Christof Bosch
Königsdorf
Spokesperson for the Bosch family

Christian Brunkhorst
Mühltal
Representative of the chairman of Industriegewerkschaft Metall

Prof. Elgar Fleisch
St. Gallen
Professor of information and technology management at the University of St. Gallen and ETH Zürich

Klaus Friedrich
Würzburg
Chairman of the works council of Bosch Rexroth AG, Lohr am Main, and chairman of the central works council of Bosch Rexroth AG and member of the combined works council of Robert Bosch GmbH

Mario Gutmann
Bamberg
Chairman of the works council of the Bamberg plant, and member of the central works council of the Mobility Solutions business sector as well as chairman of the economic committee of the Mobility Solutions business sector

Jörg Hofmann
Frankfurt am Main
President of Industriegewerkschaft Metall, Frankfurt am Main

Prof. Lars G. Josefsson
Stockholm
(until March 31, 2019)
Former president and chief executive officer of Vattenfall AB

Prof. Michael Kaschke
Oberkochen
Chairman of the board of management of Carl Zeiss AG

Prof. Renate Köcher
Konstanz
Managing director, Allensbach Institute for Public Opinion Research

Martina Koederitz
New York
(from April 1, 2019)
General manager, Industrial Market US, IBM Corporation

Matthias Georg Madelung
Munich
Member of the board of trustees of Robert Bosch Stiftung GmbH

Kerstin Mai
Hildesheim
Chairwoman of the works council of Robert Bosch Car Multimedia GmbH, Hildesheim, and chairwoman of the combined works council of Robert Bosch GmbH

Dr. Wolfgang Malchow
Pliezhausen
Managing partner of Robert Bosch Industrietreuhand KG

Urs B. Rinderknecht
Zürich
(until March 29, 2019)
Former chief executive of UBS AG

Oliver Simon
Dunzweiler
Chairman of the works council of the Homburg plant, and member of the central works council of the Mobility Solutions business sector

Karin Solda
Filderstadt
Chairwoman of the works council at the Leinfelden-Echterdingen location and of the central works council of Robert Bosch Power Tools GmbH

Peter Spuhler
Weiningen
(from April 1, 2019)
Majority shareholder and president of the supervisory board of Stadler Rail AG

Dr. Richard Vogt
Willstätt
Vice president engineering, Electrical Drives division, and chairman of the executives committee of Robert Bosch GmbH as well as of the combined executives committee of the Bosch Group in Germany

Prof. Beatrice Weder di Mauro
Singapore
Research professor at INSEAD, Singapore, and professor of international economics, Graduate Institute of International and Development Studies, Geneva

Prof. Hermann Scholl
Stuttgart
Honorary chairman of the Bosch Group

Industrial trust and international advisory committee

Robert Bosch Industrietreuhand KG

GENERAL PARTNERS

Franz Fehrenbach
Stuttgart
Chairman of the shareholders' meeting

Dr. Wolfgang Malchow
Pliezhausen

LIMITED PARTNERS

Prof. Stefan Asenkerschbaumer
Stuttgart

Dr. Christof Bosch
Königsdorf

Dr. Volkmar Denner
Pfullingen

Prof. Elgar Fleisch
St. Gallen
(from April 1, 2019)

Prof. Lino Guzzella
Uster

Dr. Jürgen Hambrecht
Neustadt
(until March 31, 2019)

Prof. Lars G. Josefsson
Stockholm
(until March 31, 2019)

Prof. Renate Köcher
Konstanz

Urs B. Rinderknecht
Zürich
(until March 31, 2019)

Peter Spuhler
Weiningen
(from April 1, 2019)

Dr. Eberhard Veit
Göppingen
(from April 1, 2019)

Robert Bosch International Advisory Committee

Franz Fehrenbach
Stuttgart
Chairman

Stephen J. Hadley
Washington
(until December 31, 2019)

HRH Prince El Hassan bin Talal
Amman
(until December 31, 2019)

Prof. Ryozo Hayashi
Tokyo

Prof. Lars G. Josefsson
Stockholm
(from April 1, 2019)

Baba N. Kalyani
Pune

Pascal Lamy
Paris

Friedrich Merz
Arnsberg

Prof. Volker Perthes
Berlin

Ingo Plöger
São Paulo

Paul Ryan
Janesville
(from January 1, 2020)

Jing Ulrich
Hong Kong

Prof. Igor Yurgens
Moscow

Highlights
2019

Jan. 7 Las Vegas, USA
World premiere of concept shuttle vehicle
At CES, Bosch presents a concept vehicle featuring a unique package of hardware, software, and mobility services for the urban mobility of the future.

Jan. 7 Stuttgart, Germany, and Las Vegas, USA
#LikeABosch launched
This offbeat IoT image campaign positions Bosch as a global IoT player.

Jan. 24 Stuttgart, Germany
Acquisition of EM-motive announced
Set up jointly with Daimler in 2011, EM-motive GmbH is now one of the most successful European manufacturers of electric motors for hydrids and electric cars.

Feb. 6 Chennai, India
Robert Bosch Center for Data Science and Artificial Intelligence opens
Located on the campus of the Indian Institute of Technology Madras (IITM), the new center will conduct basic research.

01

02

Mar. 27 Hannover, Germany
Bosch presents factory of the future
Hannover Trade Fair: Autonomous transport vehicles deliver components to digital workspaces, robotics solutions support workers in manufacturing, and quality inspection is performed with the help of artificial intelligence.

Apr. 29 Stuttgart, Germany
Alliance with PowerCell made public
Bosch is entering the market for mobile fuel cells and preparing for the breakthrough of this technology for trucks and cars.

04

May 9 Stuttgart and Rennigen, Germany
Bosch announces move to carbon neutrality
From 2020, Bosch will be the first major industrial enterprise whose locations' energy needs no longer leave a carbon footprint.

05

Feb. 24 Karlsruhe, Germany
Bosch debuts AR applications for HoloLens 2
In a strategic alliance, Bosch will be one of the first companies worldwide to use and test Microsoft's augmented reality glasses.

Mar. 11 London, United Kingdom
London Connectory opens
In this new co-innovation space, Bosch will be working with Nitrous, a platform that promotes public-private projects to identify smart mobility solutions for London.

03

Mar. 21 Leinfelden-Echterdingen, Germany
New performance dimension for pros
With its Biturbo tools, Bosch is taking performance to a new level: for the first time, cordless tools have outstripped corded ones.

Mar. 21 Nanjing, China
First iBooster plant in Asia Pacific opens
Total investment in the plant for electromechanical brake boosters comes to 100 million euros.

May 15 Berlin, Germany
Bosch ConnectedWorld 2019
Under the tagline “From the internet of things to the economy of things,” Bosch offers roughly 5,000 delegates a glimpse into the future, when things will not only be digitally connected with each other, but will also do business with one another.

June 18 Stuttgart and Ludwigsburg, Germany
10 years of Bosch eBike Systems
Bosch has set the benchmark for pedelec drives and, together with its partners and customers, decisively shaped the e-bike market.

06

July 17 Grasbrunn, Germany
Bosch announces acquisition of GFR
With a workforce of 260, GFR-Gesellschaft für Regelungstechnik und Energieeinsparung mbH provides building automation solutions that improve security, comfort, convenience, and efficiency in commercial buildings.

07

July 23 Stuttgart, Germany
Automated valet parking celebrates world premiere
Bosch and Daimler obtain first ever official approval for driverless parking without human oversight – in the parking garage of the Mercedes-Benz Museum.

08

Oct. 29 Renningen, Germany
Bosch confers Young Researcher Award
Dr. Gergely Neu, who teaches at Barcelona’s Pompeu Fabra University, receives the 50,000-euro award for his basic research into reinforcement learning, a branch of artificial intelligence.

Nov. 21 Stuttgart, Germany
Bosch applies for 5G licenses
In collaboration with selected partners, Bosch intends to set up local 5G networks in order to exploit the potential of Industry 4.0 even better.

Nov. 29 Wuxi, China
Groundbreaking ceremony for fuel-cell center
The new center is intended to reinforce research and development and help serve the Chinese market faster and more flexibly.

11

Aug. 12 Hildesheim, Germany
Bosch presents groundbreaking 3D vehicle display
With no need for additional technology, these new products generate a realistic three-dimensional effect that allows information to be grasped faster than on conventional displays.

Sep. 4 Berlin, Germany
BSH Hausgeräte debuts Cookit
Bosch uses the IFA trade show to launch its first digitally connected multifunctional food processor that also cooks.

Sep. 5 Stuttgart, Germany
Bosch and CATL agree to collaborate on battery cells
Contemporary Amperex Technology Co. Limited (CATL) will design, develop, and manufacture battery cells for the 48-volt battery Bosch has developed for hybrid powertrains.

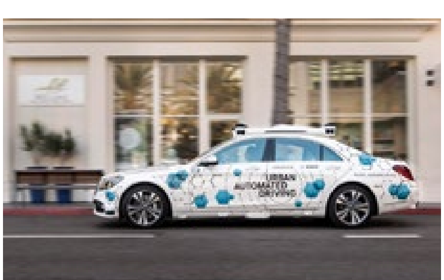
09

Sep. 10 Frankfurt, Germany
Bosch at IAA 2019
Bosch presents new mobility solutions such as its rolling chassis study for electric cars – a ready-to-drive modular platform that serves as a flexible basis for various bodywork designs, such as shuttles – and cloud-based battery services that help prolong vehicle batteries' service life.

10

Oct. 8 Reutlingen, Germany
Technological leap in electromobility announced
Bosch's new silicon carbide semiconductors mean more power for electric motors and 6 percent greater range.

12



Dec. 9 San José, USA, and Stuttgart, Germany
Pilot automated ridesharing service launches
Together with the city of San José, Bosch and Mercedes-Benz start an app-based ridesharing service using automated Mercedes-Benz S-Class vehicles.

Dec. 10 Bengaluru, India
Bosch starts eCall service in India
This countrywide service in Hindi and English provides swift help to drivers in an emergency.

Robert Bosch Stiftung

Since it was established in 1964, Robert Bosch Stiftung GmbH has been carrying on the company founder's public welfare endeavors. It devotes itself to social challenges and promotes projects whose aim is to develop innovative models for our future. The Stiftung finances its work from the dividend it receives as a shareholder in Robert Bosch GmbH. Robert Bosch Stiftung is active in the areas of healthcare, science, education, civic society, and international relations and cooperation.

Stiftung focuses its work on ten new topics

Last year, the Stiftung gave its portfolio a facelift. In the future, it will be narrowing its focus. Following a proposal by the board of management, the board of trustees approved ten new topics. With this strategic realignment, the Stiftung wants to adapt its work to current social challenges and at the same time improve the effectiveness of its funding.

For better healthcare

In the healthcare field, it will in the future focus its attention on "people in the healthcare system" and "viable healthcare systems." Its aims are two-fold. First, it wants to give healthcare professionals the resources they need to act as competently as possible given the challenges their sector faces. Second, it wants to consider viable models of healthcare and ways of improving the basic conditions in which healthcare systems operate.

At the start of 2019, Robert Bosch Stiftung decided to set up a Bosch Health Campus. The center for patient-oriented, state-of-the-art medical care will focus on treatment, research, and training. Construction work on the site of the Robert Bosch Hospital in Stuttgart will be completed by 2025. By bringing various specialties together, the campus will offer comprehensive interdisciplinary care under one roof. The Stiftung is making some 250 million euros available for building and equipping the Bosch Health Campus. In the years up to 2025, a further 120 million euros will flow into medical research there. This is therefore the biggest single investment the Stiftung has ever made.

Total project grants 2019
Figures in millions of euros

104.99

26.92	International relations and cooperation (aggregated)
15.85	Capital expenditure for the Robert Bosch Hospital
13.39	Research at institutes and the Robert Bosch Hospital
8.52	Society
8.51	Education
7.18	Healthcare
7.18	Science
4.44	Die Deutsche Schulakademie gGmbH
1.80	Robert Bosch College UWC GmbH
1.66	International Alumni Center gGmbH
9.54	Other grants

A simple plastic tube – filled with reeds and bamboo canes – acts as a research tool: in a multi-year project with the University of Freiburg, students from the UWC Robert Bosch College analyze roughly 300 insect houses that have been set up at schools across Germany. The study is aimed at discovering what factors affect the spread of insect populations.

Commitment in education and science

The future focus of the Stiftung's support for education will be on "learning by organizations" and "learning by individuals." It wants to provide support for educational organizations as they evolve into learning organizations, so that they can fulfill their mission to educate all young people in the best possible way. With respect to individuals, the Stiftung will be supporting approaches and models for new forms of knowledge acquisition.

In the science field, the Stiftung will be working to give science firm roots in all sections of society and to create as many touchpoints as possible between science and the general public. Work on developing the details of the Stiftung's strategy in this field will continue up to the summer of 2020.

Strengthen democracy and shape coexistence

Civic society is a new area of work for the Stiftung. Within this field, it will be focusing on "democracy" and "ethnic diversity in society." It will be aiming to support efforts to teach democratic competence and new forms of civic engagement. In the field of ethnic diversity, funding will focus on efforts to improve coexistence among all social groupings in Germany.

Global social challenges

In its work to promote international relations and cooperation, the Stiftung will devote itself to four new topics. "Conflicts," the first of these, will look into ways of taking early action to prevent violence from reoccurring and of improving the chances of lasting peace. The sustainable use of resources and the resilience of ecological, social, and economic systems will be the focus of work in the area of "climate change."

The Stiftung's work in the "migration" field will concentrate on developing approaches to global migration that are geared to the long term and to upholding human dignity. In the area of "inequality," the Stiftung will especially address systemic, or widely perpetuated, inequality and look for ways of reducing it.

International prospects for Germany and Europe

In June 2019, the Robert Bosch Academy celebrated its fifth anniversary. Set up by the Stiftung in Berlin, the academy has made a name for itself as a place in which questions of global significance can be addressed from an international perspective. Some 70 renowned experts from 34 countries have so far participated in residency programs at the academy, and enriched debate in Germany and Europe with their insights. In the future, the Stiftung will aim to use its grants to exploit this potential even better. In this context, it will further extend its collaboration with think tanks.

The UWC Robert Bosch College also celebrated its fifth anniversary in 2019. The students attending this exceptional school – which is open to pupils in the two final years of their secondary education – come from more than 100 countries. They board in what was once a Carthusian monastery in Freiburg, Germany. Since the school opened, some 400 young people have successfully completed the globally recognized international baccalaureate exam and taken the benefits of their experience in this cosmopolitan setting out into the wider world.

The following institutions also belong to the Stiftung:
- Robert Bosch Hospital
- Dr. Margarete Fischer-Bosch Institute for Clinical Pharmacology
- Institute for the History of Medicine of the Robert Bosch Stiftung
- Die Deutsche Schulakademie
- UWC Robert Bosch College
- Robert Bosch Centrum für Tumorerkrankungen
- International Alumni Center iac Berlin

Dependent foundations within the Stiftung:
- Otto und Edith Mühlschlegel Stiftung (aging)
- Hans-Walz-Stiftung (research into complementary medicine)
- DVA-Stiftung (Franco-German dialogue)

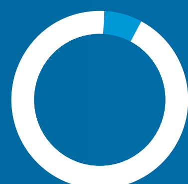
Group management report

Bosch Group

01 Shareholders of Robert Bosch GmbH

Shareholding

1% Robert Bosch GmbH
7% Bosch family
92% Robert Bosch Stiftung GmbH



Voting rights

7% Bosch family
93% Robert Bosch Industrietreuhand KG

The Bosch Group is experiencing fundamental changes in its markets. These changes will open up major opportunities in the medium and long term. Objectives and strategies have been defined in order to exploit these opportunities. At the same time, these changes present far-reaching challenges. This is especially true right now for the automotive sector. In 2019, the company also felt the effect of the cooling global economy and the marked fall in global automotive production. Nonetheless, the success of many products kept the Bosch Group’s sales virtually on a par with the previous year. The development of earnings proved less favorable. This was chiefly due to three factors. First, upfront investments in technologies with future potential such as electromobility, automated driving, artificial intelligence, and the internet of things (IoT) continued to grow. Second, there was the weakness of automotive markets such as China and India, which had previously generated high margins, and of the diesel passenger car market segment. Finally, this meant significant expenses for necessary restructuring measures, especially in the Mobility Solutions business sector. An important strategic step toward a more focused portfolio was taken with the divestment of the former Packaging Technology division. The proceeds from the sale had a positive effect on earnings in 2019. The 2020 business year is expected to bring a further cooldown in key markets and, in particular, a continued fall in global automotive production. In addition, there are the possible effects of the coronavirus outbreak, whose global impact cannot yet be foreseen. In our plans so far for 2020, we are assuming Bosch Group sales will be slightly below their previous-year level. Moreover, we have introduced comprehensive measures to help us return to the margins of previous years in the medium term. However, we also expect the 2020 result to be considerably burdened by upfront investments and adjustment measures. Bosch will also focus on issues of central future importance, including climate action: as early as 2020, power supplies to Bosch Group locations worldwide will be CO_2 neutral.

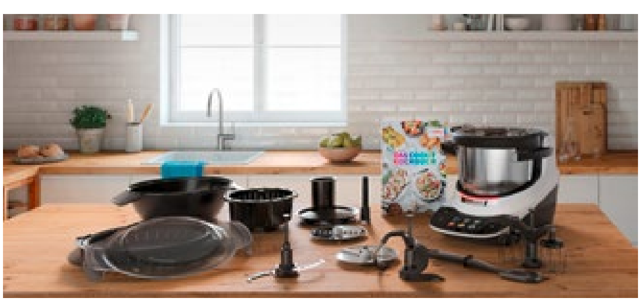
02 BUSINESS SECTORS

Mobility Solutions

Powertrain Solutions
Chassis Systems Control
Electrical Drives
Car Multimedia
Automotive Electronics
Automotive Aftermarket
Automotive Steering
Connected Mobility Solutions
Bosch eBike Systems[1]

Industrial Technology

Packaging Technology[2]
Drive and Control Technology[3]



Consumer Goods

Power Tools[4]
BSH Hausgeräte GmbH

Energy and Building Technology

Building Technologies
Thermotechnology
Bosch Global Service Solutions

1. New division from January 1, 2020
2. Until December 31, 2019: Robert Bosch Packaging Technology GmbH
3. Bosch Rexroth AG (100% Bosch-owned)
4. Robert Bosch Power Tools GmbH

Fundamental information about the group

The group

The Bosch Group is a global supplier of technology and services, and generates nearly half its sales outside Europe. It encompasses around 440 fully consolidated subsidiaries and regional companies in more than 60 countries. The parent company is Robert Bosch GmbH, which is headquartered in Stuttgart, Germany. It started out as "Workshop for Precision Mechanics and Electrical Engineering," founded in Stuttgart in 1886 by Robert Bosch (1861–1942). In 1917, the company changed its legal form into that of a stock corporation (Aktiengesellschaft); in 1937, it reorganized as a close corporation, Robert Bosch GmbH. Robert Bosch Stiftung GmbH has been the majority shareholder in Robert Bosch GmbH since 1964.

As a not-for-profit foundation, the Robert Bosch Stiftung has no influence on the strategic or business orientation of the Bosch Group. The voting rights accruing to its share are held by Robert Bosch Industrietreuhand KG, an industrial trust, which performs the entrepreneurial ownership functions. The trust itself owns a capital share of 0.01 percent. Most of the remaining shares and voting rights are held by the founder's descendants. This ownership structure guarantees the Bosch Group's entrepreneurial independence and allows it to plan for the long term.

Organization and competitive environment

With some 398,200 associates worldwide, the Bosch Group's overriding objective is to develop and bring to market solutions that are "Invented for life." It is divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. Reporting is segmented in the same way. All four business sectors are facing increasingly intense competition. This includes competitors from China and various emerging markets. Moreover, the IoT is changing the competitive environment in all areas by opening the door to new competitors from the IT and internet domain as well as the service sector, some of which are using new business models. The Bosch Group itself is also offering an increasing number of connected solutions and services, and developing suitable business models for this purpose. Despite these general trends, the business sectors' markets and competitive environments vary, in some cases significantly so.

In the case of Mobility Solutions, the Bosch Group has for a long time competed mainly with a small number of major automotive suppliers. Its chief customers have been globally operating automakers and large regional producers, such as in China. However, this market is changing due to increasing electrification, automation, connectivity, and multimodal mobility. As a result, additional suppliers – as well as providers of mobility platforms – are now entering the market from industries including consumer electronics, semiconductors, and the services and internet sector. In view of changing needs and substantial upfront investments, the company's divisions are required to cooperate more closely or enter into external partnerships. Traditional manufacturers and suppliers can also expect to see a continued trend toward consolidation. Cities, towns, and local authorities are exerting a growing influence on mobility concepts.

Within Industrial Technology, the Drive and Control Technology division supplies hydraulics and factory automation components and systems in fairly fragmented markets with many competitors and customers. The nature of these competitors and customers is also changing as a result of trends such as electrification and the inroads being made by digital solutions.

In the Consumer Goods business sector, Power Tools and BSH Hausgeräte largely market their products directly to end consumers. These divisions face intense competition from both global and regional providers. In Europe and China, two important markets for Power Tools and BSH Hausgeräte, the commercial landscape is changing as a result of increasing consolidation in brick-and-mortar commerce and the growing importance of online commerce.

In Energy and Building Technology, the Building Technologies and Thermotechnology divisions compete with a small number of international and many regional providers. In the Building Technologies division, competition from Chinese providers is becoming increasingly fierce, while the different sectors involved in energy and building technology are converging. The Bosch Global Service Solutions division competes with both large international rivals and smaller local providers in the fragmented business services market.

Corporate governance

The board of management of Robert Bosch GmbH defines the strategy for the entire company and leads the company as a whole. Its responsibilities are set out in the board of management organization chart. The Robert Bosch GmbH supervisory board appoints, monitors, and advises the board of management. In making appointments to the supervisory board, Robert Bosch GmbH is subject to the German "Mitbestimmungsgesetz" (Codetermination Act). In view of the company's size, the supervisory board has 20 members. Ten members are appointed by the shareholders with voting rights. The other ten members are elected by the employee representatives. The industrial trust Robert Bosch Industrietreuhand KG acts as managing partner. In line with the mission handed down in the will of the company's founder, Robert Bosch, the trust is responsible for safeguarding the company's long-term existence and, above all, its financial independence. The aim is to guarantee that the company remains independent and able to act at all times.

Owing to German legal requirements, Bosch has also been obliged to set targets for the percentage of women members of the supervisory board and board of management. The current deadline is December 31, 2021. The current targets are 20 percent for the supervisory board of Robert Bosch GmbH, and 10 percent for the board of management of Robert Bosch GmbH. Other targets for Germany for the end of 2021 are 8 percent for the level below the board of management (first management level) and 12 percent for the second management level. At the end of 2019, 8.4 percent had been reached for the first management level (previous year 7.6 percent), while for the second management level the figure was 12.1 percent (previous year 11.2 percent). Globally, the proportion of women executives across all management levels within the group rose to 17.2 percent (previous year 16.6 percent). We intend to keep on increasing this percentage, with a medium-term target of 20 percent.

Business sectors

Mobility Solutions business sector

As an automotive supplier, Bosch is engaged in a very wide range of activities, which are organized into six divisions. The business sector also includes the Automotive Aftermarket division, the service provider Connected Mobility Solutions, the new Bosch eBike Systems division, which was created at the start of 2020, and activities involving two-wheelers, commercial and off-highway vehicles, and engineering services.

Powertrain Solutions

The Powertrain Solutions division offers solutions for powertrains running on all kinds of fuel, and is organized into three segments: passenger cars, commercial and off-highway vehicles, and electric vehicles. It offers comprehensive products and solutions for powertrain technology, from gasoline and diesel direct injection to electrified powertrains with battery systems. In the future, it will offer fuel-cell technologies as well.

Where combustion engines are concerned, Powertrain Solutions is pushing ahead with the further development of innovative, eco-friendly technologies and systems based on diesel, gasoline, natural gas, ethanol, and synthetic fuels. They include engine management systems, fuel supply modules, fuel injectors and pumps, and ignition systems. For diesel systems, the division is developing even more fuel-efficient and eco-friendly injection systems for applications ranging from passenger cars and commercial vehicles of all kinds to industrial power-generation units.

In the area of electromobility, Bosch offers solutions for all vehicle types, from motorized two-wheelers to commercial vehicles. The range includes components and systems for gasoline and diesel hybrid vehicles as well as for purely electric vehicles. In the future, it will also encompass vehicles with fuel-cell powertrains. Products range from electric motors, power electronics, battery systems such as our 48-volt battery, battery management systems, and transmission technology to complete e-axles, a compact unit including electric motor, power electronics, and transmission.

Chassis Systems Control
Chassis Systems Control develops and manufactures components, functions, and systems that enable safe, relaxed, dynamic, and, increasingly, automated driving. These include brake actuation products such as vacuum-based and electromechanical brake boosters, as well as brake discs. ABS, TCS, and ESP® electronic braking control systems are an important area of activity. The division also supplies sensors such as speed, steering-angle, and yaw-rate sensors, as well as electronic devices to protect occupants and pedestrians, such as airbag control units and crash sensors. A fast-growing area is that of driver assistance systems. These are based on ultrasonic, radar, and video sensors developed and manufactured by Bosch itself, and will be complemented in the future by LiDAR sensors as well. These enable functions such as ACC adaptive cruise control, predictive emergency braking systems, lane-keeping systems, and parking assistants. These driver assistance systems will ultimately result in partially and highly automated solutions.

Electrical Drives
The Electrical Drives division offers a wide range of electromechanical components and systems. They include motors and drive systems for convenience features such as window lifters, seat adjustment, and sunroofs, powerful servomotors for ABS and ESP®, applications for powertrain electrification, as well as wiper systems including wiper blades. There is also a comprehensive range of products for engine thermal management, including engine cooling modules, pumps, valves for cooling systems, and air-conditioning fan components. Drives and systems, also for e-bikes and e-scooters, complete the portfolio.

Car Multimedia
Car Multimedia develops and supplies electronic systems that function as interfaces between people and their vehicles. Its portfolio comprises infotainment, display, connectivity, interior-sensor, and user-personalization solutions for passenger cars, commercial vehicles, buses, two-wheelers, and off-highway vehicles. Convergent cockpit computers are steadily closing the gap between driver information, infotainment, and communication systems. As well as complete systems and hardware solutions, the division also increasingly offers connected software solutions.

Automotive Electronics
Automotive Electronics develops and manufactures semiconductors, sensors, and control units for systems including body electronics, braking control, and engine management. Its semiconductors for automotive applications range from application-specific integrated circuits (ASICs) through to power semiconductors and MEMS (microelectromechanical systems) sensors. This division will be given overall responsibility for automotive electronics manufacturing in the future. In the IoT domain, Automotive Electronics includes the subsidiary Bosch Connected Devices and Solutions GmbH, based in Reutlingen, Germany. In entertainment electronics, Bosch Sensortec GmbH, Kusterdingen, Germany, supplies MEMS sensors for a diverse range of applications.

Automotive Aftermarket
The Automotive Aftermarket division provides the aftermarket and repair shops worldwide with a complete range of technology and solutions related to auto diagnosis and repairs, as well as a wide range of spare parts for vehicles – from new and remanufactured exchange parts to repair solutions. The portfolio consists of Bosch original-equipment products, as well as specific aftermarket products and services developed and manufactured in-house or sourced externally. In addition, the division provides testing and repair-shop technology, diagnostics software, service training, and technical information and services. It is also responsible for the concept behind the independent repair-shop franchises Bosch Car Service and AutoCrew.

Automotive Steering
Automotive Steering develops, manufactures, and sells steering systems, steering columns, and steering and gear pumps for passenger cars and commercial vehicles. The product portfolio in the passenger car unit includes the fuel-saving Servolectric® electric power steering system and, for commercial vehicles, the Servotwin® electrohydraulic steering system as well as rear-axle steering systems.

Connected Mobility Solutions
The Connected Mobility Solutions division develops mobility solutions and services. Its goal is to offer connected solutions from a single source and to further develop the company's platform for connected mobility solutions, the Mobility Cloud. The division is focusing increasingly on services for mobility service providers, both within and outside the traditional automotive sector.

Bosch eBike Systems
The former Bosch eBike Systems business unit, previously part of the Automotive Electronics division, was made a division in its own right at the start of 2020. Its range spans complete drive systems with batteries, control units offering connectivity and digital solutions, an ABS for e-bikes, and services for specialist bike dealers.

Other businesses
The Two-Wheeler and Powersports unit offers assistance systems such as ABS, MSC motorcycle stability control, and ESP®, as well as fuel-saving and electrified powertrain technology, display instruments, and connectivity solutions for two-wheelers, three-wheelers, and powersports vehicles. Its range of assistance systems also now includes radar-based systems such as ACC adaptive cruise control. The cross-divisional unit can draw on the global resources of the Mobility Solutions business sector.

The subsidiary Bosch Engineering GmbH, based in Abstatt, Germany, develops a wide range of customized solutions based on tried and tested technology used in large-scale production. For example, it provides solutions for sports cars and off-highway vehicles, but also for railcars and other non-automotive applications. Bosch's motor racing activities are also based there.

Bosch Engineering also houses the Commercial Vehicles and Off-Road unit, which holds cross-divisional responsibility for systems development, product management, and sales for the commercial and off-highway vehicle segment. The unit is also working on solutions for self-driving trucks and digitalized agriculture.

In addition to the services offered by Bosch Engineering, ITK Engineering GmbH, headquartered in Rülzheim, Germany, offers customized and bespoke systems- and software-development services under its own brand, with engineering operations separate from Bosch.

The Bosch companies that form ETAS GmbH, based in Stuttgart, Germany, provide solutions for embedded software systems that are used in the automotive and other industries. The ETAS subsidiary ESCRYPT GmbH, based in Bochum, Germany, develops cybersecurity solutions.

Industrial Technology business sector

Following the sale of Packaging Technology, the business sector comprises the Drive and Control Technology division, the Robert Bosch Manufacturing Solutions business unit, which primarily provides in-house assembly services, and the Bosch Connected Industry business unit.

Drive and Control Technology
Our Bosch Rexroth AG subsidiary specializes in drive and control technologies for efficient, powerful, and safe movement in machines and systems of any type and size. The company combines global application experience in the market segments of mobile applications, plant construction and engineering, and factory automation. With intelligent components, customized system solutions, and services, Bosch Rexroth creates the necessary environment for fully connected applications. The division offers its customers hydraulics, electric drives and controls, gear technology, and linear motion and assembly technology, including software and interfaces to the IoT.

Other businesses
Bosch's in-house provider of assembly systems, the business unit Robert Bosch Manufacturing Solutions GmbH, based in Stuttgart, Germany, develops flexible, scalable plans for assembly systems, customized solutions in the field of testing and process technology, and related services. In addition, with a focus on Industry 4.0, the business sector's Bosch Connected Industry business unit develops software solutions and carries out projects for internal and external customers.

Consumer Goods business sector

The business sector comprises two divisions.

Power Tools
Robert Bosch Power Tools GmbH is a supplier of power tools, power-tool accessories, and measuring technology. The division has an extensive product range aimed at professional users in trade and industry, the DIY market, and amateur crafters. The range includes power tools and garden tools. One of the division's focal points is convenient, high-performance cordless tools, and increasingly also web-enabled tools and services. The wide range of accessories includes abrasive systems, drill bits, and saw blades. Precision power tools and 3D printers for DIY users and amateur crafters are sold under the Dremel brand.

BSH Hausgeräte GmbH
The household-appliance manufacturer BSH Hausgeräte GmbH has a product portfolio that ranges from washing machines and tumble dryers through refrigerators and freezers, stoves, ovens, extractor hoods, and dishwashers, to small appliances such as vacuum cleaners, coffee makers, and food processors. The household-appliance specialist sells its products under the global Bosch and Siemens brands under license. It also sells under the Gaggenau and Neff brands, as well as local brands such as Balay in Spain and Thermador in the United States. These are complemented by Home Connect, a brand for the BSH digital ecosystem on the IoT, together with service brands such as the food platform Kitchen Stories.

Energy and Building Technology business sector

As well as the Building Technologies, Thermotechnology, and Bosch Global Service Solutions divisions, the business sector includes the Robert Bosch Smart Home GmbH unit.

Building Technologies
The Building Technologies division has two areas of business: the global product business for security and communications solutions, and the regional system integration business. The latter offers solutions and customized services for building security, energy efficiency, and building automation in selected countries. Both units focus on commercial buildings and infrastructure projects. The product portfolio encompasses video-surveillance, intrusion-detection, fire-detection, and voice-alarm systems, as well as access-control and professional audio and conference systems.

Thermotechnology
Thermotechnology offers solutions for air conditioning, hot water, and decentralized energy management to customers worldwide. Its areas of business are heating systems and energy management for residential buildings, water heaters, and commercial and industrial heating and air-conditioning systems. The portfolio includes highly efficient technologies such as condensing boilers, solar thermal systems, heat pumps, and combined heat and power generation. The division's products are sold under international and regional brand names such as Bosch, Buderus, and Worcester. Web-enabled devices are becoming more and more important, not least because of the scope for remote diagnosis they offer.

Bosch Global Service Solutions
The Bosch Global Service Solutions division provides business processes and services, primarily for customers in the automotive, travel, and logistics industries and in information and communications technology.

Robert Bosch Smart Home GmbH
Robert Bosch Smart Home GmbH, Stuttgart, Germany, offers web-enabled, app-controlled products for the home. They include solutions for controlling processes such as the operation of heating, air conditioning, lighting, and shutters, as well as automated room monitoring using interior cameras and fire and motion detectors.

Companies not allocated to business sectors
The Bosch Group's global software and systems unit, Bosch Software Innovations GmbH, based in Berlin, Germany, was renamed Bosch.IO at the start of 2020 and given responsibility for other Bosch activities in the IoT domain. Bosch.IO helps the operating units to develop scalable solutions and digital business models. It is also responsible for IoT activities relating to agriculture, commercial buildings, and energy, as well as external sales of the Bosch IoT Suite, including in combination with Bosch's hybrid cloud solutions.

The subsidiary Bosch Healthcare Solutions GmbH, based in Waiblingen, Germany, operates in the medical technology sector, supplying sensors, software, and services. In addition to equipment for therapy management and laboratory diagnostics, the product range includes ceramic components for surgical instruments.

The subsidiary grow platform GmbH, based in Ludwigsburg, Germany (postal address), offers a platform within the Bosch Group for developing and implementing new business models and incubating new startups. A network provides internal startups with access to Bosch's resources and expertise and supports them with business know-how in areas such as controlling, HR, infrastructure, marketing, and methods.

Through Robert Bosch Venture Capital GmbH, based in Gerlingen, Germany, we invest worldwide in technologies with future potential, such as the IoT, artificial intelligence, and automated driving. The company provides capital for startups and industry-specific venture capital funds in Europe, the U.S., Israel, and China.

Prospects for the Bosch Group

Fundamental direction

The starting point for our goals and strategies is the objective of securing the company's future as enshrined in the will of the company's founder Robert Bosch – in other words, ensuring the company's strong development and securing its financial independence. We want to become a leading provider on the IoT and for the mobility of the future.

Our ambition is to develop products that are "Invented for life," that fascinate, that improve quality of life, and that help conserve natural resources. In this respect, "products" are not only physical products and services, but also the software-based solutions that go with them. We are driving forward innovations in both products and business models, entering new business fields, and modifying our organization.

The Bosch Group is currently experiencing a phase of fundamental change in technologies and markets. Besides digitalization and increased connectivity via the IoT, this is also due to growing global concern about climate change, geopolitical developments, and social trends such as increasing urbanization. Connectivity is affecting all our areas of business, from mobility solutions, industrial technology, and consumer goods such as household appliances and power tools, through to building and energy technology. Increasing electrification is also revolutionizing our business, especially in automotive technology, but also in industrial technology and energy and building technology.

As affirmed in our "We are Bosch" mission statement, one of our strategic focal points is shaping change, taking into account the aspects of connectivity, electrification, automation, energy efficiency, and emerging markets. It is our ambition to play a part in molding the far-reaching changes in markets and technology. Apart from shaping change, our strategic focal points are customer focus and excellence.

Customer focus means having a precise understanding of customers' needs and using this understanding to find the best possible solutions for products and business models. Excellence in all areas is essential in order to achieve our targets over the long term. We measure ourselves against our best competitors and aim to achieve leading positions in each case. We want efficient processes, lean structures, and high productivity to help us maintain and increase the value of our company. A business environment that is changing at an ever faster pace also calls for a high degree of adaptability and greater agility. To achieve this, we are constantly reappraising our understanding of leadership, collaboration, organization, and communication, as well as the models based on these concepts.

When putting our strategy into practice, we build on our strengths: the Bosch culture, our high level of innovation and quality, and our broad global presence. Our actions are based on the Bosch values: future and result focus, responsibility and sustainability, initiative and determination, openness and trust, fairness, reliability and credibility, legality, and diversity.

A wealth of opportunities

Changes in markets and technology are opening up a wealth of opportunities for growth in the Bosch Group, particularly with regard to increasing connectivity. More and more products can be inexpensively connected to the internet and equipped with increasing levels of intelligence. In view of our expertise in many product areas, in software and sensor technology, also as a supplier of MEMS sensors, we believe this offers Bosch huge opportunities. We are also significantly enhancing our proficiency in the field of artificial intelligence, as we see considerable potential in the design of intelligent, user-friendly products and processes.

In addition to the Industrial Technology and Energy and Building Technology business sectors, automation also affects the Mobility Solutions business sector in particular. As road traffic density continues to grow, for instance, partially and highly automated driving can help reduce the number of accidents and improve traffic flow. Connected services and business models promise flexible and convenient mobility.

Where industrial technology is concerned, many opportunities arise from the increasing flexibility of production combined with more widespread connectivity. This opens up new ways of enhancing product quality and productivity, as well as of adding functionality, improving resource conservation, and better protecting workers' health and safety. It also opens up potential for new services. In the Consumer Goods and Energy and Building Technology business sectors as well, connectivity and increasingly smart products are creating additional potential for growth through new services and business models.

Electrification is of particular importance for Mobility Solutions, our biggest business sector. The key drivers for electrification and electromobility are emissions standards aimed at complying with climate action targets and improving air quality in cities, as well as falling battery costs. The driving enjoyment offered by electric vehicles is also a contributing factor. Electrification is also playing an increasing role in industrial and building technology. We aim to increase energy efficiency both in our products and at our own locations.

The emerging markets of Asia, South America, central and eastern Europe, and Africa are home to the majority of the world's population, with a high demand for goods and services. We are continuing to expand our presence in these regions. There is demand for affordable products that often have to meet special requirements of the local market, such as robustness and ease of repair.

Business goals and improving earnings

Our goal is profitable growth. Given the fundamental changes in the market and competitive environment, and also to curb growing complexity, this will also require adjustments to our portfolio. We still want to grow more rapidly than the market in Europe, increase our sales in Asia Pacific and the Americas faster than in Europe, and become better established in Africa. In terms of the sales generated by our business sectors, we are aiming for a balance between Mobility Solutions and our other business sectors. We intend to grow both by innovating and by acquiring companies and entering into partnerships. For the Bosch Group, it remains our target to achieve an EBIT margin from operations of some 7 percent, a level to which we want to return in the medium term. This target margin from operations is calculated on the basis of benchmark comparisons from the operating units, taking particular account of the upfront investments needed for growth and enabling projects. The target margin is reviewed regularly in light of the current portfolio. The negative effects on earnings from increased depreciation and amortization as a consequence of the complete takeover of the former joint ventures Automotive Steering and BSH Hausgeräte are not taken into account in the target margin from operations.

Extensive measures are intended to help restore profitability to the levels seen in previous years. At group level, they include the ongoing realignment of headquarters and the creation of the Global Business Services corporate unit, budget adjustments in the corporate units, and more focus in our growth and enabling projects. A freeze on basic pay for all executives worldwide has also been agreed for 2020, with the only exceptions being in high-inflation countries or to comply with statutory requirements. This step is a further contribution by executives in addition to the significant cut in their bonuses.

To increase competitiveness, all units are required to focus squarely on target cost structures. For instance, the divisions have been given the task of measuring themselves against benchmarks in the most important cost categories, and of formulating and implementing measures to improve their long-term competitiveness. The rigorous implementation of these measures is to be supported by the newly created function of Chief Performance Officer on the board of management. Mobility Solutions has also launched a performance program across the entire business sector, with a raft of measures that will also result in alterations to the portfolio, restructuring measures, and personnel adjustments. How they will be implemented in practice will depend on the individual requirements in the operating units and regions.

Strategy and innovation

Leading position in the internet of things

Our goal is to become one of the world's leading internet of things (IoT) companies. The IoT is facilitating innovative, connected products and opening up additional business opportunities in digital services. The goal is to use connected, intelligent solutions to make life easier, more efficient, and safer for as many people as possible. We regard our presence in diverse markets and industries as an advantage, because of the many insights we gain as a result.

With the IoT in our sights, we have been expanding our expertise in the areas of software development and product connectivity for some time now. We now have our own IoT platform (the Bosch IoT Suite) and IoT cloud (the Bosch IoT Cloud), and follow an open-source hybrid cloud strategy. In other words, we work with many providers and partners. We have also set up the option of single sign-on, which means that Bosch users only need to log in once for services across all divisions. In addition, we are making an ever-increasing number of Bosch electronic products web-enabled, and our business sectors are developing a wide range of connectivity solutions based on these connected products. They range from mobility and manufacturing and logistics processes through to smart homes and agricultural applications.

To further develop our IoT technology portfolio, moreover, we pooled our expertise at the start of 2020 and set up the Bosch.IO GmbH subsidiary. This subsidiary helps our divisions develop and implement IoT solutions, is responsible for the IoT Suite and use of the Bosch hybrid cloud, and sells its own solutions to external customers in selected areas. The company is the successor to our Bosch Software Innovations GmbH subsidiary, whose achievements included developing the IoT Suite and the Deepfield Connect sensor system as well as connected agriculture software solutions based on it. As early as 2018, we created the position of chief digital officer. This board of management member is responsible for IoT issues, group IT, and – as chief technology officer – for coordinating technology, manufacturing, and development as well as research and advance engineering in the Bosch Group. Together with the persons responsible for digital issues in the operating units, the chief digital officer coordinates IoT activities across the group. Company-wide policies have been drawn up for this purpose.

Expanding expertise in artificial intelligence

We are aiming to carve out a leading position in the field of artificial intelligence (AI), by using AI both in our products themselves and in their development and manufacture. We want to create an AI that is safe, robust, and explainable. As a foundation for this, we have adopted our own Bosch code of ethics for AI. We are steadily expanding our Bosch Center for Artificial Intelligence as the group's center of competence for AI. It already has seven locations across the world – in Germany, the U.S., China, India, and Israel. Since 2019, our AI-related activities have also included the Robert Bosch Center for Data Science and Artificial Intelligence in the Indian city of Chennai, the second in the country following Bengaluru. Our AI experts are working on projects connected with mobility, manufacturing, smart homes, and agriculture. In addition, we will be investing in the construction of a new AI campus in the German university city of Tübingen, which will provide a space for the creative exchange of ideas between Bosch's AI experts, external startups, and public research institutions. This will also give a boost to the Cyber Valley initiative, which was launched in 2016 with Bosch as a founding member. This joint research venture brings together partners from industry, academia, and politics to drive forward AI research in the Baden-Württemberg region.

Mobility Solutions

Of the changes currently affecting Bosch, the most profound ones are those impacting the Mobility Solutions business sector. The automotive industry is going through a fundamental upheaval. Although this presents Bosch with major opportunities in the medium and long term, it also poses significant challenges and burdens that go beyond the fall in global automotive production since 2018. Climate action targets, changes in user preferences, and new technological opportunities will lead to a fundamental shift in mobility. As one of the leading innovators, we want to play a major role in shaping this move to alternative forms of mobility and drive forward change in the automotive industry. Our vision is to make the mobility of the future sustainable, safe, and exciting.

In strategic terms, the business sector is focusing on its role as a supplier of automotive components and subsystems as well as on the mobility lifecycle business involving operators of vehicle fleets and mobility platforms. This business involves additional products and services for fleet operators, such as regular data acquisition, over-the-air software updates, and smart battery-charging systems. Having decided to focus our mobility lifecycle business on B2B activities, we have resolved to discontinue our e-scooter sharing and ride-hailing operations.

We want to generate further growth for Mobility Solutions in its existing activities, as well as expand the Bosch portfolio. Making significant upfront investments in promising areas while also implementing the necessary adjustments to changing markets poses significant challenges and requires dedicated effort. On the one hand, we want to position Bosch as a leading provider of important services of the future such as electromobility, automated driving, electronics, and B2B services for connected mobility, and drive forward the expansion of units such as eBike Systems, Two-Wheeler and Powersports, and Commercial Vehicles and Off-Road. On the other hand, we need to focus rigorously on cost structures that will be competitive over the long term. Boosting the business sector's profitability once again is essential in order to exploit its long-term opportunities for growth in promising areas.

Major changes in powertrain technology

The changes underway in the field of powertrain technology are particularly profound. We are adopting a technology-neutral approach and are offering our customers a wide range of products and services. The combustion engine still has significant market potential. We expect that, in 2030, it will feature in at least two out of every three newly registered passenger cars and light commercial vehicles across the globe – many of them hybrids. This is why we are continuing to work on optimizing the combustion engine. In diesel passenger cars, we have made major technical progress in tackling NOx emissions by adding a second inlet point for the additive AdBlue. This modified system has now gone into production. Moreover, modifications to engines and a new generation of particulate filters are significantly reducing untreated particulate emissions from gasoline engines. Greater use of renewable synthetic fuels could open up additional potential for the combustion engine. Such fuels could reduce CO_2 emissions from existing vehicles as well, as they can be mixed with conventional fuel. We also supply components for vehicles powered by natural gas and ethanol.

Major potential for growth in electromobility

We want to play a leading role in electromobility. We already have a very broad portfolio in this area – both in terms of components and systems, which range from 48-volt mild hybridization to fully electric drives, and segment-wise, from e-bikes to commercial vehicles. In powertrains, our extensive product portfolio includes e-axles and their core components – electric motors and inverters – as well as power electronics, chargers, and energy storage systems (48-volt batteries).

New partnerships are also playing a role here. In the battery cell segment, we agreed a long-term strategic partnership for 48-volt batteries with Contemporary Amperex Technology Co. Limited, based in Ningde, China, in 2019. The 48-volt battery is part of our range of 48-volt systems alongside other system components such as DC converters and electric motors. These systems facilitate entry-level hybridization for all vehicle classes, supplementing the combustion engine with an electric motor that reduces its energy consumption and CO_2 emissions. Kinetic energy is stored during the braking process and released when the vehicle accelerates. We have also developed a "rolling chassis" in partnership with the chassis and automotive technology company Benteler Automobiltechnik GmbH, based in Paderborn, Germany. This comprises a pre-integrated chassis featuring axles, electrical powertrain, brakes, steering, and thermal management system. In the future, it will also feature automated driving functions.

We want our newly developed silicon carbide microchips to bring about a technological leap in electromobility. Silicon carbide semiconductors are opening up new possibilities in terms of switching speed, heat loss, and sizing, thus helping to extend the range of electric vehicles. Alternatively, batteries can be made smaller, and thus less expensive. They also improve the effectiveness and power density of our e-axle, a system component in electric vehicles. The latest generation of silicon carbide semiconductor chips is being manufactured at our plant in Reutlingen, Germany. In addition, we are setting up a modern semiconductor production line in Dresden for 300-millimeter wafers. In 2019, we also premiered specially developed microchips that increase safety in electric vehicles. In the event of an accident, they help ensure that the car's high-voltage battery is automatically disconnected, and that power in the vehicle is shut off as quickly as possible. We also want to extend the service life of electric vehicles with new cloud-based services that aid vehicle battery management. Software functions continuously analyze battery status and support measures to combat cell aging. These cloud services can thus be harnessed to optimize the recharging process and send tips right to a car driver's in-vehicle display, telling them how best to drive to preserve their battery life.

In the fuel-cell segment, we will be starting large-scale production of components and systems. The core component is the "stack," where hydrogen is converted into electrical energy. We have partnered with the fuel-cell stack manufacturer PowerCell Sweden AB, based in Gothenburg, Sweden, to develop stacks. Under the partnership agreement, both partners will work jointly to make the polymer-electrolyte membrane (PEM) fuel-cell stack ready for production. Bosch will then mass-produce the stack under license for global automotive applications. The stack expands Bosch's range of fuel-cell components, which includes its air compressor fitted with power electronics and its control unit equipped with sensors. Staying in the fuel-cell segment, we have developed a 240 kW fuel-cell powertrain for the prototype of the Nikola Two electric heavy-duty truck, in partnership with the U.S. startup Nikola Motor, based in Phoenix, Arizona. This prototype was unveiled in 2019. Bosch is contributing other components and systems too, such as the vehicle control unit, the electrically assisted Servotwin® steering system, and the dual-motor e-axle.

Automated driving: a major area with a promising future
The growing trend toward driver assistance and automated systems is showing no signs of stopping. We want to position Bosch as a leading provider of automated driving solutions and are already generating substantial growth from increasing vehicle automation. Level 1 and 2 driver assistance systems are the basis of this, and we are systematically improving these systems.

We are currently working on "Highway Assist – hands-free" systems. These are highway assist systems that allow drivers to take their hands off the wheel during partially automated driving. While not yet approved for use in Europe, these systems can be used in the United States and China. Together with our partner Daimler AG, we have also been granted the world's first official approval to operate a level 4 system (driverless driving within a defined geographical area) in the parking garage of the Mercedes-Benz Museum in Stuttgart. A smartphone app based on smart infrastructure makes this automated valet parking service possible. Bosch sensors in the parking garage monitor the driving aisle and its surrounding area and provide the information needed to guide the vehicle. The technology in the car converts the commands from the infrastructure into driving maneuvers.

We have also launched a pilot project for an app-based ride-sharing service involving automated vehicles in the Silicon Valley city of San José – again with our partner Daimler AG. The trial is intended to provide insights about a driving system for automated driving and about the integration of such vehicles into mobility systems. To allow increasingly automated vehicles to sense their surroundings, we use various sensor techniques such as ultrasound, radar, and video technology. A new generation of our radar sensors is even better at capturing the vehicle's surroundings, even in bad weather and poor light conditions. The basis of their improved performance is greater detection range, wide aperture, and high angular resolution. This means that systems such as automatic emergency braking can react more reliably. We are also adding a long-range LiDAR sensor to our sensor portfolio. This laser-based distance meter is required for driving functions at automation levels 3 to 5. Because it is designed to cover both long and short ranges, it is suitable for both freeway and city driving. Moreover, a new camera technology we launched in 2019 relies on a new multi-path strategy that uses AI to detect objects. The innovative MPC3 video camera significantly improves the vehicle's perception of its surroundings.

In addition, a new interior monitoring system featuring cameras and AI is designed to make driving safer and more convenient by detecting when the driver is distracted or fatigued, and giving them support. This support is crucial starting at automation levels 2 and 3, where the driver has to be able to take back control of the steering wheel safely at any time. At level 2, features such as the traffic jam assist or highway assist – which are already permitted in some markets – allow drivers to take their hands off the wheel temporarily. However, they still have to concentrate fully on the road, because they are responsible for monitoring the driving task. Level 3 functions such as the traffic jam pilot and highway pilot allow drivers to engage in permitted secondary activities during the automated journey. The new system's camera uses AI to interpret how ready the driver is to step in. It also recognizes who is in the driver's seat, thus enabling additional convenience functions such as applying personalized settings or enabling them to control infotainment services using gestures and eye movements.

The 3D display is a further innovation: the 3D effect and the impression of depth provided by the display enables the driver to register information such as warnings more quickly. In the future, these display and operating systems will be supported by an integrated central cockpit computer. In addition, over-the-air updates ensure that the infotainment is always kept up to date, just like a smartphone. A further innovation – the "Perfectly keyless" keyless vehicle access system – helps make life more convenient for the driver. It works using a virtual key stored on a smartphone. The system enables drivers to use their smartphone to automatically unlock their vehicle, start the engine, and lock the car again. Sensors installed in the car detect the presence of the smartphone and only open the vehicle for the person with the right authorization.

We are also feeding our mobility expertise into other areas in which we do business. This includes Bosch Sensortec's Light Drive System for smartglasses: a compact, lightweight, sensor-based solution that is also compatible with standard

glasses. It uses a MEMS-based laser scanner and a holographic element in the lens of the glasses to project an image directly onto the wearer's retina. This image can contain any kind of text notification such as navigation information or even operating instructions.

Expanding other areas of business

We also want to achieve further growth in the Two-Wheeler and Powersports unit. In this context, safety is especially important, with smart, connected on-board systems set to play an increasingly important role in the future. We are steadily expanding our assistance systems for motorcycles, such as ABS and motorcycle stability control. These systems also include sensor-based rider assistance systems: adaptive distance and cruise control, a collision warning system, and blind spot detection. The advanced rider assistance systems package of solutions that act as a protective shield for motorcyclists is set to go into production in 2020. This world first will also be enhanced by the connected solution HelpConnect in the future. With an integrated information and communication system, we are also combining several traditional instruments and numerous infotainment functions

in a single device. In addition, we are working on electromobility solutions for two- and three-wheelers, as well as for powersports vehicles.

In the Bosch eBike Systems division, which was established at the start of 2020, we are continuously expanding our range of drives, batteries, and control units with connectivity functions and digital solutions for e-cyclists, as well as services for specialist bike dealers. Bosch eBike Systems was previously part of the Automotive Electronics division. It is being made an organizational unit in its own right in order to bolster its further growth. Its range now includes electric drives for sporty mountain bikes and cargo bikes as well as batteries with increased capacity and range that can be integrated into the bike frame. We are also continuously enhancing our products by adding new features and updates. For instance, the Kiox on-board computer is being given additional connectivity features, while the Nyon and SmartphoneHub infotainment systems can be connected up to other service providers. In addition, we want to move into two important strategic areas: safety, with e-bike ABS and an e-call function, and connected bicycling, with the One Bike Cloud for future IoT solutions. We are also strengthening our dealer service in Europe with the newly established joint venture Magura-Bosch Parts & Services GmbH & Co. KG, based in Bad Urach, Germany, in which we have taken a 50 percent stake.

In the Commercial Vehicles and Off-Road unit, we are working on innovations for trucks and digitalized agriculture. We are also continuing to adapt technologies from passenger cars for this purpose. For instance, the unit now also offers the multi-camera system for off-highway vehicles such as forklifts. The system shows drivers a realistic representation of their vehicle as an accurate 3D model on their display. This helps the forklift maneuver with precision and makes it possible to estimate distances more accurately while on the move. We have also launched a comprehensive digitalization strategy for agriculture in cooperation with various partners. NEVONEX is designed as a non-proprietary open platform, on which providers of agricultural technology, equipment, and services can advertise their products.

Adjustments and greater profitability
A major strategic focus for the next few years will be adapting the structures in the Mobility Solutions business sector in line with future market requirements. Extensive measures are required in light of the significant decline in global automotive production from its peak in 2017 and, in particular, the upheaval in powertrain technology. For instance, a much smaller proportion of passenger cars in the major core markets of Europe and India are now diesel vehicles. Among passenger cars, there is a growing trend toward gasoline powertrains as well as hybrid and electric vehicles. Emissions legislation in key markets is also shortening the time gap between new generations of gasoline direct injection systems. What is more, value creation is much lower in the production of components and systems for gasoline engines and in electromobility than it is in diesel technology.

We therefore need to adjust our structures, particularly in the Powertrain Solutions division. In 2019, we instigated a range of restructuring measures and announced several more. The related personnel adjustment measures affect not only German and European locations but also those in Asia and the Americas – in manufacturing, but also in administration, sales, and development. We have also made changes in the Automotive Aftermarket division, where we are discontinuing production of starter motors and generators at our subsidiary Unipoint Electric Mfg Corp. Ltd, based in Taipei, Taiwan. Our spark plug manufacturing operations in China are being aligned with the slowing market. We also announced additional personnel adjustment measures in the Automotive Steering division, which is feeling the effects of the tougher market situation very keenly. In addition, the division is planning to refocus its steering pump business for passenger cars and commercial vehicles, as the trend is moving away from hydraulic and toward electric pumps. Furthermore, we want to refocus our steering column business in Europe and consolidate manufacturing activities. Adjustments are also required in the Automotive Electronics division to stay competitive. We are aiming for adjustment measures that are tailored to each individual location and specific situation. The personnel adjustment measures will also be implemented in as socially responsible a manner as possible, including early retirement arrangements, voluntary redundancy, and reductions in working hours.

We are also running a cross-divisional performance program across the entire Mobility Solutions business sector, with the aim of creating structures that will be competitive in the long term. This is designed to bring lasting improvements to our cost base in administration, sales, and research and development. Rigorous improvements in current assets and costs of materials are another component. These will be complemented by specific programs in the individual divisions to strengthen long-term competitiveness and cut complexity, which could also include a further streamlining of the product portfolio.

Industrial Technology

In the Industrial Technology business sector, we are focusing on expanding activities in the Drive and Control Technology division (Bosch Rexroth AG) in its capacity as provider of mobile and industrial hydraulics and factory automation. In this segment, Bosch Rexroth is establishing itself increasingly as a provider of Industry 4.0 solutions for the factory of the future, with solutions based on software, automation, and connectivity. Our Bosch Connected Industry business unit also operates in this field. Up until now, the Robert Bosch Manufacturing Solutions unit has mainly worked on assembly system solutions and innovative production processes within the Bosch Group, offering an extensive range of services. However, we intend to make increasing use of its expertise externally too. We sold our subsidiary Robert Bosch Packaging Technology GmbH, based in Waiblingen, Germany, to CVC Capital Partners, based in Luxembourg. The company, which is now known as Syntegon Technology GmbH, Waiblingen, was transferred in its entirety, with its Pharma and Food units, to the purchaser at the end of 2019, once approval from the antitrust authorities and other authorizations had been granted. We had signed the relevant contracts in mid-2019. We are also focusing strategically on making the Drive and Control Technology division more robust in the face of major cyclical market fluctuations. This will be aided by the streamlining of global structures in administration, sales, and research and development that was announced during 2019. Refocusing the sales structure is also intended to take account of the changing requirements of customers and the market.

Innovations – a very important factor
Technologically, the Drive and Control Technology division is focusing on the market requirements of the future in its two main areas of business, hydraulics and factory automation. In hydraulics, these trends primarily encompass digitalization in machinery development, the modularization of the product portfolio, electrification, system integration, greater systematic data analysis as part of new business models, and the growing importance of user-experience considerations. The major trends in factory automation that Bosch Rexroth is addressing include autonomous logistics systems, collaborative robotics systems, inline inspection systems, data analysis, the use of user-friendly control and monitoring systems, and opening up growth areas, such as in battery production.

Following the "hidden hydraulics" approach, hydraulic systems such as servo-hydraulic axles (CytroForce) will, in the future, combine all the necessary components such as cylinders, valves, storage units, pumps, electric drives, and sensor systems in a single, electric plug-and-play unit that will be sold complete with the software required for the desired features. Putting such axles into operation is thus made much easier – very much along the lines of an electric axle – and does not require any in-depth knowledge of hydraulics. The first products will be premiered this year. In effect, this continues the approach adopted by the compact and efficient CytroBox hydraulic power unit. In 2019, Bosch Rexroth unveiled the first components from its future electrification range at bauma, the industry trade fair for construction machinery. Its range of construction machinery takes account of stricter standards for emissions and efficiency, and reaches from new 700-volt electric motors, inverters, and transmissions to modular software and compatible hydraulic pumps. All these products are enhanced by Bosch's many years of electromobility expertise.

Another strategic priority in the area of factory automation is Industry 4.0 and the Bosch Rexroth vision of the fully connected factory of the future. Here, the division intends to take a leading position and be a driver of innovation. Faster product changeovers and the customized manufacture of products – right down to a batch size of one – call for flexible automation solutions that can be exchanged quickly. In its linear motion technology activities, therefore, Bosch Rexroth has come up with new mechatronic solutions that combine mechanics with electrics, software, and sensor systems. Thanks to pre-installed software with automated parameterization and initialization for the entire system, systems can be taken into operation in no time at all and without any prior programming knowledge. The first of this series of solutions is the Rexroth Smart Function Kit, a modular kit for pressing and joining applications. The integrated sensors, which are analyzed using algorithms, also reduce the risk of machine downtime and the amount of maintenance work.

With its new automation platform ctrlX AUTOMATION, Bosch Rexroth is giving machinery manufacturers a new level of freedom. Ready-made, customized, and customizable apps allow software functions to be combined in virtually any number of ways and created in a wide range of programming languages. Bosch Connected Industry's Nexeed software can also be linked to ctrlX AUTOMATION. Nexeed is already compatible with the 5G standard. The Nexeed Industrial Application System significantly improves the overall equipment effectiveness of machinery. The software allows information relevant to the manufacturing process to be accessed in real time. Users also benefit from the experience gained in Bosch plants and warehouses, where all Nexeed solutions are trialed and evaluated.

The concept of “intralogistics” – autonomous transport systems designed to increase flexibility and transparency – is becoming increasingly important in the automated factory. The ActiveShuttle, which was premiered at Hannover Messe in 2019, transports loads weighing up to 260 kilograms, and is loaded and unloaded in a fully automated process using an integrated lifting platform. It emerged from a partnership with grow, Bosch’s own startup platform. Bosch Rexroth is also expanding in new growth markets for factory automation, such as battery production. This is not just a case of supporting suppliers, but also of initial projects for complete battery manufacturing operations. This work is being done in close cooperation with our internal mechanical engineering and assembly specialist Robert Bosch Manufacturing Solutions, Bosch Connected Industry, and other Bosch units that also contribute extensive Bosch battery expertise. Bosch Industry Consulting, part of Bosch Connected Industry, also offers industry advisory services focused on carbon neutrality.

Consumer Goods

Additional market growth creates opportunities
An important part of our strategy lies in further developing the Consumer Goods business sector, where our focus is on strong international and regional brands. We are anticipating long-term growth in the global markets for both power tools and household appliances, driven not least by increasing demand from emerging markets.

Power Tools launching major innovations
In the power tools segment, there is a growing trend toward cordless tools and digitalization, mainly in the advanced economies but also, increasingly, in the emerging markets as well. We thus want to increase the percentage of cordless tools in both the professional and DIY user segments, expand our digital services business, harness digitalization for more direct customer contact, focus even more closely on user-centricity, and carve out a leading position in the emerging markets.

User-centered innovations are playing a major role. In the professional segment, we are increasingly focusing on cordless tools that give their users extra flexibility. By making them much more powerful, we are increasingly making it possible for them to replace corded tools. The Biturbo range is opening up a whole new dimension in performance in this area: Angle grinders, saws, and hammer drills have been optimized for maximum performance with ProCore 18-volt rechargeable batteries, which boast state-of-the-art, enhanced-capacity cell technology and a battery design with improved cooling. This combination results in an extremely compact design, yet also in increased power output. The tools offer professional users the power of a 1,000 to 1,800-watt corded tool. With just one battery, therefore, they are just as powerful as the two-battery models that have been standard on the market up until now. Compatibility with conventional lithium-ion batteries is also guaranteed. Another user-oriented product innovation is the X-LOCK system for angle grinders, which makes changing accessories easier, as well as five times faster. The aim is to work together with partners to set a new standard that makes work easier for professionals and increases productivity.

Power-tool design also plays a significant role for DIY users. The foundations were laid by the handy Ixo cordless screwdriver, which was launched some years ago. Bosch is reinventing the Ixo – now in its sixth generation – with technical improvements and an enhanced design. The product portfolio of high-performance 18-volt tools for DIY users is also being expanded. We are also keen to ensure that our rechargeable lithium-ion batteries will be compatible with current and future power tools, enabling users to use existing batteries and chargers.

One way we have enhanced our range of services is with the addition of a user-friendly measuring app that helps both professionals and DIY users to record, document, and process measurements even more easily. Another new app – for DIYers and gardeners – provides additional information when buying power tools and inspiration for how to use them. In addition, establishing and further improving digital business models within the division's individual areas of business will underpin new products and services. Another area of focus in 2020 will be various projects relating to the "smart construction site" theme, which are being supported in partnership with grow, the Bosch startup platform.

The Power Tools division has also further expanded its product portfolio of tools designed specifically to meet the needs of users in emerging markets such as Africa. These users expect their equipment to be low-cost and robust. Business responsibility for this country group, including product development, lies in China. The division is also accelerating the expansion of its online store alongside other go-to-market strategies. Power Tools is facing tougher competition from newly emerging competitors, growing pressure from a consolidating market, and the growth of e-commerce.

BSH Hausgeräte: focus on users and connectivity

Our subsidiary BSH Hausgeräte is addressing three major trends in its markets: the onward march of digitalization, changes to market channels, and increasing competition. Strengthening long-term potential for sales volumes and earnings is an important objective. This will include adopting a narrower focus on reducing complexity in organizational structure and project portfolio, increasing plant capacity utilization, shortening the development process, and improving the cost situation. As well as strengthening its market position in China, its strategy will concentrate on cementing user-centricity in its product innovations, creating relevant IoT ecosystems, developing new forms of market and customer access based on increasing digitalization, and expanding its market position in the emerging markets, also by means of products customized for these markets.

In terms of its products, BSH Hausgeräte is pursuing a consumer-focused "Hardware+" strategy. For this reason, our subsidiary is also increasingly offering digital and personalized services in addition to innovative household appliances. Its SystemMaster is a digital control unit that enables connectivity for all household appliances. In the future, its new microprocessor and standardized software architecture will allow consumers to use digital services, download programs, and update software on their connected household appliances. For instance, they will be able to follow step-by-step recipe videos, reorder dishwasher tablets, and make use of customer support services such as a reminder to extend a warranty. The users of the future will thus be able to enjoy new service innovations from BSH Hausgeräte even after they have purchased their household appliance. The first appliances equipped with this new platform will go on sale in 2020.

One of BSH Hausgeräte's main areas of focus is the connected kitchen. The household appliance manufacturer expanded its Home Connect digital ecosystem in 2019, attracting many new partners across the world. These include the U.S. company Fitbit, Inc., based in San Francisco, which sells fitness trackers.

For the first time, Home Connect users can now access Home Connect appliances through their smartwatch as well as their smartphone or smart speaker – in order to start their coffee machine or preheat their oven, for example. Home Connect is also using its partnership with Google Assistant to enhance its voice integration function. These partner services ensure that the digital features of appliances connected with Home Connect are updated continuously throughout their life cycle. The range of services available on the Home Connect app was also significantly expanded in 2019. The focus is on the day-to-day benefit it brings to consumers, such as time savings and personalized convenience, thanks to features such as even more intuitive and user-friendly navigation. Home Connect is also extending its range to cover the entire home: the open platform allows all connected devices and services in the consumer's house or apartment to be integrated.

BSH Hausgeräte showcased the new Cookit under the Bosch brand name at the industry trade fair IFA 2019. This connected kitchen appliance with a cooking function offers consumers straightforward, time-saving solutions for cooking fresh meals every day. Users can choose from a selection of step-by-step recipes or leave the cooking to automatic programs. BSH Hausgeräte launched a new product in India in 2019 that also bears the Bosch name. The Bosch Modern Chulha was developed specifically to meet the requirements of many consumers in the country. It is a wood stove designed to make cooking easier for all those people without access to gas or electricity. The product provides an alternative to the fire pits that can be found inside many Indian homes. The Bosch Modern Chulha emits less smoke than these traditional pits, needs less wood, and speeds up the cooking process. This is because the stove's geometry ensures sufficient space for the wood to burn more efficiently, provided the air supply is right.

BSH Hausgeräte is also working with a U.S. partner to support startups in the connected home field. Up to ten external startups in the early stages of their development can take part in the BSH Future Home Accelerator program. Its aim is to quickly identify digital business models with potential for success, to promote their further development, and to offer mutual inspiration for the design of connected kitchens. The BSH Startup Kitchen, a further model for cooperation with innovative fledgling companies, is also now up and running. Here, BSH Hausgeräte acts as a "venture client," meaning that it offers startups with innovative solutions for BSH products and BSH processes sales-based cooperation without any risk capital or equity partnership. The partners' products or services are tested out before they are market-ready, and the partnership is put through its paces in pilot projects geared toward establishing a long-term business relationship.

Energy and Building Technology

Growing electrification in thermotechnology
Tougher requirements for reducing CO_2 emissions are increasing the importance of electrification in heating and air-conditioning technology, as well as for hot-water generation. The trend toward digitalization and decentralization is also playing a role. The Thermotechnology division uses a modular system concept to offer energy-efficient heating and hot water solutions as well as IoT applications and hybrid solutions, such as gas-fired boilers combined with heat pumps. The division is also bolstering its electric heat-pump growth segment, adopting a broad-based technology strategy that covers air-to-water, brine-to-water, and air-to-air heat pumps. As well as being used in new builds, heat pumps are thus set to play a fundamental role in modernizing existing building stock as well. The division is currently working on a new generation of much quieter heat pumps and is broadening its sales base in this area, focusing on digitally assisted systems solutions that are easy to install. The hot-water boiler business will also see a move toward solutions based on electricity and renewables. In this segment in particular, the division is working to reposition itself and thus become more competitive. In 2019, one important step for the Thermotechnology division was the switch from the Junkers brand to the Bosch brand in Germany. Bosch is one of the division's two main brands, the other being Buderus.

Thermotechnology is also opening up new market segments and digital solutions such as energy management. The software behind its newly developed energy manager ensures that energy consumption, power generation, and energy storage are coordinated efficiently among different components such as heat pumps, photovoltaic arrays, power storage units, and, in the future, electric vehicles. The energy manager thus also allows locally generated electricity to be used and heat to be produced efficiently. It is integrated into the Bosch Smart Home system. An app gives users an overview of all the relevant data and lets them connect up additional household appliances. In addition, we are increasingly supporting engineers with digital service tools. New to the range is the Logasoft YourBusiness cloud software from Buderus, which helps engineers run their business. It also offers an inquiry configurator for digital customer acquisition – in other words, a platform that heating companies can integrate into their website and use to prepare individual quotations for their customers quickly in just a few clicks. Bosch Industriekessel GmbH, based in Gunzenhausen, Germany, which provides thermotechnology solutions for commercial and industrial customers, showcased smart control technology and a digital energy efficiency assistant at the industry trade fair ISH Energy in 2019. As well as enabling operating data to be monitored and made available, it also employs algorithms to inform users in advance about potential breakdowns. In addition, the system helps improve the availability of equipment and reduce energy costs.

However, sector coupling is also gaining in importance in entire city districts, not just in individual buildings. It will be a key to meeting the future energy-supply requirements of residential areas. To achieve it, components such as electrical storage units, charge spots, fuel cells, and complementary energy management software have to be combined into an overall system. We at Bosch are driving forward the development of solid-oxide fuel cells (SOFC) for new energy systems and are partnering with a specialist in the technology, Ceres Power Holdings plc, based in Horsham, United Kingdom. The partnership includes taking a stake in Ceres Power, which we increased to roughly 18 percent in early 2020. SOFC systems are intended for use in cities, factories, and data centers, and are designed to support connected, distributed power generation. Because these standardized systems are highly flexible, they are able to cover peak demand better. The aim is for one SOFC module to generate 10 kilowatts of electrical power. If more energy is required, any number of modules with the same output can easily be combined.

Building Technologies offering cross-domain solutions

The Building Technologies division offers systems, solutions, and services that ensure the safety of people, buildings, and other material assets, as well as increasing convenience and energy efficiency. Our aims in this division are to further strengthen our global product business and to continue the expansion of our regional system integration business. In the product business, we are concentrating in particular on making our video business portfolio more competitive. Increasing the division's profitability is a further strategic focus.

Digitalization is also giving rise to an increasing number of integrated solutions in the buildings segment, generating demand for cross-domain solutions and connected systems. A current example is one of Europe's largest architectural projects, Port Praski in the Polish city of Warsaw. The division is supplying an integrated security solution for this combined residential and office district, comprising fire alarm systems, video security systems, and building management software. We believe that exploiting the potential of the IoT and artificial intelligence methods offers attractive growth opportunities. This also includes data-based service business, data analysis, and new business models.

In the video system segment, a new generation of Flexidome IP cameras was debuted. These feature an innovative concept that makes it much easier for customers to preconfigure, install, and start using their cameras, thanks not least to remote wireless startup and a companion app. The new generation also comes with machine learning in the form of a "Camera Trainer," which enables video analysis tailored to the customer's specific needs. The Flexidome IP cameras provide exceptional detail even in low-light situations. The range of possible uses for the video-based fire alarm system Aviotec has also been extended, now ensuring reliable fire detection even in very poor light. It also now comes equipped with algorithms developed specifically for the detection of smoke and flames in tunnels as well as with new lenses that significantly extend its detection range. This enables it to be used for video surveillance as well as fire detection, saving on investment and operating costs. Aviotec is already being used at the premises of a major German printing specialist, for example, where it ensures improved fire protection in the customer's waste paper centers.

In 2019, Building Technologies acquired the building automation specialist GFR-Gesellschaft für Regelungstechnik und Energieeinsparung mbH, based in Verl, Germany, as part of its system integration business. GFR provides complete building automation solutions and associated services with a comprehensive portfolio of hardware and software products. The division wants this acquisition to inject even more momentum into its digital solutions and services for commercial buildings and allow it to offer customers cross-domain solutions. This business model is already proving successful for activities in North America, where the U.S. subsidiary Climatec LLC, based in Phoenix, Arizona, provides building automation, energy efficiency, and security solutions.

The Building Technologies division also joined forces with Hanwha Techwin, Milestone Systems, and Vivotek Inc. to establish the industry consortium Open Security & Safety Alliance, Inc. The consortium is an unlisted non-profit organization, and has set itself the aim of creating a common standardized platform for security solutions. Our subsidiary Security and Safety Things GmbH, based in Munich, Germany, works closely with Open Security & Safety Alliance to provide its members with an open, standardized IoT platform for security camera apps. Initial prototypes of these cameras and apps were premiered at various trade fairs in 2019. Pilot projects involving customers are also underway.

Expanding Bosch Global Service Solutions

The Bosch Global Service Solutions division focuses on mobility, IoT, and monitoring services for customers, as well as customer experience. It concentrates specifically on service design, which includes both optimum design and advising customers on setting up service processes. For this purpose, the division is further expanding its core competencies. These include integrated end-to-end platforms, i.e. platforms for complete solutions, as well as service and process automation using technologies such as robotic process automation (RPA). The division also gained strength in 2019 with the acquisition of the startup LAWA Solutions GmbH, based in Gießen, Germany, which specializes in highly scalable cloud-based software products in the automotive and logistics industries. The company has been transferred to the new "Center of Competence for Digital Business Innovation," which is to be significantly expanded and will provide a basis for connected mobility innovations in the future.

Further development of smart-home solutions

The Bosch Smart Home unit aims to provide users with a sense of well-being and security in their homes by making its smart-home solutions easy to use as part of their daily routine. To do this, we are opening up our system: from mid-2020, following the integration of the Amazon Alexa and Google Assistant voice services, it will be possible to use the Apple HomeKit – and thus also its app and voice assistant – to control the Bosch Smart Home system. In addition, Bosch Smart Home will offer an open interface for selected partners, who will be able to integrate Bosch Smart Home devices into their own solutions via a cloud API (application programming interface). It will also be possible to control some elements of the devices using the partners' own apps. Furthermore, the unit is continuing to develop its products with every new software release. The lighting and shutter controls in the alarm system quickly clear escape routes in the event of a fire. Another innovation is a room thermostat that can be positioned flexibly thanks to its cordless power supply and wireless connection. As well as radiator thermostats and underfloor heating, the room thermostat can also control electric heaters connected using an adapter.

Opening up new areas of business

Our subsidiary company Bosch Healthcare Solutions GmbH, based in Waiblingen, Germany, offers connected products and services in the new business field of healthcare and medical technology. These include diagnostic solutions such as Vivatmo, a system for closely monitoring the progression of allergic asthma in patients suffering from the disease. Bosch Healthcare Solutions is also launching Vivalytic, a fully automated platform for molecular diagnostics. Another diagnostic innovation is the Vivascope system, developed at Robert Bosch Engineering and

Business Solutions in India. This system is able to magnify cells in samples of blood and other bodily fluids using a microscope, display them digitally, and analyze them using artificial intelligence. Machine learning is used to train the device with images of and data on cells so that it can quickly and precisely identify any irregularities in them and help physicians with their analyses and diagnoses. This is particularly beneficial in regions and facilities that lack the relevant laboratory infrastructure, as the data sent to the cloud can be shared electronically with other laboratories and physicians. The Vivascope system is initially to be sold in emerging markets.

Since 2013, grow platform GmbH has provided a platform within Bosch for developing and implementing new business models and has helped cultivate new business and strengthen startup culture in the group. In 2019, grow was merged with international growth projects in South Africa, India, China, Japan, Brazil, and the U.S. to form a global innovation network for evaluating new business models and pursuing them in start-up teams. A series of startups supported by grow are already being developed further in the divisions. Another element of its business model consists in finding additional development opportunities for the startups, such as by involving external investors or operating them as a new, self-contained unit if they are not considered enough of a strategic fit.

Through Robert Bosch Venture Capital GmbH, we invest in external technology startups around the world. This gives us early access to innovative technologies, including potentially disruptive ones. The company's investments focus on projects involving highly automated driving, AI, the IoT, mobility solutions, and computer architectures of the future. Its investments in 2019 included the Chinese company Trunk, which develops new technologies for self-driving trucks in China, the Israeli company Versatile Natures, which focuses on machine-learning and AI methods for maximizing efficiency in the construction industry, and the U.S. AI-based marketplace Xometry, a specialist in the on-demand manufacture of customized parts and small batches. Our venture capital company also invested in Zapata, a U.S. company that develops high-performance, hardware-independent solutions for cutting-edge quantum hardware.

Working in the Bosch Group

In view of the many different challenges we face, leadership, cooperation, and training are key to taking the company forward. We strongly believe that cooperative leadership, networking among associates, and an approach to feedback based on openness and mutual respect boost motivation, promote innovation, and are essential to our future success. Times of change in particular require a great deal of transparency and communication. We want to foster a leadership culture based on values. Our “We LEAD Bosch” principles for leadership are intended for associates just as much as executives, and are designed to provide both guidance and stimuli for leadership behavior and teamwork. This is especially relevant when working in agile teams and units, whose defining features include flat hierarchies. At the same time, process standardization is becoming increasingly important. With this in mind, we set up a corporate service unit, Global Business Services, at the start of 2019. It brings the most important services in the areas of accounting, HR, logistics, and purchasing together under one roof. The aim is to offer the operating units efficient, integrated processes, thereby harnessing the benefits of continued digitalization.

Alongside our extensive training activities, we also place particular importance on continuing education. The rapid development of new digital technologies and business models, coupled with evolving working processes and methods, is making lifelong learning even more crucial for all executives and associates. We want to make Bosch a learning organization. We are focusing on learning programs that pave the way to acquiring new skills in areas such as electromobility, software development, and AI. Digital topics are thus making up more and more of the content of our training courses. On the occupational training front, we are promoting digital learning in numerous projects and adding new channels for IT training such as supplementary distance-learning courses. Providing our associates with a modern learning infrastructure with digital learning content is also important, as it allows learning to be integrated into their daily routine. This also includes access to e-universities, Bosch's own video platform, and mobile learning options for smartphones.

At the same time, we want to acquire talent in predefined areas, particularly in software and data analysis. We are also developing our remuneration strategies and creating working and employment conditions that are fit for the future. Wherever it is compatible with local industrial relations and culture, we offer our associates around the world the freedom of flexible working hours and a range of flexible work schedules. We want to foster a staff development culture that encourages associates to shape their individual careers in line with their abilities and interests. As employers, we are also concerned to do more to improve our associates' personal mobility. One of the things we are supporting is an initiative for multimodal company mobility management for the Stuttgart pilot region. This includes shuttle buses for the daily commute, similar to those already in use at Bosch in India, China, and Turkey. Co-working spaces at Bosch sites also allow staff to work at whichever location is closest to them. In addition, we are supporting improvements to public transport links and offering incentives to switch to alternative modes of transport in the form of leasing deals for e-bikes.

Sustainability

Environmental protection, conservation of resources, and occupational health and safety have always been priorities for Bosch. Robert Bosch GmbH has been a member of the United Nations Global Compact since 2004, and is committed to its ten worldwide principles for responsible corporate governance. For us, "Invented for life" is also about reducing the environmental impact of our products and manufacturing processes. Comprehensive information is provided in our sustainability report, which was significantly expanded for the 2018 business year. Among other things, it contains detailed information on trends in our CO_2 emissions indicators and accident rates, as well as on other environmental factors and aspects of sustainability.

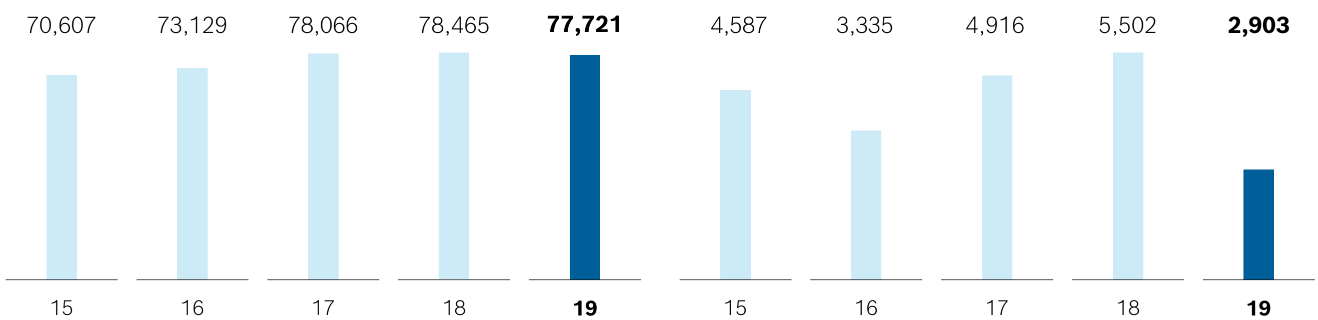
Global carbon neutrality the target for 2020

Having begun back in 2007 to steadily and substantially reduce the relative CO_2 emissions linked to our value creation, we plan to be carbon neutral at all our locations around the world from as early as 2020. Reaching this target will involve buying more green electricity in the near term and using certified compensation measures to offset unavoidable CO_2 emissions. In the years to 2030, we intend to gradually increase the share of renewable energy in the power that we generate and buy. We will also invest significant sums to make our locations more energy efficient.

03 Development of sales revenue and EBIT
Bosch Group, 2015–2019

SALES REVENUE
Figures in millions of euros

EBIT
Figures in millions of euros



Report on economic position

Numerous successful products in the business sectors enabled the Bosch Group to keep sales roughly on a par with the previous year, at 77.7 billion euros, despite a challenging macroeconomic and sector-specific environment. The overall economic cooldown, the sharp fall in global automotive production and especially the weak state of previously high-margin automotive markets such as China and India, the drop in the proportion of newly registered passenger cars fitted with diesel engines, and other changes in our markets all had a negative impact. Besides the further increase in upfront investments in promising areas, the fall in EBIT from operations to 3.3 billion euros following 5.5 billion euros the previous year was chiefly due to the significant slowdown in important automotive markets and to expenses for adjustment measures. The non-recurring effect of the divestment of the packaging machinery business had a positive impact. The fall in the disclosed EBIT figure to 2.9 billion euros also has to be read in the context of an underlying effect in the previous year. Broken down by business sector, Mobility Solutions also succeeded in maintaining sales roughly at the previous-year level despite the steep decline in global automotive production, but nonetheless saw a significant drop in operating income. Sales in the other business sectors also developed modestly. Earnings in Industrial Technology were influenced by the divestment of the packaging machinery business. Consumer Goods posted a slight fall in EBIT from operations, while Energy and Building Technology increased its EBIT from operations significantly year on year.

The Bosch value concept as the basis for control

The Bosch Value Concept pursues Bosch's core objectives of profitable growth and financial independence. This controlling system combines value creation with value preservation. Particularly for an unlisted company such as Bosch, being able to strengthen and maintain profitability over the long term is crucial for financing future growth. The main control parameters for value creation are sales growth, earnings before taxes and before the financial result (EBIT), and – until the end of 2019 – the internal "operating value contribution" indicator. The operating value contribution is calculated analogously to EBIT, but also deducts the imputed cost of capital. Internal reporting is based in principle on International Financial Reporting Standards (IFRS). Until the end of 2019, however, it deviated from external accounting in certain respects, such as recognition of impairment losses and pension provisions, and provisions for losses arising from delivery commitments. We also secure value by closely tracking cost trends and through liquidity management that includes centralized financial planning.

We have further developed our controlling system with effect from the 2020 business year. Net working capital is replacing the operating value contribution, a highly integrated control parameter, as the internal control parameter alongside sales and EBIT. In the future, EBIT will also be calculated directly at division and business unit level. Up to now, this figure was derived from the operating value contribution for the purpose of internal control. This will increase transparency and simplify external benchmark comparisons. The new net working capital performance indicator is designed to highlight the significance of capital tie-up. As an indicator of funds that are essentially tied up in the short term, net working capital is calculated as an average of inventories, receivables, and contract assets minus trade payables and contract liabilities. Additions to non-current assets will continue to be controlled via budgeting for capital expenditure.

A monthly business report containing an up-to-date overview of the main performance indicators of the operating units will remain the central internal reporting instrument. It provides a year-on-year comparison and a target-versus-actual comparison of selected performance indicators. The report is based on the business plan, which is embedded into longer-term strategic corporate planning. The planning methods applied focus on developing and carrying out measures designed to achieve the planning targets. It is a top-down planning model that is strongly geared toward targets and measures. External benchmark comparisons form the basis for setting these targets. We will also use target cost structures derived from benchmarks from 2020 onward.

Until the 2019 business year, the operating value contribution was also used to calculate the earnings targets. These targets form the basis for the short-term variable portion of specialists' and executives' remuneration, from section-manager level to the board of management. This is known as the Bosch performance bonus. In the future, the bonus will depend on the following control parameters: year-on-year organic sales growth (weighted at 15 percent), EBIT margin (weighted at 75 percent), and average net working capital (weighted at 10 percent); these last two indicators are measured as a percentage of sales. The Bosch performance bonus is complemented by VALUE, a variable bonus program for long-term corporate success at senior executive and board of management level, with a time horizon of three years. Its calculation basis will also change with the introduction of the new control parameters.

Macroeconomic and sector-specific environment

Global economy slows significantly

As expected, the global economy cooled further in 2019. One reason is the global trade conflict between the United States and China, in which the two countries have imposed tit-for-tat tariffs, the burdens of which are considerable. Moreover, the slower pace of growth in China had global economic repercussions. In Europe, meanwhile, the persistent uncertainty surrounding the United Kingdom's withdrawal from the European Union curbed economic growth. Our expectation of a marked fall in global economic output in 2019 thus proved correct. That said, at 2.5 percent, the pace of growth was somewhat higher than the 2.3 percent that was forecast. In 2018, global GDP still grew by as much as 3.2 percent.

At a mere 1.2 percent, GDP growth for Europe as a whole lagged well behind the previous-year figure of over 2 percent, as expected. This also applies to the European Union, which posted GDP growth of just 1.2 percent, although its GDP grew 2 percent in the previous year. At just 0.6 percent, the pace of economic growth in Germany slowed more significantly than anticipated. However, we had already expected growth to be lower than 1 percent. This was due in particular to sluggish global trade, which hit Germany's heavily export-oriented industry disproportionately hard. Economic growth in eastern Europe also slowed to just 1.2 percent, compared with 2.5 percent the previous year. This was above all due to the development of the Russian economy, which fell from 2.3 percent in the previous year to 1.3 percent. In additional, preliminary figures suggest that Turkish GDP stagnated, also as a result of the depreciation of the Turkish lira.

Our forecasts were also largely proved correct in the other two major global regions. At 2.0 percent, economic output in the Americas increased somewhat more than the 1.8 percent we predicted. In North America in particular, the economy grew somewhat faster than anticipated, by 2.1 percent (forecast of 1.9 percent). This was mainly due to the U.S., where private consumption in particular developed better than initially forecast. The Mexican economy proved surprisingly weak, however, which can be put down to the uncertainty surrounding the future trade deal between Mexico, the U.S., and Canada. At 0.9 percent, economic growth in South America was only slightly below our modest prediction of just over 1 percent.

Asia Pacific saw the strongest growth in economic output once again, at 4.1 percent, slightly exceeding our estimate of less than 4 percent. Nonetheless, the pace of growth fell further from the 4.4 percent achieved in 2018 and dropped to its lowest level for over ten years. This weakening was caused above all by China's economy slowing to a growth rate of 6.1 percent, compared with 6.8 percent the previous year. However, this means that growth did not slow as severely as initially forecast – we had anticipated a growth rate of well under 6 percent. China's slower growth was influenced primarily by the very high debt levels of state-owned companies, the burdens of the trade conflict with the United States, and the downturn in important industries such as automotive production, which an expansionary economic policy could only partly offset. The Indian economy also performed much more poorly than anticipated. Instead of a forecast figure of 6.3 percent, growth was 5.0 percent. According to the revised figures now available, the economy on the subcontinent had expanded by some 6 percent in 2018. The main cause of this drop was problems affecting the financial system, which drastically curbed lending and impacted negatively on investment activity and the consumption of high-quality consumer goods.

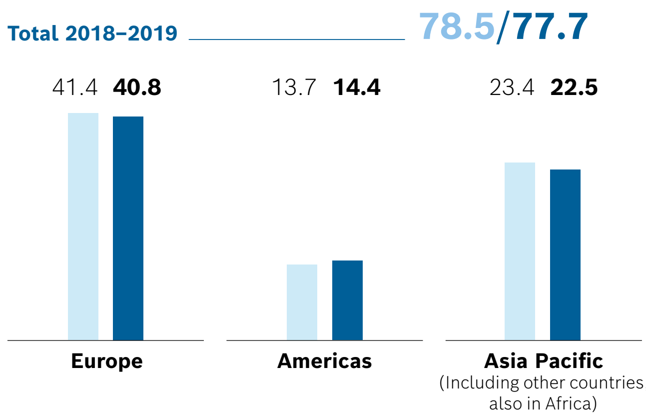
Our most important market, automotive production, performed significantly worse than we had previously anticipated in our planning. Total production of passenger cars and commercial vehicles declined by 5.5 percent year on year to 92.1 million vehicles in 2019, compared with a forecast drop of 3 percent to 94.7 million vehicles. Automotive production has thus contracted for the second consecutive year. At 3 percent, however, the drop in heavy truck production was not quite as severe as the 5 percent that we had forecast. A significant factor in the decline in total production was the slump in production figures in China and, in particular, in India, at 7.6 percent and 13 percent respectively. Production figures also fell 5 percent in the European Union as a whole. The drop in Germany was especially pronounced, at 8 percent. By contrast, product startups meant that production volumes in the central and eastern EU countries exceeded the previous-year figures by 1.7 percent. Automotive production also declined by 3 percent in both North and South America, thus falling short of expectations.

Europe, and Germany in particular, saw a marked divergence between the trends for production and the sale of new vehicles: despite lower production figures, unit sales of passenger cars rose by 1.2 percent in Europe and 5 percent in Germany. The main cause of this divergence is the fall in demand from other countries, with Germany exporting 13 percent fewer passenger cars in 2019 than in the previous year. Another important factor influencing our activities in the Mobility Solutions business sector was the further marked decline in the proportion of passenger cars fitted with diesel engines in Europe and India, our major markets. In terms of sales figures, this share fell further to 31 percent in Europe and 34 percent in India in 2019, compared to previous-year figures of 35 and 38 percent respectively.

Global production in the mechanical engineering sector, another important market segment, also slowed due to the weaker economic environment and sluggish automotive production. Although this affected all regions, the export-dependent mechanical engineering industry in Europe was hit particularly hard. China's mechanical engineering sector benefited from the marked increase in infrastructure investment during the year.

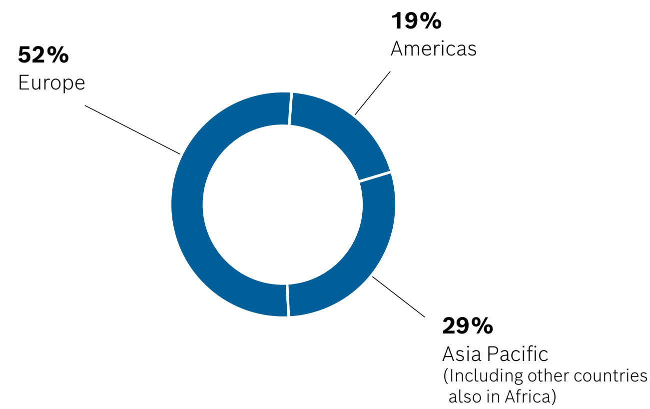
04 Development of sales revenue, 2018–2019
Bosch Group

SALES REVENUE BY REGION
Figures in billions of euros



05 Structure of sales revenue, 2019
Bosch Group

SALES REVENUE BY REGION
Percentage figures



Business developments

Nearly constant sales in a challenging environment

The Bosch Group generated sales revenue of 77.7 billion euros in 2019. Despite significant market setbacks, therefore, this almost matched the previous-year figure of 78.5 billion euros. Sales revenue fell by just 0.9 percent, and 2.1 percent after adjusting for exchange-rate effects. Our cautious forecast for 2019 had predicted that sales revenue would match the previous-year level or increase only slightly. Given the market environment, which was much tougher than anticipated, the development of sales has to be regarded as a success. In the main, our sales revenue forecasts for the business sectors also proved accurate. The positive impact of exchange rates amounted to 0.9 billion euros. In 2019, these were primarily due to the euro's performance against the U.S. dollar, the Japanese yen, and the Chinese renminbi. There were no significant consolidation effects for the 2019 business year. As with all income statement items, the figure for 2019 sales revenue includes the activities of Robert Bosch Packaging Technology GmbH that were sold effective December 31, 2019. This entity has now been renamed Syntegon Technology GmbH, and is based in Waiblingen, Germany.

Performance varies by region

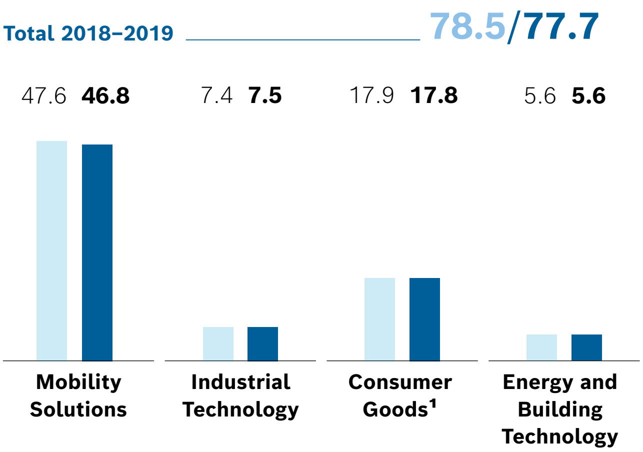
In Europe, despite the weak economy and the fall in automotive production, we succeeded in achieving sales of 40.8 billion euros. Sales thus dropped by 1.4 percent in 2019, or by 1.2 percent after adjusting for exchange-rate effects. In Germany, sales fell 2.4 percent to 15.7 billion euros. The steepest drops in sales were posted in Sweden, Italy, and Belgium.

In the Americas, sales came to 14.4 billion euros in 2019, 5.3 percent up on the previous year (1.1 percent after adjusting for exchange-rate effects). In North America, we increased sales revenue by a nominal 5.9 percent to 13.0 billion euros. However, it rose by 0.6 percent after adjusting for exchange-rate effects. All business sectors increased their sales revenue in this region, especially Consumer Goods and Energy and Building Technology. In South America, sales revenue climbed to 1.4 billion euros, an increase of 0.1 percent in nominal terms and 6.0 percent after adjusting for exchange-rate effects. This was driven by increased sales in Mobility Solutions and Industrial Technology.

The Bosch Group also felt the effects of the marked economic slowdown in Asia Pacific (including other countries, also in Africa) and, in particular, the steep drop in automotive production in China and India. This drop could not be offset by the positive sales trend in Japan and the ASEAN countries. Sales revenue dropped by 3.7 percent to 22.5 billion euros, or 5.4 percent after adjusting for exchange-rate effects. At 541 million euros, sales revenue in Africa was down slightly on the previous-year figure of 556 million euros.

06 Development of sales revenue, 2018–2019
Bosch Group

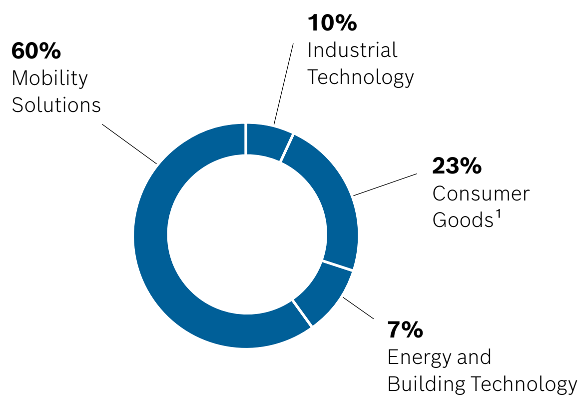
SALES REVENUE BY BUSINESS SECTOR
Figures in billions of euros



1. Including other activities

07 Structure of sales revenue, 2019
Bosch Group

SALES REVENUE BY BUSINESS SECTOR
Percentage figures



1. Including other activities

There were shifts in the regional sales structure on account of the downward trend in Europe and Asia Pacific. The share of sales generated in Europe fell by one percentage point to 52 percent, with the share generated by Germany falling 0.3 percentage points to 20.2 percent. The share of sales generated in the Americas increased by 2 percentage points to 19 percent. The figure for Asia Pacific, however, fell one point to 29 percent.

Subdued development of business sectors
All business sectors reported a fairly modest sales trend, with only slight shifts in their shares of total sales. The share of Mobility Solutions fell one point to 60 percent, while the share of Industrial Technology increased by the same amount.

Mobility Solutions holds its own
Despite automotive production falling more sharply than anticipated worldwide, Mobility Solutions – our biggest business sector – posted sales revenue of 46.8 billion euros. This was only 1.6 percent lower than the previous year, or 3.1 percent after adjusting for exchange-rate effects. In the powertrain technology business, however, we were affected not only by the downward trend in global production figures, particularly in China and India, but also by the continued fall in demand for diesel passenger cars in Europe and India. The shift to a new generation of gasoline direct injection systems was a further influencing factor. These losses could not be offset by increased sales in electrification, transmission control, and fuel supply.

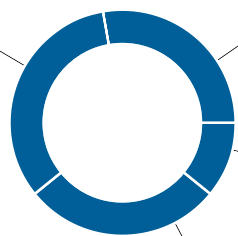
The Chassis Systems Control division continued to see a pleasing level of demand for modern driver assistance systems. We were also successful once again with active and passive safety systems, such as ABS and ESP®, although the weak Chinese market dampened developments here as well. The challenging market situation in China also eroded sales revenue in the Automotive Steering and Electrical Drives divisions. By contrast, the Car Multimedia division increased sales significantly in its display and infotainment system business. The Automotive Aftermarket division also posted respectable sales growth, despite being likewise affected by the weak Asia Pacific market. In the Automotive Electronics division, the drive-systems and control-unit business for e-bikes was again very successful. In addition, Bosch Sensortec recorded a further increase in sales to customers from the consumer electronics segment. The control-unit and sensor business with external customers from the automotive sector also grew significantly. Our software specialists in the ETAS Group recorded a pleasing level of growth. Our subsidiary Bosch Engineering – including the ITK Engineering unit – also increased sales revenue despite a tougher market environment in the second half of the year. The Commercial Vehicles and Off-Road unit, which was incorporated into Bosch Engineering at the start of 2019, also contributed to this result. Sales in the Connected Mobility Solutions division remained on a low level. The Two-Wheeler and Powersports unit performed very well once again.

Slowdown affects Industrial Technology
Despite the marked slowdown in the mechanical engineering market over the course of 2019, the Industrial Technology

08 Associates
Bosch Group 2019 (year-end figure)

BY REGION

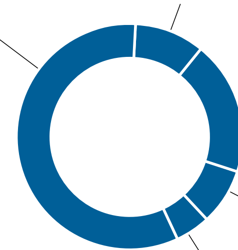
Total 398,150



09 Associates
Bosch Group 2019 (year-end figure)

BY BUSINESS SECTOR

Total 398,150



1. Corporate functions and research

business sector posted sales revenue of 7.5 billion euros, slightly higher than the previous-year figure of 7.4 billion euros. Nominally, revenue grew marginally by 0.7 percent, while the exchange rate-adjusted figure fell 0.4 percent. Within the Drive and Control Technology division, growth in the mobile hydraulics business outstripped that in industrial hydraulics. The effects of the economic cooldown were already clearly in evidence in the factory automation business. The packaging machinery business, which is included in the sales figures for the last time, enjoyed a positive trend in sales revenue.

Consumer Goods business picks up during the year
Sales revenue in the Consumer Goods business sector (without other activities) fell by a nominal 0.3 percent to 17.8 billion euros in 2019, or by 0.8 percent after adjusting for exchange-rate effects. While the Power Tools division increased its sales revenue, especially from measuring equipment and accessories, sales at BSH Hausgeräte were down year on year. Following a weak first half of the year, however, the household appliance specialist significantly improved its sales in the second six months. This was particularly the case in China, where competition has grown fiercer in terms of the speed of innovation, the trading environment, and a slower market overall.

Slight growth in Energy and Building Technology
The Energy and Building Technology business sector increased its total sales by 1.5 percent to 5.6 billion euros. This translated into an increase of 0.8 percent after adjusting for exchange-rate effects. Both Building Technologies and Thermotechnology grew their sales moderately. Compared with the previous year, Building Technologies felt the effects of the drop in economic momentum in its product business above all, while Thermotechnology saw demand dip on a regional level in both the United Kingdom and other western European markets. The Bosch Global Service Solutions division achieved pleasing sales growth in 2019.

Headcount

Worldwide reduction
The total number of Bosch Group associates fell to some 398,200 at the end of 2019, compared with roughly 409,900 at the end of 2018. The figures at year-end 2019 take account of the divestment of the packaging machinery business with its approximately 6,100 associates. In 2019, net consolidation effects amounted to some 5,000 associates in total, with the incorporation of smaller companies having a countervailing effect. Total headcount thus fell by some 6,700 associates worldwide after accounting for consolidation effects.

The percentage distribution of associates by region remained unchanged compared with the previous year. At the end of 2019, a total of around 242,500 associates were employed by the Bosch Group in Europe, compared with some 250,000 at the end of 2018. The divestment of the packaging machinery business and personnel adjustment measures caused headcount in Germany to fall to roughly 132,700 associates, compared with some 139,400 the previous year. Over the same period, the number of associates in Asia Pacific, including other countries (also in Africa), dropped to approximately 111,700 from roughly

01 Most important items of the income statement
Figures in millions of euros

	2019	2018
Sales revenue	77,721	78,465
Cost of sales	–53,236	–51,696
Gross profit	**24,485**	**26,769**
Distribution cost and administrative expenses	–16,262	–15,308
Research and development cost	–6,079	–5,963
Other operating income and expenses	766	18
Result from companies included at equity	–7	–14
EBIT	**2,903**	**5,502**
Financial result	353	–435
Profit before tax	**3,256**	**5,067**
Income tax expense	–1,196	–1,493
Profit after tax	**2,060**	**3,574**

114,800, due in particular to adjustment measures in China in the Mobility Solutions business sector and at BSH Hausgeräte. Giving permanent contracts to previously fixed-term associates in Malaysia and Vietnam had a countervailing effect. In Africa, the number of associates at consolidated companies remained largely unchanged, at around 1,800. Headcount in the Americas fell slightly to 43,900, compared with 45,100 the previous year. It stood at roughly 34,600 in North America at the end of 2019, slightly below the previous-year level of some 35,400, and fell by some 400 in South America to approximately 9,300.

In terms of business sectors, the workforce structure changed slightly year on year. The Mobility Solutions business sector's share now stands at 60 percent, compared with 58 percent the previous year, while the Industrial Technology business sector's share fell to 8 percent, compared with 10 percent the previous year. Consumer Goods continues to account for 19 percent, Energy and Building Technology for 8 percent, and other activities for 5 percent.

The workforce in the Mobility Solutions business sector shrank slightly to approximately 236,700, compared with 237,100 at the end of 2018. While there was some downsizing in divisions such as Powertrain Solutions, Automotive Aftermarket, Automotive Steering, and Electrical Drives, we created new jobs in growth areas such as driver assistance systems, automated driving, and software. The number of associates in the Industrial Technology business sector dropped to some 33,200, compared with 40,700 at the end of 2018. This is due to the divestment of the packaging machinery business and adjustment measures in the Drive and Control Technology division. The number of associates in the Consumer Goods business sector declined to roughly 76,600, compared with 79,200 at the end of 2018. This was driven primarily by personnel adjustments at BSH Hausgeräte, chiefly in China. At around 33,200, the number of associates in the Energy and Building Technology business sector is roughly 700 higher than in the previous year. Some 18,600 associates are employed in other activities, approximately 1,800 fewer than in the previous year. The main reason for this is organizational reassignments.

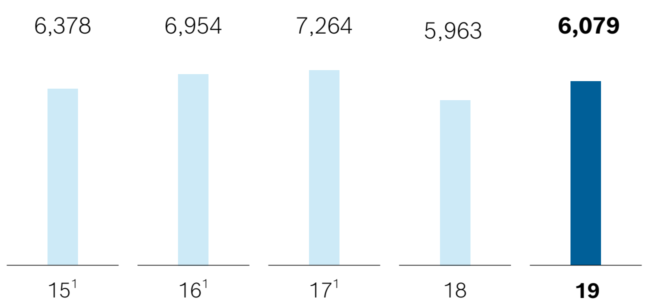
Across all units worldwide, the number of associates in research and development grew further to roughly 72,600, compared with 68,700 at the end of the previous year. The global research and development network grew especially strongly in Asia Pacific. Many new jobs were also created in Europe, and in particular in Germany. Regions outside Germany now account for 57 percent of associates in research and development, with 38 percent working in Asia Pacific. The number of associates in the corporate sector for research and advance engineering ("Other activities") rose slightly to some 1,450, compared with approximately 1,400 the previous year.

Results of operations

Bosch Group's result declines
We report EBIT for 2019 of 2.9 billion euros, compared with 5.5 billion euros the previous year. The previous-year figures included a non-recurring special effect of around 430 million euros due to the changed reporting of the company pension scheme with regard to additional benefits in the event of dis-

10 Research and development cost
Bosch Group, 2015–2019

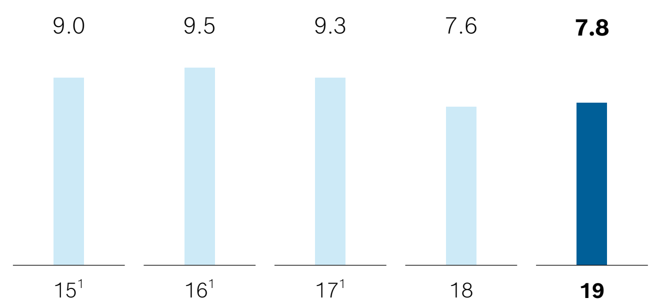
TOTAL EXPENDITURE
Figures in millions of euros



1. Including development work charged directly to customers

11 Research and development cost
Bosch Group, 2015–2019

TOTAL EXPENDITURE
as a percentage of sales revenue



1. Including development work charged directly to customers

ability and death. This had a positive effect on all functional-cost categories in the 2018 income statement.

The Bosch Group's EBIT from operations dropped to 3.3 billion euros in 2019 (previous year 5.5 billion euros). The margin from operations fell from the previous-year figure of 7.0 percent to 4.2 percent. The fall was thus more substantial than had been anticipated. There were further increases in upfront investments for promising areas, which concerned research and development costs as well as depreciation of property, plant, and equipment. Furthermore, although we had already anticipated a fall in automotive production, it turned out to be much sharper than our planning had predicted. An important factor in this is the unsatisfactory state of previously high-margin automotive markets and segments such as China, India, and diesel passenger cars. This calls for restructuring measures, which generate significant expenses, especially in the Mobility Solutions business sector. The impact of this was manifested in various income statement items. Falling income in the consumer goods sector also had an adverse effect on the overall result, albeit to a lesser extent. Running counter to this were positive non-recurring effects, mainly due to the divestment of the packaging machinery business. Without non-recurring effects, the margin from operations is 3.5 percent. As in previous years, the calculation of EBIT from operations disregards the earnings impact of higher depreciation and amortization from the remeasurement of assets at Automotive Steering and BSH Hausgeräte, following the complete acquisition of these former joint ventures in 2015. These effects came to around 380 million euros in 2019, and were slightly lower than the same effects in the previous year.

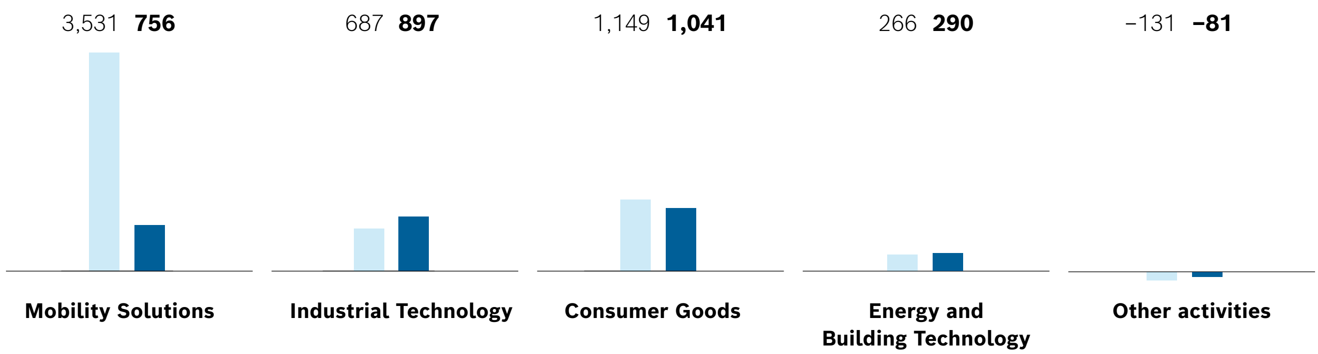
In 2019, cost of sales rose 3.0 percent to 53.2 billion euros. The gross margin thus fell to 31.5 percent of sales, compared with 34.1 percent the previous year. At roughly 3.4 billion euros, depreciation of property, plant, and equipment was some 10 percent higher than the previous-year level of 3.1 billion euros. Administrative and distribution cost rose 6.2 percent year on year.

Research and development cost came to 6.1 billion euros in 2019, and research and development intensity to 7.8 percent. This compares with 6.0 billion euros and 7.6 percent respectively the previous year. The drop from 2017 to 2018 is the result of the first-time application of IFRS 15. Up to 2017, research and development cost still contained development work charged directly to customers.

The Mobility Solutions business sector again accounted for the largest share in 2019, at 72 percent (previous year 75 percent). Important areas include upfront investments in electrification, driver assistance systems, including automated driving, display and infotainment systems, and sensors. The rise in upfront investments in this business sector also reflects the growing complexity of many projects, particularly in automotive electronics. The percentage attributable to the Consumer Goods business sector (including other activities) came to 16 percent (previous year 14 percent), and remained at 7 percent in the Industrial Technology business sector. The corresponding figure in Energy and Building Technology climbed to 5 percent (previous year 4 percent).

12 EBIT
Bosch Group, 2018–2019

BY BUSINESS SECTOR
Figures in millions of euros



The positive balance in other operating expenses and income is mainly the result of non-recurring effects, above all from the sale of the packaging machinery business.

The positive financial result amounts to 353 million euros in 2019, compared with a negative balance of 435 million euros the previous year. This improvement is mainly reflective of positive developments in investment funds. Profit before tax thus totaled 3.3 billion euros, corresponding to a margin of 4.2 percent. Both figures are down significantly on their previous-year levels of 5.1 billion euros and 6.5 percent respectively. The result after tax amounts to 2.1 billion euros, compared with 3.6 billion euros the previous year.

Our internal control parameter, the operating value contribution, is calculated only for the consolidated group used in internal reporting in 2019. It too lagged behind expectations, and was negative at around minus 70 million euros, from the comparable figure of roughly 1.6 billion euros in 2018. The fundamental difference between EBIT and the operating value contribution is the imputed 3.8 billion-euro (comparable prior-year figure: 3.6 billion-euro) cost of capital, which reduces the operating value contribution compared with EBIT.

All units contributed to result

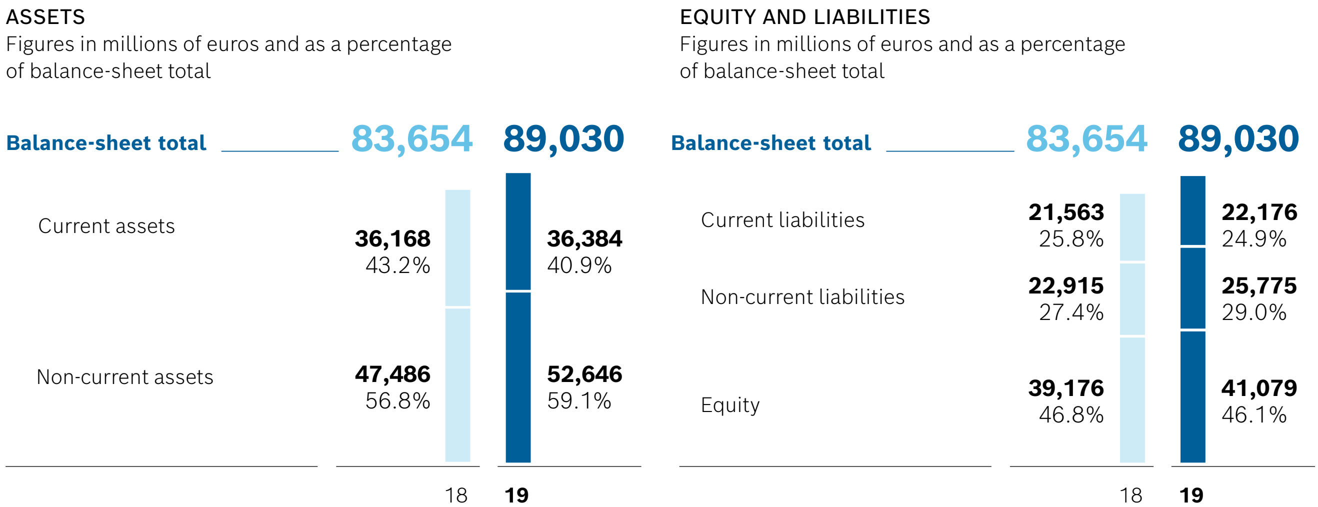
In 2019, all business sectors achieved a positive result in line with expectations. In all segments, the figures for 2018 were impacted by the above-mentioned non-recurring special effect due to the changed reporting of the company pension scheme with regard to additional benefits in the event of disability and death. However, this is not considered in the result from operations. As in previous years, moreover, the calculation of EBIT from operations for the Mobility Solutions and Consumer Goods business sectors disregards the earnings impact of higher depreciation and amortization from the remeasurement of assets at Automotive Steering and BSH Hausgeräte, following the complete acquisition of these former joint ventures in 2015.

EBIT in the Mobility Solutions business sector fell from 3.5 billion euros the previous year to 756 million euros. This was driven by the further increase in upfront investments and, in particular, by the fall in sales due to the weakness of high-margin markets and segments, as well as by significant restructuring expenses. EBIT from operations came to 887 million euros, compared with the previous-year figure of 3.4 billion euros. The margin from operations dropped to 1.9 percent, compared with 7.1 percent the previous year. Earnings thus fell even more sharply than initially anticipated.

Including the non-recurring effect from the divestment of the packaging machinery business, the Industrial Technology business sector generated EBIT of 897 million euros, compared with EBIT of 687 million euros and EBIT from operations of 627 million euros the previous year. Disregarding the non-recurring effect from the sale of the packaging machinery business, the business sector achieved a margin from operations of 7 percent, compared with 8.4 percent the previous year.

13 Structure of the statement of financial position

Bosch Group, 2018–2019



The Consumer Goods business sector reports EBIT of 1.0 billion euros, compared with 1.1 billion euros the previous year. EBIT from operations came to 1.3 billion euros, following 1.4 billion euros the previous year, while the margin from operations stood at 7.3 percent, compared with 7.8 percent in 2018. The Power Tools and, in particular, BSH Hausgeräte divisions felt the effects of a tougher market in 2019. The Energy and Building Technology business sector posted EBIT of 290 million euros, compared with 266 million euros (236 million euros from operations) the previous year. Its margin rose significantly to 5.1 percent, compared with 4.2 percent from operations in 2018.

Net assets and financial position

High equity ratio and healthy balance sheet

The Bosch Group balance-sheet total as of the 2019 reporting date stood at 89.0 billion euros, significantly exceeding the previous year's level of 83.7 billion euros. It should be noted that the first-time application of IFRS 16 "Leases" resulted in a positive effect of 2.1 billion euros. The divestment of the packaging machinery business, which already has to be taken into consideration in the balance-sheet figures for 2019, had a countervailing effect. The equity ratio fell slightly to 46 percent, compared with 47 percent the previous year.

On the assets side, our liquidity as reported in the statement of financial position rose significantly to 19.0 billion euros as of the reporting date, compared with the previous year's 16.5 billion euros. Apart from cash and cash equivalents, liquidity as per the statement of financial position includes marketable securities and bank balances with a term of more than 90 days. The main reasons for these positive changes were increases in the market value of securities. The liabilities side saw changes mainly due to an increase in pension provisions, largely caused by actuarial effects.

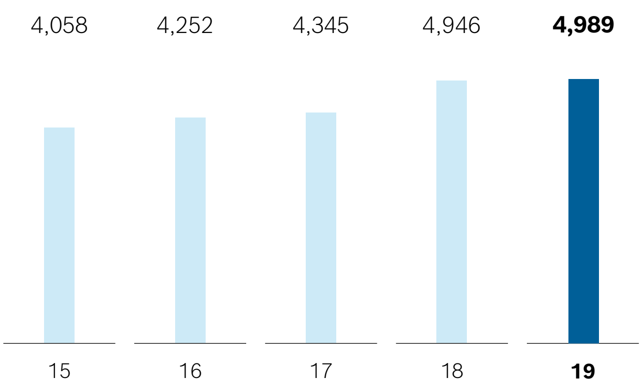
Our financing structure is thus very sound. In 2019, Standard & Poor's put Robert Bosch GmbH's long-term rating at AA-, although its outlook was downgraded to "negative." The financial liabilities of the Bosch Group include bonds with a nominal value of 3.0 billion euros. The interest rates are between 1.625 percent and 4.375 percent. The average interest rate has fallen to 2.185 percent in comparison with the previous-year rate of 2.440 percent. The bonds' average residual term to maturity is 6.33 years, compared with 6.72 years the previous year. Most of the existing financial liabilities are denominated in euros. No significant debts were incurred, or bonds issued. By contrast, there were repayments of bonds and medium-to long-term loans to Robert Bosch GmbH totaling some 450 million euros and to its subsidiary BSH Hausgeräte totaling 100 million yuan; full or partial repayments of euro-denominated loans were also made, amounting to some 57 million euros in total.

High level of capital expenditure sustained

At roughly 5.0 billion euros in 2019, capital expenditure slightly exceeded the previous-year level of 4.9 billion euros. The investment ratio thus rose to 6.4 percent of sales, compared with

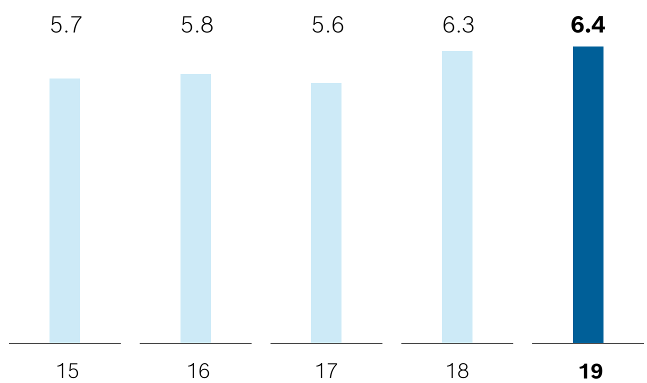
14 Capital expenditure on property, plant, and equipment
Bosch Group, 2015–2019

CAPITAL EXPENDITURE
Figures in millions of euros



15 Capital expenditure on property, plant, and equipment
Bosch Group, 2015–2019

CAPITAL EXPENDITURE
as a percentage of sales revenue



6.3 percent in the previous year. As of the reporting date, existing investment commitments as a result of orders already placed totaled roughly 542 million euros, following a previous-year figure of 895 million euros. Thanks to our very good liquidity position, we have ample financial resources at our disposal.

Broken down by business sector, capital expenditure in Mobility Solutions was on a par with the previous year, at 3.8 billion euros. It was focused on investments in gasoline direct injection systems, the iBooster, the integrated power brake, the ABS and ESP® braking systems, autonomous driving, and, in particular, the new wafer fab in Dresden and additional capacity upgrades to automotive electronics operations in Reutlingen and various other European and international locations. Capital expenditure in Industrial Technology increased to some 251 million euros, compared with 233 million euros the previous year, and included investments in new manufacturing facilities for linear motion technology in China. In the Consumer Goods business sector, capital expenditure was 759 million euros, compared with around 781 million euros in the previous year. Important BSH Hausgeräte projects in 2019 were, once again, the new dishwasher factory and the engineering center for tumble dryers in the Polish city of Łódź, and the new refrigerator factory in India. The subsidiary also invested in new generations of washing machines in Çerkezköy in Turkey. In Energy and Building Technology, capital investment came to approximately 116 million euros, compared with 114 million euros the previous year. This again mainly concerned cost-reduction and product-renewal projects at manufacturing, engineering, and sales locations.

From a regional viewpoint, we invested 3.0 billion euros in our European locations, as in the previous year. Capital expenditure in Germany amounted to roughly 1.7 billion euros, compared with 1.8 billion euros the previous year, with the future wafer fab in Dresden again representing the largest single investment in 2019. We also invested heavily in other European locations. In Hungary, this related in particular to expanding manufacturing for power electronics at our Hatvan location and construction work at our engineering center in Budapest. At our Miskolc location, we invested in new buildings to expand manufacturing capacity for the battery packs used in garden tools, professional tools, and e-bikes. We expanded capacity in Poland, focusing on household appliances, as well as in the Czech Republic at the České Budějovice location (exhaust-gas treatment systems), and in Romania at the Cluj location (automotive electronics). In western Europe, our location in Braga, Portugal, which manufactures head-units and automotive display systems, among other things, was again a focal point of our investments. We also made investments in Turkey, at the automotive location in Bursa and at BSH Hausgeräte. Apart from these specific cases, capital expenditure was again broadly distributed in 2019.

We invested 1.5 billion euros in Asia Pacific, compared with 1.4 billion euros the previous year. The main recipient of this was China, where we invested heavily in the Mobility Solutions business sector, focusing particularly on gasoline direct injection systems and on electromobility components and systems. We also made investments in the new BSH Hausgeräte tumble dryer and washing machine factory in Chuzhou, as well as in

02 Bosch Group, statement of cash flows

Figures in millions of euros

	2019	2018
Cash flow	**6,971**	**7,026**
as a percentage of sales revenue	**9.0**	**9.0**
Liquidity at the beginning of the year (January 1)	4,716	4,543
Cash flows from operating activities	+6,559	+7,267
Cash flows from investing activities	–5,113	–6,110
Cash flows from financing activities	–1,671	–1,019
Other activities	+67	+35
Liquidity at the end of the year (December 31)	**4,558**	**4,716**

linear motion technology for the Drive and Control Technology division in Xi'an. Development activities at the Bengaluru location were a focal point in India. We also made significant investments in Vietnam, where we manufacture push belts for continuously variable transmission units at our Long Thanh location near Ho Chi Minh City.

We invested a total of some 440 million euros in the Americas, compared to around 470 million euros in the previous year. The Mobility Solutions business sector accounted for most of this activity. In the United States, this again included the Charleston, Anderson, and Florence manufacturing sites in South Carolina, as well as a number of locations in Mexico. We also expanded our capacities for power tools, specifically circular saw blades, in Lincolnton, North Carolina.

Liquidity

Good liquidity position

Despite lower EBIT, the Bosch Group has a strong financial position. In 2019, cash flow remained on its previous-year level of 7.0 billion euros or 9.0 percent of sales. Liquidity at year-end as per the consolidated statement of cash flows (cash and cash equivalents) stood at 4.6 billion euros, compared with 4.7 billion euros the previous year. In addition, financing of 1 billion euros and of 2 billion U.S. dollars is available to the Bosch Group under its commercial-paper programs.

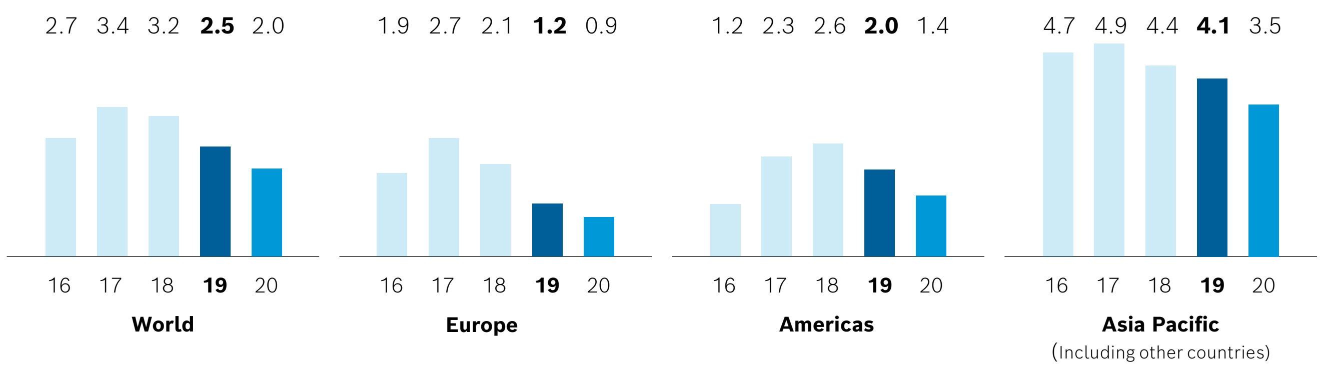
Cash flows from operating activities fell to 6.6 billion euros, compared with 7.3 billion euros the previous year. Cash flows from investing activities amounted to 5.1 billion euros, and were down on the previous-year figure of 6.1 billion euros. Cash flows from financing activities, including repayments of lease liabilities, disclosed an outflow of 1.7 billion euros in 2019, as opposed to an outflow of 1.0 billion euros the previous year. As in the previous year, no new long-term debts were incurred in 2019.

The Bosch Group has a central financial and currency management system. This is designed to control payment flows to optimum effect and limit the risks of currency exposures at the Bosch Group level. Central financial management also manages our borrowings and investments. Our investment strategy is aimed at broad diversification of shares and interest-bearing securities.

16 Regional economic growth 2016–2020

REAL GDP, PERCENTAGE CHANGE ON PREVIOUS YEAR
Percentage figures

Forecast



Some figures changed from 2018 annual report following revisions to previous-year data

Outlook

Difficult economic conditions
At present, we expect global economic output to grow only weakly in 2020. Global commerce is feeling the burden of a series of trade conflicts. Moreover, the slower pace of growth in China is having global economic repercussions. Our plans assume that global economic output will grow by just 2.0 percent. In other words, we expect momentum to continue to weaken year on year. This would mean the weakest global economic growth since the 2009 crisis. The global spread of coronavirus also suggests that growth momentum will weaken further. However, reliable estimates of its effects on business activity cannot be made at the time of this forecast, which is why our forecast data do not yet take it into consideration.

In terms of the major economic regions, our expectation is that growth in the Americas will fall significantly year on year, to just over 1.5 percent. Europe as a whole will likely grow equally as weakly as in the previous year, with GDP forecast to increase by just under 1 percent. Current forecasts suggest that growth in Asia Pacific will slow further, to 3.5 percent. In China, we are presently forecasting growth of 5 percent. In India, we do not expect the pace of economic activity to pick up before the end of the year. For this reason, we once again expect growth to be weak compared with previous years, at 5.3 percent.

In Europe, our assumption for the European Union is that the growth rate will be 0.8 percent in 2020, and thus similarly as weak as in 2019. This is also due to the very slow pace of developments in the highly export-dependent German economy, which we expect to grow by just 0.3 percent. Moreover, the weakness of the German economy is increasingly affecting the eastern European economies, which are closely interwoven with Germany's export industry. In the United Kingdom, which left the European Union at the end of January 2020, it is likely that business activity will suffer as a result of the adjustments that will have to be made to trading relationships, even though these will only happen gradually. In Turkey, the slow return to economic normality will likely continue, with value creation growing 2.3 percent. However, this is still far removed from the strong growth of earlier years. In Russia as well, we expect the pace of economic growth to be only low. This is mainly attributable to low raw materials prices in light of weak global economic growth. As a result of this, important stimuli for the Russian economy are missing.

In North America, we forecast weaker year-on-year growth of 1.4 percent. Among other things, this reflects the dwindling positive effects of the U.S. tax reform in 2018. On top of this, there is the impact of the trade dispute between the United States and China. In South America, we expect economic growth to be just 1.5 percent, also as a result of political tensions.

The prospects for automotive production, our most important market, are unsatisfactory. As things stand, we expect the fall in total production of passenger cars and commercial vehicles to continue, with a 3.7 percent drop to 88.7 million vehicles. Automotive production will thus fall for the third consecutive year, and will likely be lower that its 2014 level. This figure already takes account of the lowered expectations for China, based on an initial assessment of the effects of the coronavirus epidemic. At the time of writing this forecast, further effects cannot be sufficiently quantified. We are preparing various scenarios. Moreover, there are already signs that production of heavy trucks could fall by 11 percent. In 2020, the expected decline in China and India is once again a significant factor in the development of production figures. However, we expect to see lower volumes in nearly all other countries with major automotive industries. Growth is only expected in South America, Africa, and ASEAN.

Challenging business outlook
The weak global economy, and especially the likelihood that important market segments such as automotive production and mechanical engineering will develop unsatisfactorily, will likely have a negative effect on the Bosch Group's business prospects for 2020. At the time of drawing up our forecast, the impact of production stoppages due to the coronavirus epidemic in China and their repercussions for our business development cannot be reliably estimated. This impact also depends on how things develop globally.

Independently of this, our expectation for the Bosch Group so far is sales revenue of approximately 76 billion euros, without the consolidation effects resulting from the sale of our packaging machinery activities. This would be slightly below the previous-year level, and does not take exchange-rate effects into account. For our Mobility Solutions business sector, we currently expect to see sales develop in a similar way. Even without the baseline effects from the sale of Packaging Technology, Industrial Technology will have to steel itself for a more than 7 percent drop in sales revenue as a result of market weakness. In Consumer Goods, we expect sales to fall roughly 1 percent, while the sales of Energy and Building Technology are expected to grow by a similar amount.

As concerns our EBIT margin from operations, our aim so far for 2020 is for it to be on a par with the previous year. The basis for comparison is the margin for 2019 without non-recurring effects – 3.5 percent, in other words. Apart from weak markets, we once again expect our result to be burdened by our upfront investments in areas of future importance and by necessary adjustment measures. And while our planning foresees significant improvements in the margin from operations in the Mobility Solutions business sector, this figure will worsen significantly in Industrial Technology. Our present expectation is that the margin from operations in Consumer Goods and Energy and Building Technology will be roughly the same as in the previous year. These forecasts for the business sectors are also based on the 2019 values, net of non-recurring effects. In 2020, we want to slightly improve net working capital as a percentage of sales, our new internal performance indicator, from its comparable previous-year level of 27.4 percent for the Bosch Group as a whole. We expect to see a considerable improvement in Industrial Technology, a slight one in Consumer Goods and Energy and Building Technology, and no change in Mobility Solutions.

Report on opportunities and risks

Opportunities
For further explanations, see the "Prospects for the Bosch Group" section, which describes in detail the opportunities arising from the market environment, our strategy, and our innovations, both for the company as a whole and its business sectors.

Risk report

Comprehensive risk management system
In the Bosch Group, risk management encompasses the entire company, including all operations, functional areas, divisions, regional organizations, and business sectors. It is thus a core responsibility for all managers on every level of the Bosch Group. As a rule, responsibility for risk management is assumed locally on all group management levels, with certain governance tasks being organized at corporate level. This means that risks are identified and managed where they arise: in other words, above all in the divisions and regional organizations. The latter are also primarily responsible for introducing measures to reduce or control risks. In addition, corporate departments for areas such as compliance management, legal services, tax, and the corporate office for the risk management system support, direct, and monitor the operating units' control activities. Internal auditing, which acts as an independent authority and also reports directly to the managing partners of Robert Bosch Industrietreuhand KG, has responsibilities including assessing the appropriateness and effectiveness of the tasks described and, if necessary, initiating remedial measures.

The corporate coordinating office for the risk management system is responsible for making risk management fit for the growing tasks ahead. In 2019, this included the preparation and publication of a risk management directive, which is applicable to the whole Bosch Group worldwide and will be enforced in full in 2020. This directive serves to ensure greater clarity regarding basic principles and responsibilities. The corporate coordinating office also began introducing a new, standardized electronic risk information system across the Bosch Group in 2019, which helps risks to be recorded and analyzed and improves transparency. This work also involved further developing the methodology for assessing risk. In addition, a new, cross-functional risk committee is tasked with identifying significant risk areas across the divisions and analyzing disruptive technological and strategic risks.

Overall risk assessment

We are not currently aware of any risks beyond the economic and political risks mentioned in the outlook above, the risks of the business sectors listed in this report, and litigation risks, which could materially affect the net assets, financial position, and results of operations of the Bosch Group in 2020. There are no risk exposures that could jeopardize the Bosch Group's continued existence as a going concern.

Impact of the coronavirus epidemic

The global spread of the coronavirus suggests there will be significantly negative effects on the pace of global economic growth, and especially on our markets. The burdens on supply chains and production will likely be appreciable, and make themselves felt in our sales revenue and result. To limit the risk, we have set up a crisis management team that is keeping close track of developments and arranging for appropriate measures to be taken, above all to protect our workforce and secure supplies to customers. At the time of drawing up our forecast, the possible effects of the coronavirus epidemic on the development of our business cannot be reliably estimated.

Analysis of medium-term risks

The number of risks identified by the divisions has increased as the risk management system has been modified, and responsibilities have been made more precise, such as including IT risks fully in the assessment methodology for the first time. Assessments are now based on the "potential scale of loss" indicator. The risk matrix has also been enhanced accordingly and now combines the potential scale of loss with the probability of occurrence. The potential scale of loss is based on a three-point estimate for the worst-case, realistic, and best-case scenarios, in a ratio of 1:4:1. We have six categories of potential scale of loss: up to 5 million euros, over 5 and up to 25 million euros, over 25 and up to 50 million euros, over 50 and up to 100 million euros, over 100 and up to 250 million euros, and over 250 million euros. We have also switched to five categories of probability of occurrence: up to 5 percent, over 5 and up to 20 percent, over 20 and up to 50 percent, over 50 and up to 75 percent, and over 75 percent. Risks with a probability of occurrence of at least 50 percent are still considered in our annual or interim sales and income forecasts as a matter of principle. The assessment is based on our current planning.

The Bosch Group's largest single risks classified as particular risks (with a potential scale of loss of more than 250 million euros and a probability of occurrence of at least over 20 and up to 50 percent) are attacks on its core IT processes and, increasingly, its connected products as well as data protection risks. This risk group also includes potential insolvency or bankruptcy proceedings brought against critical suppliers, particularly in the Mobility Solutions business sector and – the largest operational risk – a further fall in sales in the Powertrain Solutions division (the group's largest contributor in terms of sales) beyond the level already anticipated in the business plan for 2020 and subsequent years.

We have a comprehensive IT strategy in place to combat IT and data protection risks. This is because a systems failure as a result of external attacks or internal errors can lead to considerable problems in product development, product manufacturing, and the continued operation of software products as well as administrative processes, resulting in significant financial losses. We have put in place comprehensive measures, valid throughout the company, to provide organizational and technical protection against system outages, data loss, and data manipulation. For the operation of our computing centers, we apply an integrated security concept, which we continuously update using state-of-the-art technology. We verify its effectiveness with extensive security tests, among other things, and certify it according to an independent information security standard. For our IT infrastructure, a high level of availability is achieved by providing a redundant, location-independent systems architecture. We also work constantly on improving our network security.

Risks from the use of software-based products and solutions on the internet of things (IoT) arise from connected hardware products, software, or data being misused or wrongly used with respect to intellectual property protection or data privacy in an environment that is becoming ever more complex, especially in public cloud environments. As with IT risks, there is a risk of external attacks on connected hardware products. Our group-wide security engineering process works on avoiding these risks and ensures that the product design process also considers security aspects right from the outset. We are also addressing the issue of security vulnerabilities in products by upgrading the update capability of Bosch products. Furthermore, we are devising a group-wide data strategy that lays down uniform rules for the responsibilities and processes involved in handling data. In addition, liability risks arise in connection with the outage or disruption of complex systems relating to our products and services, such as manufacturing equipment that is a part of Industry 4.0 solutions and components for automated driving. To reduce these risks, we conclude appropriate agreements with our customers on terms of use and limitations on liability.

We limit the risk of the insolvency or bankruptcy of critical suppliers, particularly in the Mobility Solutions business sector, through extensive monitoring of our suppliers' commercial situation by our purchasing and logistics units as well as detailed, regular reporting to the chief financial officer. We are making efforts to counter the operational risk in the Powertrain Solutions division by publicly promoting a fact-based discussion of the subject of diesel technology and with our commitment to pursuing technology-neutral powertrain development, which also encompasses renew-able synthetic fuels. This is in addition to extensive performance management measures in the Mobility Solutions business sector.

Taken altogether, the highest overall potential for risk – in terms of the number of risks and the potential overall risk – lies in the Mobility Solutions business sector. However, the potential scale of loss is disproportionately small compared with the sector's share of total sales. There are no particular risks affecting the Industrial Technology or Energy and Building Technology business sectors, although the high level of market volatility is a significant factor. In Consumer Goods, there are risks due to changes in the markets, particularly the market for household appliances, and the need to further adapt our market presence. The risks facing Building Technology are low overall.

Compliance: A clear commitment to taking responsibility, obeying the law, and behaving ethically is immensely important to Bosch. Resources were bolstered as planned as part of the continuous further development of our compliance organization. To enhance the independence of our compliance offices, the regional compliance officers now report to headquarters on meeting their objectives. We also set up three regional management teams. In addition, we repeated our global analysis of corruption risk, and also launched new web-based training courses on antitrust law, export controls, and our product development code for target groups with between 87,000 and 140,000 associates. More than 250,000 people had completed training courses by the end of 2019. A poster campaign featuring individual associates was rolled out across the world to permanently raise awareness of compliance among the entire workforce.

Legal risks: In May 2019, the Stuttgart public prosecutor's office terminated its proceedings against Bosch relating to diesel vehicle emissions. The fine amounted to 90 million euros. Bosch cooperated fully with the Stuttgart public prosecutor's office in investigating the matters in question and decided not to appeal. The monetary fine proceedings against Bosch in its capacity as a supplier of engine control units for diesel engines have thus been concluded, and the decision is final and unappealable. The preliminary investigations by the Stuttgart public prosecutor's office into individual associates are still ongoing, as are investigations by authorities outside Germany into other automakers and, in some cases, into Bosch in its capacity as a supplier of engine control units.

With respect to the incidents concerning various automakers' diesel vehicle emissions, Bosch also remains a defendant in some of the many class and individual civil-law actions around the world. This includes the U.S. and Canada, among other countries. These pending actions, as well as further actions that are threatened, pose risks. In all these proceedings, Bosch is asserting its rights. A total of some 450 million U.S. dollars has so far been paid to settle civil-law disputes. In doing so, Bosch neither acknowledges the allegations brought forward by the plaintiffs, nor does it acknowledge any guilt.

Bosch is also engaged in discussions with customers regarding compensation in respect of potential civil-law risks associated with antitrust proceedings that have come to an end. In addition, investigations are still ongoing into the French subsidiary of BSH Hausgeräte concerning a possible breach of antitrust law.

On the basis of the facts relating to antitrust law and engine control units that were available when the financial statements were prepared and that the board of management has assessed, the board of management believes that sufficient precautions have been taken in the form of provisions for legal risks. For the various legal risks outlined above, provisions throughout the group amount to some 880 million euros. From the 2019 business year, the board of management knows of no further legal risks that could, from a present perspective, materially impair the company's net assets, financial position, or results of operations.

Financial risks: The operating business of the Bosch Group is affected by fluctuations in exchange and interest rates. The aim of business policy is to limit these risks. Our strategy of maintaining a strong global presence with local production and worldwide purchasing activities generally reduces currency risks. A foreign exchange balance plan showing net positions per foreign currency is used as the basis for controlling currency risks. If necessary, these risks, including interest-rate risks, are hedged through centralized hedging transactions. Internal regulations and guidelines set down a mandatory framework and define responsibilities relating to payment transactions, investments, and hedging activities. According to our regulations, financial instruments such as forward transactions and interest swaps may only be used in connection with the operating business, financial investments, or financing transactions; speculative transactions are not allowed. Hedging transactions are entered into solely via banks whose creditworthiness is good. Their creditworthiness is constantly monitored, and counterparty credit limits are defined accordingly.

We have extensive financial assets. These are subject above all to interest-rate and exchange-rate risks. We control these risks by means of an investment process geared to our financial exposure. The objective is to secure appropriate, risk-adjusted returns on invested capital. Here, we endeavor to spread our investments as widely as possible. A limit system is used to closely monitor investment risk. Prescribed risk limits for the specific investment categories limit the potential loss. The impact of changes in interest rates on borrowed funds is sharply limited over the short and medium term by balancing the maturities of financial liabilities. Changes in financial assets and liabilities are monitored on an ongoing basis. We identify liquidity risks as part of our liquidity planning. Thanks to our good credit rating and existing financing arrangements, we have good access to external funding.

Consolidated financial statements

Bosch Group

INCOME STATEMENT

for the period from January 1 to December 31, 2019

Figures in millions of euros

	Note	2019	2018
Sales revenue	1)	**77,721**	**78,465**
Cost of sales		–53,236	–51,696
Gross profit		**24,485**	**26,769**
Distribution and administrative cost	2)	–16,262	–15,308
Research and development cost	3)	–6,079	–5,963
Other operating income	4)	2,306	2,005
Other operating expenses	5)	–1,540	–1,987
Result from entities consolidated using the equity method		–7	–14
EBIT		**2,903**	**5,502**
Financial income	6)	2,301	1,956
Financial expenses	6)	–1,948	–2,391
Profit before tax		**3,256**	**5,067**
Income taxes	7)	–1,196	–1,493
Profit after tax		**2,060**	**3,574**
of which attributable to non-controlling interests	8)	469	527
of which attributable to parent company		1,591	3,047

01

STATEMENT OF COMPREHENSIVE INCOME

for the period from January 1 to December 31, 2019

Figures in millions of euros

	2019	2018
Profit after tax	**2,060**	**3,574**
Change in debt instruments, measured at fair value	187	−151
of which reclassified to profit or loss	−19	2
Currency translation of entities outside the euro zone	162	−83
Items that will be reclassified to profit or loss	**349**	**−234**
Change in equity instruments, measured at fair value	1,077	−305
Remeasurement of pension provisions	−1,003	−1,408
of which write-down of deferred taxes on pension provisions		−1,009
Items that will not be reclassified to profit or loss	**74**	**−1,713**
Other comprehensive income	**423**	**−1,947**
Comprehensive income	**2,483**	**1,627**
of which attributable to non-controlling interests	483	504
of which attributable to parent company	2,000	1,123

02

STATEMENT OF FINANCIAL POSITION
for the year ended December 31, 2019

Assets
Figures in millions of euros

	Note	12/31/2019	12/31/2018
Current assets			
Cash and cash equivalents	10)	4,558	4,716
Trade receivables	11)	14,024	14,859
Other financial assets	12)	3,400	2,276
Contract assets	13)	1,003	905
Income tax receivables		329	529
Other assets	14)	2,087	1,868
Inventories	15)	10,983	11,015
		36,384	**36,168**
Non-current assets			
Financial assets	16)	14,859	12,558
Contract assets	13)	648	560
Income tax receivables		151	164
Property, plant, and equipment	17)	21,894	20,492
Right-of-use assets	29)	2,083	
Intangible assets	18)	10,097	10,879
Investments measured at equity		4	19
Other assets		371	213
Deferred taxes	7)	2,539	2,601
		52,646	**47,486**
Total assets		**89,030**	**83,654**

Equity and liabilities
Figures in millions of euros

	Note	12/31/2019	12/31/2018
Current liabilities			
Trade payables	19)	7,673	7,627
Lease liabilities		503	
Other financial liabilities	20)	1,417	1,591
Contract liabilities	21)	1,385	1,427
Income tax liabilities		252	260
Other liabilities	22)	5,864	6,229
Income tax provisions		108	195
Other provisions	22)	4,974	4,234
		22,176	**21,563**
Non-current liabilities			
Financial liabilities	20)	4,149	4,652
Lease liabilities		1,608	
Contract liabilities	21)	288	197
Other liabilities	22)	172	183
Pension provisions	23)	12,648	11,415
Income tax provisions		449	566
Other provisions	22)	4,769	4,111
Deferred taxes	7)	1,692	1,791
		25,775	**22,915**
Equity	24)		
Issued capital		1,200	1,200
Capital reserve		4,557	4,557
Retained earnings		33,110	31,199
Unappropriated earnings		119	242
Non-controlling interests		2,093	1,978
		41,079	**39,176**
Total equity and liabilities		**89,030**	**83,654**

STATEMENT OF CHANGES IN EQUITY

Figures in millions of euros

			Retained earnings		
	Issued capital	**Capital reserve**	**Earned profit**	**Treasury stock**	**Currency translation**
1/1/2018	**1,200**	**4,557**	**33,321**	**–62**	**–566**
Comprehensive income					–57
Dividends					
Transfer to retained earnings			2,805		
Other changes					
12/31/2018	**1,200**	**4,557**	**36,126**	**–62**	**–623**
Comprehensive income					155
Dividends					
Transfer to retained earnings			1,472		
Other changes					
12/31/2019	**1,200**	**4,557**	**37,598**	**–62**	**–468**

1. Comprising the reserve from pension provisions, the non-reclassifiable gain/losses transferred from the reserve from financial instruments on sale, and other changes in equity

Other comprehensive income						
Financial instruments	Other[1]	Total	Unappropriated earnings	Equity parent company	Equity non-controlling interests	Group equity
1,145	**−3,536**	**−2,957**	**241**	**36,300**	**1,783**	**38,083**
−459	−1,408	−1,924	3,047	1,123	504	1,627
			−241	−241	−288	−529
			−2,805			
−70	86	16		16	−21	−5
616	**−4,858**	**−4,865**	**242**	**37,198**	**1,978**	**39,176**
1,258	−1,004	409	1,591	2,000	483	2,483
			−242	−242	−241	−483
			−1,472			
−532	562	30		30	−127	−97
1,342	**−5,300**	**−4,426**	**119**	**38,986**	**2,093**	**41,079**

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STATEMENT OF CASH FLOWS

Figures in millions of euros

	Note 25)	2019	2018
EBIT		2,903	5,502
Depreciation and amortization[1]		5,261	4,253
Change in pension provisions and non-current provisions		426	−1,495
Gains on disposal of non-current assets		−552	−128
Losses on disposal of non-current assets		150	209
Result from investments measured at equity		7	14
Financial income, cash effective		862	1,187
Financial expenses, cash effective		−1,184	−1,366
Interest and dividends received		496	494
Interest paid		−189	−225
Income taxes paid		−1,209	−1,419
Cash flow		**6,971**	**7,026**
Increase in inventories		−92	−1,055
Change in receivables and other assets		−711	1,131
Decrease in liabilities		−365	−89
Increase in current provisions		756	254
Cash flows from operating activities (A)		**6,559**	**7,267**
Acquisition of subsidiaries and other operating units		−27	
Disposal of subsidiaries and other operating units		−105	48
Additions to non-current assets		−5,862	−5,912
Proceeds from disposal of non-current assets		1,088	255
Purchase of securities		−6,477	−5,400
Disposal of securities		6,270	4,899
Cash flows from investing activities (B)		**−5,113**	**−6,110**
Acquisition of non-controlling interests		−111	
Borrowing		28	30
Repayment of financial liabilities		−608	−520
Repayment of lease liabilities		−497	
Dividends paid		−483	−529
Cash flows from financing activities (C)		**−1,671**	**−1,019**
Change in liquidity (A+B+C)		**−225**	**138**
Liquidity at the beginning of the period (January 1)		**4,716**	**4,543**
Exchange rate-related increase in liquidity		38	15
Increase in liquidity due to changes in the consolidated group		29	20
Liquidity at the end of the period (December 31)		**4,558**	**4,716**

1. Prior year: After offsetting write-ups of EUR 3 million.

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NOTES

Principles and methods

General explanations

The consolidated financial statements of the Bosch Group for the year ended December 31, 2019, have been prepared according to the standards issued by the International Accounting Standards Board (IASB), London. The International Financial Reporting Standards (IFRSs) and the Interpretations of the IFRS Interpretations Committee (IFRS IC) as adopted by the EU at the end of the reporting period have been applied. The previous-year figures have been determined using the same principles.

The consolidated financial statements are in line with the provisions of Sec. 315e HGB [*Handelsgesetzbuch*: German Commercial Code] and Regulation (EC) No 1606/2002 of the European Parliament and of the Council of July 19, 2002, on the application of international accounting standards.

On November 29, 2019, the EU endorsed amendments to IAS 1 *Presentation of Financial Statements* and IAS 8 *Accounting Policies, Change in Accounting Estimates and Errors* as well as amendments to the Conceptual Framework. The amendments will become effective for fiscal years beginning on or after January 1, 2020. They will not be early-applied in the Bosch Group. First-time application of the amended standards is not expected to have any significant effects on the Bosch Group.

To enhance the clarity and transparency of the consolidated financial statements, individual items of the consolidated income statement and the consolidated statement of financial position have been combined. These items are explained separately in the notes to the consolidated financial statements. The income statement has been prepared using the function of expense method.

The group currency is the euro (EUR). Unless otherwise stated, all figures are in millions of euros (EUR million).

The consolidated financial statements prepared as of December 31, 2019, were authorized for disclosure by the board of management on March 11, 2020. The consolidated financial statements and group management report will be filed with the Federal Gazette [*Bundesanzeiger*] and published there.

Basis of consolidation

Besides Robert Bosch GmbH, the consolidated financial statements include all subsidiaries for which Robert Bosch GmbH fulfills the criteria for control pursuant to IFRS 10 *Consolidated Financial Statements*. These entities are included in the consolidated financial statements from the date on which the Bosch Group obtains control. Conversely, subsidiaries are no longer fully consolidated when control of the entity is lost.

The capital of the companies consolidated in the fiscal year for the first time is consolidated pursuant to IFRS 3 *Business Combinations*, using the acquisition method of accounting. At the time of combination, the cost of the shares acquired is offset against pro-rata revalued equity. Assets, liabilities, and contingent liabilities are carried at fair value. Remaining debit differences are accounted for as goodwill. Any credit differences are recognized with effect on income. Any difference resulting from the purchase of additional non-controlling interests is offset against equity.

The accounting for joint arrangements in accordance with IFRS 11 *Joint Arrangements* is based on whether they are classified as a joint operation or a joint venture, which in turn depends on the contractually agreed rights and obligations of the parties to the arrangement. For joint operations, the Bosch Group recognizes, in relation to its interest, its rights to the assets, liabilities, expenses, and revenue in the corresponding items in the consolidated financial statements. Interests in joint ventures as defined by IFRS 11 are accounted for using the equity method.

Pursuant to IAS 28 *Investments in Associates and Joint Ventures*, investments are included in the consolidated financial statements using the equity method if significant influence can be exercised. At present, no associates have been accounted for using the equity method. On the grounds of materiality, investments in associates are measured at amortized cost.

Within the consolidated group, intercompany profits and losses, sales, expenses, and other income, as well as all receivables and liabilities or provisions, are eliminated. In the case of consolidation measures with an effect on income, the effects for income tax purposes are considered and deferred taxes recognized.

Currency translation

In the separate financial statements of the group companies, all receivables and liabilities denominated in currencies other than the euro are measured at the closing rate, regardless of whether they are hedged or not. Exchange-rate gains and losses from revaluations are recorded in profit or loss.

The financial statements of the consolidated companies outside the euro zone are translated into euros in accordance with IAS 21 *The Effects of Changes in Foreign Exchange Rates*. Assets and liabilities are translated at the closing rate, while equity is translated at historical rates. The line items of the income statement are translated into euros at the annual average exchange rates. Any resulting exchange-rate differences are recorded directly in equity until the disposal of the subsidiaries, and disclosed as a separate line item in equity.

For the most important non-euro currencies of the Bosch Group, the following exchange rates apply:

		Closing rate		Average rate	
	1 EUR =	**12/31/2019**	**12/31/2018**	**2019**	**2018**
Australia	AUD	1.60	1.62	1.61	1.58
Brazil	BRL	4.52	4.44	4.41	4.31
China	CNY	7.82	7.88	7.74	7.81
Czech Republic	CZK	25.41	25.72	25.67	25.65
Hungary	HUF	330.52	321.51	325.32	318.87
India	INR	80.19	79.73	78.84	80.74
Japan	JPY	121.94	125.85	122.01	130.41
Korea	KRW	1,296.28	1,277.93	1,305.32	1,299.15
Poland	PLN	4.26	4.30	4.30	4.26
Russian Federation	RUB	69.96	79.72	72.46	74.02
Switzerland	CHF	1.09	1.13	1.11	1.16
Turkey	TRY	6.68	6.06	6.36	5.71
United Kingdom	GBP	0.85	0.89	0.88	0.88
United States	USD	1.12	1.15	1.12	1.18

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Accounting policies

In the 2019 fiscal year, there were changes in accounting policies from the first-time application of IFRS 16 *Leases*. The disclosures required on the effects of first-time application of the new standard are presented in the section “First-time application of amended accounting standards.”

Financial instruments
In accordance with IAS 32 *Financial Instruments: Presentation*, a financial instrument is any contract that gives rise to a financial asset of one entity and to a financial liability or equity instrument of another entity.

Financial assets and financial liabilities are recognized in the statement of financial position when the Bosch Group becomes party to the contractual provisions of the financial instrument. For regular way purchases or sales, however, the settlement date is the relevant date for initial recognition and for derecognition from the statement of financial position. On initial recognition, financial assets and financial liabilities are measured at fair value and classified in accordance with IFRS 9 *Financial Instruments*. Unless subsequent measurement is at fair value through profit or loss, directly attributable transaction costs are taken into account on initial recognition. The fair-value option pursuant to IFRS 9 is not exercised. Hedge accounting is not used in the Bosch Group.

On initial recognition, financial assets are classified either as at amortized cost (AC), at fair value through profit or loss (FVPL), or at fair value through other comprehensive income (FVOCI). The classification depends on the business model underlying the financial assets as well as the contractual cash flow characteristics of the asset. Classification is determined by

- whether the financial asset is held within a business model whose objective is to hold financial assets in order to collect contractual cash flows (“hold” business model), whether the objective is achieved by both collecting contractual cash flows and selling financial assets (“hold and sell” business model), or solely by selling financial assets (“sell” business model), and
- whether the contractual cash flows are “solely payments of principal and interest” (SPPI).

The business model is determined on the basis of the Bosch Group’s corporate management. For this purpose, the financial instruments are grouped together by their underlying business model. The contractual cash flow characteristics are reviewed at the level of the individual financial instrument.

Financial assets whose cash flows are solely payments of principal and interest on the principal amount outstanding and held within the “hold” business model are measured at amortized cost (AC). These are trade receivables, cash and cash equivalents, bank balances, loan receivables, and sundry other financial receivables. These assets are subsequently measured using the effective interest method; impairment gains and losses or gains or losses from the derecognition of assets are recognized in profit or loss.

If the group also intends to collect cash flows from selling financial assets (“hold and sell” business model), the financial assets are measured at fair value through other comprehensive income (with recycling, FVOCI wR). Gains and losses are recorded in other comprehensive income in this case. Cumulative changes in fair value are reclassified to profit or loss when the instruments are sold. Impairment losses are likewise reclassified from other comprehensive income to profit or loss. Interest income is recognized in profit or loss using the effective interest method. Most of the Bosch Group’s interest-bearing securities are measured in this category.

Financial assets that do not satisfy the cash flow criterion because there are not solely payments of principal and interest on the principal amount outstanding are measured at fair value through profit or loss (FVPL). Changes in fair value and income from these assets are recognized immediately in profit or loss. This category mainly comprises interests in partnerships, shares in investment funds, certain interest-bearing securities, and derivatives with a positive market value which are mainly used to limit currency, interest, and commodity risks in accordance with internal risk management.

The group may, at initial recognition, irrevocably designate equity instruments that are not held for trading as measured at fair value through other comprehensive income (no recycling, FVOCI nR) rather than as measured at fair value through profit or loss. In that case, all changes in value are recognized in other comprehensive income. Cumulative changes in value are not reclassified to profit or loss even when the financial asset is sold. Dividend income, however, is recognized in profit or loss. The Bosch Group has decided to apply this option for investments in corporations and for shares reported under securities because this measurement method appropriately presents the net assets and results of operations.

With regard to financial assets (not including equity instruments) that are not measured at fair value through profit or loss, IFRS 9 requires loss allowances to be recognized for any expected credit losses. The extent to which expected losses are recognized is determined based on three levels that differ in terms of whether the credit risk on financial assets has significantly increased since initial recognition. Level 1 includes all financial assets whose credit risk has not increased significantly and whose outstanding payments are up to 30 days past due. In these cases, credit losses are recognized in relation to the probability of a default occurring over the next 12 months. If the borrower’s credit risk has increased significantly, the financial instrument is allocated to level 2, and loss allowances are recognized at an amount equal to the expected losses over the lifetime of the financial instrument. A significant increase in credit risk is assumed when agreed payments are more than 30 days past due or information is available about a deterioration in the borrower’s financial situation. If there is additional evidence that the financial asset is credit-impaired, it is allocated to level 3. Evidence includes payments more than 90 days past due, observable data about significant financial difficulty of the borrower, a high probability that the borrower will enter bankruptcy, and significant changes in the issuer’s technological, economic, regulatory, or market environment.

A simplified loss allowance model applies for trade receivables, contract assets, and lease receivables, according to which a loss allowance is always recognized at the lifetime-expected credit losses, irrespective of any changes in the credit risk since initial recognition of the financial asset. As a practical expedient, a loss allowance table is used in the Bosch Group for receivables that are not credit-impaired, which determines the expected losses over the remaining term as a flat-rate percentage in relation to the number of days past due. Historical probabilities of default are used as a basis, supplemented by forward-looking parameters of relevance for the credit risk. If there is any information available about financial difficulty of the borrower, the assets are analyzed individually and a loss allowance for credit-impaired receivables is recognized. According to internal group guidelines, the carrying amounts of receivables are generally adjusted via a loss allowance account.

Financial liabilities are generally subsequently measured at amortized cost using the effective interest method. In the Bosch Group, this applies to trade payables, bonds, promissory note loans, liabilities to banks, loan liabilities, and other financial liabilities. The main exception to this rule is financial liabilities held for trading, which are measured at fair value through profit or loss. In the Bosch Group, these are derivatives with a negative market value.

When determining the fair value of financial assets and financial liabilities, the input factors of the measurement methods pursuant to IFRS 13 *Fair Value Measurement* are categorized as follows:

- Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities that the accounting entity can access at the measurement date
- Level 2: Inputs other than quoted prices included within level 1 that are observable, either directly or indirectly
- Level 3: Inputs that are not based on observable market data

The fair value of current financial assets and liabilities is assumed to correspond to the carrying amount.

Financial assets are derecognized when the rights to cash flows have expired, e.g. after completion of bankruptcy proceedings or after a court ruling. They are also derecognized when the Bosch Group transfers substantially all risks and rewards from a financial asset. Financial liabilities are derecognized when the obligations specified in the contract have been discharged or canceled or have expired.

Financial assets and financial liabilities are offset and presented as a net amount in the statement of financial position when there is a legal right to offset, and the group either intends to settle on a net basis, or the asset and the liability are settled at the same time.

Inventories include raw materials, consumables, and supplies; work in process, finished goods, and merchandise; and prepayments. Inventories are stated at purchase cost or cost of conversion using the average cost method. In addition to direct cost, cost of conversion includes an allocable portion of necessary materials and production overheads as well as production-related depreciation that can be directly allocated to the production process. Appropriate allowance is made for risks associated with holding and selling inventories due to obsolescence. Inventories are written down further when their net realizable value falls below cost.

In the Mobility Solutions business sector, development cost incurred for research and development work separately commissioned and separately charged is recognized as work in process under inventories until the date when control is transferred (revenue recognition at a point in time), and not as research and development cost through profit or loss. This development work in process is generally measured on the same basis as all other work in process, except that no allowances for slow-moving goods or obsolescence are applied.

Property, plant, and equipment are measured at cost less depreciation and, if necessary, impairment losses. Depreciation is charged on a straight-line basis over the economic useful life.

Depreciation is based on the following ranges of useful lives:

	Useful life
Buildings	10 – 50 years
Plant and equipment	8 – 11 years
Other equipment, fixtures, and furniture	3 – 25 years

07

In accordance with IAS 36 *Impairment of Assets*, impairment losses are recorded on property, plant, and equipment if the recoverable amount has fallen below their carrying amount. Impairment losses are reversed if the reasons for the impairment loss from previous years no longer apply. Repair costs are recognized in the income statement.

Investment property is measured at depreciated cost in accordance with IAS 40 *Investment Property.*

Government grants are recognized pursuant to IAS 20 *Accounting for Government Grants and Disclosure of Government Assistance* only if it is sufficiently certain that the assistance will be granted and the conditions attached to the assistance are satisfied. Grants related to assets are deducted in order to calculate the carrying amount of the asset. Grants related to income are presented as part of profit or loss in the period in which the related expenses are incurred.

Purchased and internally generated intangible assets are capitalized pursuant to IAS 38 *Intangible Assets* if a future economic benefit will flow to the entity from the use of the asset and the cost of the asset can be reliably determined. These assets are generally carried at cost and amortized using the straight-line method over their economic useful life. As a rule, the useful life is four years. Intangible assets accounted for in the course of business combinations have a useful life of up to 50 years.

Goodwill from business combinations represents the difference between the purchase price on the one hand and the proportionate share of equity at acquisition-date fair value on the other. Goodwill is allocated to the divisions (cash-generating units) and tested annually for impairment. If the carrying amount of a cash-generating unit's net assets exceeds their recoverable amount, impairment losses are charged in accordance with the requirements of IAS 36. Pursuant to IFRS 1 *First-time Adoption of International Financial Reporting Standards*, goodwill existing as of January 1, 2004 (date of transition), was transferred at the carrying amount in accordance with the provisions of the German Commercial Code. Goodwill is also tested for impairment pursuant to the provisions of IAS 36.

Intangible assets with an indefinite useful life are tested annually for impairment. Intangible assets subject to wear and tear are only tested for impairment if there is any indication that they may be impaired. Impairment losses are recorded in accordance with IAS 36 if the recoverable amount of the asset concerned has fallen below the carrying amount. Impairment losses are reversed if the reasons for the impairment loss from previous years no longer apply.

As a rule, **borrowing costs** are not included in the cost of assets. If they are directly attributable to the acquisition, construction, or production of a qualifying asset they are included in the cost of that asset in accordance with IAS 23 *Borrowing Costs*. Write-downs on capitalized borrowing costs are reported in the cost of sales.

Interests in jointly controlled entities are included in the consolidated financial statements using the equity method. The carrying amount of these interests is subsequently measured in accordance with the change in equity of the jointly controlled entity attributable to the Bosch Group, less any write-offs, where appropriate.

In accordance with IAS 12 *Income Taxes*, **deferred tax assets and liabilities** are recorded for temporary differences between the tax carrying amounts and the carrying amounts in the consolidated statement of financial position unless they arise from the initial recognition of an asset or liability in a transaction that is not a business combination and, at the time of the transaction, affect neither the profit before tax nor the taxable income. Deferred tax assets are recognized for unused tax losses and unused tax credits to the extent that it is sufficiently probable that they can be utilized. The deferred tax item equals the estimated tax expense or relief in later periods. The tax rate applicable at the time of realization is taken as a basis. Tax implications from profit distributions are generally not considered until the resolution for the appropriation of profits has been adopted. If it is uncertain whether recognized deferred taxes can be realized, they are adjusted accordingly.

Assets and liabilities held for sale are classified as held for sale if their carrying amount will be recovered principally through a sale transaction and the sale is highly likely to be effected. In accordance with IFRS 5 *Non-current Assets Held for Sale and Discontinued Operations*, they are measured at the lower of carrying amount or fair value less costs to sell, unless another standard prescribes a different measurement method.

Pursuant to IAS 19 *Employee Benefits*, **pension provisions** are recognized using the projected unit credit method, taking estimated future increases in pensions and salaries into account, among other things. The expense from unwinding the discount on pension provisions is reported in the financial result under interest expenses.

Tax provisions pertain to obligations relating to income tax and other taxes. Deferred taxes are disclosed in separate line items of the statement of financial position.

Pursuant to IAS 37 *Provisions, Contingent Liabilities, and Contingent Assets*, **other provisions** are recognized if there is a current obligation from a past event which will probably lead to an outflow of resources embodying economic benefits in the future. In addition, it must be possible to reliably estimate the amount of this outflow. Other provisions are measured at full cost. Provisions due in more than one year are stated at their discounted settlement amount. They are discounted at the capital market interest rate that reflects the risks specific to the liability.

Revenue from contracts with customers is recognized in accordance with IFRS 15 *Revenue from Contracts with Customers* when the customer obtains control of the goods or services, and is thus able to direct the use and obtain substantially all the remaining benefits from the goods or services. This is based on the assumption that there is a contract that creates enforceable rights and obligations; in addition, it must be probable that the Bosch Group will collect the consideration for the goods and services transferred. Revenue is recognized at the amount of the transaction price, i.e. the amount of the consideration that the Bosch Group is expected to collect in exchange for the transfer of goods and services arranged. IFRS 15 sets forth a consistent, five-step model for determining the amount of revenue to be reported, which is generally applicable for all customer contracts.

In the sale of goods, control is typically transferred to the customer on delivery. Invoicing usually takes place at the same time. Revenue from services is mostly recognized once the service has been rendered in its entirety and invoiced. Revenue from royalties is typically recognized over the corresponding term of the contract. For customer-specific products that are allocable to the Mobility Solutions business sector and do not create an asset with an alternative use for the group, revenue is recognized over time; the same applies to plant engineering contracts in the Industrial Technology and Energy and Building Technology business sectors. Revenue is recognized according to the percentage of completion, which can be determined using input or output methods. Output methods recognize revenue on the basis of the value to the customer of the goods or services transferred relative to the remaining goods or services promised under the contract. Input methods recognize revenue on the basis of costs incurred relative to the estimated total costs. Depending on the underlying business model, the Bosch Group uses input methods as well as output methods in determining the percentage of completion.

IFRS 15 requires an entity to present a contract as an asset or a liability based on the relationship between its performance and the customer's payment. Contract assets recognized in the statement of financial position represent the Bosch Group's right to receive consideration for goods or services already transferred to customers. In contrast, contract liabilities are presented when the Bosch Group has already received consideration from customers for goods or services still to be transferred.

A contract asset is also recognized for incremental costs of obtaining a contract if the Bosch Group expects to be able to recover such costs. The contract asset is amortized over the term of the contract on a straight-line basis as a reduction of revenue.

Cost of sales contains the cost of internally manufactured goods sold and the cost price of resold merchandise. The cost of internally manufactured goods sold contains materials and production cost that can be allocated directly, the allocable parts of indirect production overheads, including the depreciation of production equipment and the amortization of other intangible assets, and the write-downs of inventories. Cost of sales also includes development work charged directly to customers and amortization of capitalized development work.

Development cost that cannot be capitalized is released to profit or loss in the period incurred.

Assumptions and estimates
The preparation of consolidated financial statements in accordance with IFRSs requires that assumptions and estimates be made for some line items. These assumptions and estimates have an effect on the amount and disclosure of the assets and liabilities, income and expenses, and contingent liabilities disclosed in the reporting period. Estimates and assumptions concern the following:

The determination of loss allowances on receivables and contract assets is based on estimates and assumptions with respect to the credit standing of individual customers. The measurement of inventories requires assumptions and estimates to be made, including for determining the net realizable value. The discounted future cash flows used as a basis for testing goodwill, other intangible assets, and property, plant, and equipment for impairment are based on estimates. Assumptions are also made in the determination of the discount rates and growth rates used. The determination of lease terms requires that assumptions and estimates be made with respect to the likelihood of termination and extension options being exercised. The recognition of deferred tax assets is premised on their future recoverability being probable. Consequently, assumptions have to be made regarding future taxable income and the expected timing of the reversal of temporary differences. Further assumptions are required to determine the useful lives of items subject to wear and tear within property, plant, and equipment and intangible assets. The determination of carrying amounts of investments also involves making assumptions and estimates. Pension provisions and similar obligations are measured using actuarial methods. This requires various assumptions, including with respect to life expectancy, salary trends, and the pension growth rate. The recognition and measurement of other provisions is based on estimates of the amount and probability of future events. To the extent possible, such estimates are based on past experience, and are regularly reviewed and adjusted as necessary.

First-time application of amended accounting standards
The first-time application of IFRS 16 *Leases* had significant effects on the consolidated financial statements of the Bosch Group as of December 31, 2019. The standard is applied from January 1, 2019 onward; the previous-year figures are not restated.

On the date of initial application, the outstanding lease payments under contracts previously classified as operating leases were recognized at present value as lease liabilities. The average interest rate applied in this respect was 2.7 percent. Right-of-use assets were generally recognized on the date of initial application at the amount of the lease liability, adjusted for any advance payments made or deferred lease payments.

Of the choices available on the date of initial application, the following were made:

- Subsequent changes in the assessment of whether extension or termination options will be exercised were considered in determining the lease term.
- Right-of-use assets were not tested for impairment, but offset instead against provisions as of December 31, 2018.
- Initial direct costs were not included in the measurement of right-of-use assets.
- No right-of-use assets or lease liabilities were recognized for leases for which the lease term ended within one year of the date of initial application of IFRS 16.

The lease liabilities of EUR 2,115 million recognized as of January 1, 2019, compare with obligations from operating leases of EUR 2,025 million reported in the consolidated financial statements as of December 31, 2018. The difference is primarily attributable to non-lease components taken into account in the measurement of lease liabilities under IFRS 16 as well as to effects from changes in estimates relating to the expected lease term. However, these factors were partly offset by the discount effect and above all by payments for short-term leases and leases of low-value assets, for which no lease liabilities were recognized.

Initial application of IFRS 16 had the following effects on the consolidated statement of financial position:

Figures in millions of euros

	12/31/2018	IFRS 16	1/1/2019
Assets			
Property, plant, and equipment	20,492	–26	20,466
Right-of-use assets		2,098	2,098
Other assets	2,081	–7	2,074
Equity and liabilities			
Financial liabilities	6,243	–25	6,218
Lease liabilities		2,115	2,115
Other liabilities	6,412	–10	6,402
Other provisions	8,345	–15	8,330

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The table includes only items of the statement of financial position affected by initial application of IFRS 16. As a practical expedient, current and non-current items have been combined.

Consolidation

Consolidated group

Robert Bosch GmbH is headquartered in Stuttgart, Germany. The shareholders of Robert Bosch GmbH are Robert Bosch Stiftung GmbH, Stuttgart (92.0 percent of the shares), the Bosch family (7.4 percent of the shares), and Robert Bosch Industrietreuhand KG, Stuttgart, which performs the entrepreneurial ownership functions. Robert Bosch GmbH holds treasury stock equivalent to 0.6 percent of capital.

Besides Robert Bosch GmbH, the consolidated group comprises a further 438 (previous year: 462) fully consolidated entities. The group developed as follows:

	Germany	Outside Germany	Total
Included in consolidation at January 1, 2018	**94**	**349**	**443**
Additions/formations in fiscal year 2018	5	22	27
Disposals/mergers in fiscal year 2018	3	4	7
Included in consolidation at December 31, 2018	**96**	**367**	**463**
Additions/formations in fiscal year 2019	8	10	18
Disposals/mergers in fiscal year 2019	16	26	42
Included in consolidation at December 31, 2019	**88**	**351**	**439**

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The consolidated group includes four special funds, as well as other investments.

In the fiscal year 2019, the following companies were consolidated for the first time:

- Bosch Hilfe GmbH, Stuttgart, Germany,
- Bosch Wohnungsverwaltungsgesellschaft mbH & Co. KG, Stuttgart, Germany,
- EM-motive GmbH, Hildesheim, Germany,
- GFR–Gesellschaft für Regelungstechnik und Energieeinsparung mbH, Verl, Germany,
- GFR Gesellschaft für Regelungstechnik und Energieeinsparung mbH, Jena, Germany,
- Residential IoT Services GmbH, Munich, Germany,
- Robert Bosch Wohnungsgesellschaft mbH, Stuttgart, Germany,
- WOGE Service- und Regiebetrieb GmbH, Stuttgart, Germany,
- BSH Home Appliances Holding LLC, New Cairo, Egypt,
- BSH Home Appliances LLC, New Cairo, Egypt,
- Bosch Telecom Ltda., Campinas, Brazil,
- Bosch Soluções Integradas Brasil Ltda., Campinas, Brazil,
- Bosch (Donghai) Automotive Test & Technology Center Co., Ltd., Donghai, China,
- Bosch (Hulunbeier) Automotive Test and Technology Center Co., Ltd., Yakeshi, China,
- Bosch Engineering K.K., Tokyo, Japan,
- SPLT México, S.A. de C.V., Mexico City, Mexico,
- Bosch Heating Systems LLC, Engels, Russian Federation,
- Splitting Fares Inc., Detroit, MI, United States.

Due to changes to the consolidated group, sales revenue increased by EUR 26 million, while total assets decreased by EUR 1,491 million.

Condensed financial information on fully consolidated subsidiaries with material non-controlling interests

Figures in millions of euros

	Bosch Automotive Diesel Systems Co., Ltd., Wuxi, China		**United Automotive Electronic Systems Co., Ltd., Shanghai, China**	
	2019	**2018**	**2019**	**2018**
Current assets	1,408	1,284	1,580	1,444
Non-current assets	400	358	1,439	1,423
Current liabilities	568	496	1,074	931
Non-current liabilities	46	45	189	179
Sales revenue	1,897	2,050	2,834	2,965
Profit after tax	413	463	336	452
Comprehensive income	420	453	347	436
Cash flows from operating activities	390	285	505	660
Cash flows from investing activities	–62	–59	–339	–277
Cash flows from financing activities	–327	–229	–148	–313
Share of capital attributable to non-controlling interests	34.0 %	34.0 %	49.0 %	49.0 %
Profit/loss attributable to non-controlling interests	140	157	165	221
Equity attributable to non-controlling interests	406	374	860	861
Dividends paid to non-controlling interests	111	78	68	153

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Figures in millions of euros

	Bosch HUAYU Steering Systems Group, Shanghai, China		Bosch Ltd., Bengaluru, India	
	2019	**2018**	**2019**	**2018**
Current assets	1,336	1,132	860	1,136
Non-current assets	569	538	946	890
Current liabilities	1,204	1,015	454	537
Non-current liabilities	11	35	51	28
Sales revenue	1,707	1,824	1,281	1,542
Profit after tax	243	181	130	196
Comprehensive income	247	175	143	–8
Cash flows from operating activities	244	84	–17	225
Cash flows from investing activities	–92	–78	304	–166
Cash flows from financing activities	–87	–65	–317	–46
Share of capital attributable to non-controlling interests	49.0%	49.0%	29.5%	29.5%
Profit/loss attributable to non-controlling interests	119	89	38	58
Equity attributable to non-controlling interests	338	304	384	431
Dividends paid to non-controlling interests	42	32	14	13

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The condensed financial information of the respective entities corresponds to the figures before consolidation entries.

Joint ventures and joint operations

The following joint venture is subject to joint control as defined by IFRS 11 and was recognized in the consolidated financial statements as of December 31, 2019, using the equity method in accordance with IAS 28:

- KB Wiper Systems Co., Ltd., Daegu, Korea (50 percent).

The share of capital indicated corresponds to the share of voting rights.

As of March 29, 2019, the Bosch Group acquired Daimler AG’s 50 percent interest in EM-motive GmbH, Hildesheim, Germany. The entity, which had previously been reported as a joint venture, was thus consolidated in full for the first time in the fiscal year 2019.

As in the previous year, there were no unrecognized commitments to joint ventures as of the reporting date that could lead to a future outflow of cash or other resources.

Condensed financial information on individually immaterial joint ventures

Figures in millions of euros

	2019	2018
Carrying amount of the investments	4	19
Group share of profit after tax	–7	–14
Group share of other comprehensive income of the period	5	
Group share of comprehensive income	–2	–14

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The carrying amount of the interests in the above-mentioned individually immaterial joint ventures corresponds to the proportionate share in this entity's equity.

In 2017, Robert Bosch GmbH and Daimler AG set up a development alliance in the field of fully automated driving and driverless vehicles. The headquarters of the joint operation are located in the greater Stuttgart/Ulm area, and the joint work is done in Germany and the United States. Both operators hold a 50 percent interest in the sales revenue from the joint development work and equally share the related expenses incurred.

Discontinued operations

Back in June 2018, plans were announced to sell the Industrial Technology business sector's packaging technology business in order to secure the division's long-term prospects. This decision affected the pharmaceuticals and food units of the Packaging Technology division. In July 2019, the agreement to sell Syntegon Technology GmbH (formerly: Robert Bosch Packaging Technology GmbH), Waiblingen, Germany, including its subsidiaries, was signed. The transaction was closed on December 31, 2019. The sale comprised assets of EUR 1,556 million (thereof current assets of EUR 1,064 million and non-current assets of EUR 492 million) and liabilities of EUR 982 million (thereof current liabilities of EUR 764 million and non-current liabilities of EUR 218 million). The transaction led to a gain of EUR 376 million, with EUR 27 million being reclassified from the currency translation item under retained earnings. Of the provisional purchase price of EUR 923 million, EUR 875 million was paid in the fiscal year 2020 by transferring cash. Of this amount, EUR 174 million relates to existing receivables of Robert Bosch GmbH against Syntegon Technology GmbH, which have been sold to the acquiring company. The purchase price receivable accounted for as of December 31 is mostly reported under current other financial assets, and the gain is included in sundry other operating income. In the cash-flow statement, the effect from the transaction is contained in the line item "Gains on disposal of non-current assets."

Notes to the income statement

01 Sales revenue

Sales revenue amounted to EUR 77,721 million (previous year: EUR 78,465 million). The Mobility Solutions business sector accounted for EUR 46,784 million (previous year: EUR 47,567 million) of this total, the Industrial Technology business sector for EUR 7,494 million (previous year: EUR 7,443 million), the Consumer Goods business sector for EUR 17,752 million (previous year: EUR 17,812 million), and the Energy and Building Technology business sector for EUR 5,654 million (previous year: EUR 5,569 million). Sales revenue that cannot be allocated to the business sectors came to EUR 37 million (previous year: EUR 74 million).

Sales revenue comprises an amount of EUR 1,275 million (previous year: EUR 911 million) that had been included in the balance of current contract liabilities at the beginning of the fiscal year.

In relation to performance obligations not satisfied in full or in part as of the reporting date, an amount of EUR 35 million (previous year: EUR 54 million) is expected to be realized as sales revenue within the next two years and an amount of EUR 10 million (previous year: EUR 18 million) thereafter. These amounts relate to long-term construction contracts.

Sales revenue recognized over time amounts to EUR 41,193 million (previous year: EUR 42,531 million) in the Mobility Solutions business sector, EUR 79 million (previous year: EUR 180 million) in the Industrial Technology business sector, and EUR 224 million (previous year: EUR 8 million) in the Energy and Building Technology business sector.

The section on segment reporting provides a breakdown of sales revenue by region.

02 Distribution and administrative cost

Figures in millions of euros

	2019	**2018**
Administrative expenses	4,358	4,290
Distribution cost	11,904	11,018
	16,262	**15,308**

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The distribution cost includes personnel and non-personnel costs, depreciation charged in the distribution function, customer service, logistics, market research, sales promotion, shipping, advertising, and warranty costs.

03 Research and development cost

Research and development cost contains both research cost and development cost that cannot be capitalized.

Figures in millions of euros

	2019	2018
Total research and development cost	6,229	6,189
Development cost capitalized in the reporting period	–233	–300
Impairment losses on capitalized development cost	83	74
	6,079	**5,963**

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04 Other operating income

Figures in millions of euros

	2019	2018
Income from exchange-rate fluctuations	785	915
Income from the disposal of non-current assets	175	95
Income from rent and leases	12	11
Income from the reversal of provisions	229	217
Sundry other operating income	1,105	767
	2,306	**2,005**

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The income from exchange-rate fluctuations is offset by expenses that are disclosed in other operating expenses. These income and expense items contain the effective exchange-rate results and the results from foreign-currency derivatives allocable to the operating business.

Leases are accounted for according to the rules pertaining to operating leases, provided that substantially all the risks and rewards incidental to ownership remain with the Bosch Group as lessor. The assets concerned are recognized in property, plant, and equipment, and the lease payments received, provided they are not disclosed as sales revenue, are recorded in other operating income.

Government grants related to income amounted to EUR 144 million (previous year: EUR 209 million). They are offset against the respective expenses. If there are no such expenses, the grants are disclosed in sundry other operating income.

05 Other operating expenses

Figures in millions of euros

	2019	2018
Expenses from exchange-rate fluctuations	791	1,037
Loss allowances on receivables and other assets	65	34
Expenses from the disposal of non-current assets	150	212
Other taxes	47	41
Expenses from the recognition of provisions	199	213
Impairment of goodwill		17
Sundry other operating expenses	288	433
	1,540	**1,987**

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06 Financial result

Figures in millions of euros

	2019	2018
Interest and similar income	578	429
Interest and similar expenses	−494	−454
Interest result	**84**	**−25**
Investment income	62	62
Income from securities	505	106
Expenses from securities	−51	−202
Income from exchange-rate fluctuations	661	700
Expenses from exchange-rate fluctuations	−604	−939
Income from derivatives	490	654
Expenses from derivatives	−754	−768
Other income	5	5
Other expenses	−45	−28
Other financial result	**269**	**−410**
Financial result, total	**353**	**−435**
of which financial income	2,301	1,956
of which financial expenses	−1,948	−2,391

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The line item “interest and similar income” contains dividend income of EUR 82 million (previous year: EUR 91 million) and income from investment funds of EUR 23 million (previous year: EUR 22 million).

Capitalized borrowing costs of EUR 8 million (previous year: EUR 11 million) were deducted from interest expenses. The underlying borrowing rate is 2.0 percent (previous year: 2.0 percent).

Investment income comprises income from equity investments as well as changes in the fair value of investments measured at fair value through profit or loss.

Income and expenses from securities include the changes in the fair value of securities measured at fair value through profit or loss, gains and losses on the disposal of securities measured at fair value through other comprehensive income, as well as impairment losses and income from the reversal of impairment losses on such securities.

The line items “income from derivatives” and “expenses from derivatives” contain transactions to hedge financial assets.

Interest income and expenses are attributable to financial instruments not measured at fair value through profit or loss as follows:

Figures in millions of euros

	2019		2018	
	Interest income	**Interest expenses**	**Interest income**	**Interest expenses**
Financial assets, measured at amortised cost (AC)	135		117	
Financial assets, measured at fair value through other comprehensive income, with recycling (FVOCI wR)	180		180	
Financial liabilities, measured at amortised cost (AC)		133		174
	315	**133**	**297**	**174**

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07 Income taxes

Income taxes are classified according to their origin as follows:

Figures in millions of euros

	2019	2018
Current taxes	1,220	1,323
Deferred taxes	–24	170
	1,196	**1,493**

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Deferred taxes are calculated on the basis of the tax rates that apply or are expected to apply given the current legislation in the individual countries at the expected time of realization. The corporate income tax rate for German companies is 15 percent. Taking into account the solidarity surcharge of 5.5 percent and the trade tax levied on profits recorded in Germany, the total tax rate is 29 percent. The tax rates outside Germany range between 9 percent and 34 percent (previous year: between 9 percent and 35 percent).

As of December 31, the deferred tax assets and liabilities presented in the statement of financial position are attributable to the following items:

Figures in millions of euros

	2019		2018	
	Assets	**Liabilities**	**Assets**	**Liabilities**
Receivables, other assets, and inventories	593	521	697	471
Securities, investments	5	314	11	176
Property, plant, and equipment	191	786	294	919
Right-of-use assets		458		
Intangible assets	305	1,127	273	1,265
Other assets	84		118	
Liabilities	1,083	90	1,026	76
Lease liabilities	462			
Provisions	1,236	45	1,109	84
Other liabilities	15	106	1	84
Unused tax losses and tax credits	320		356	
Total	**4,294**	**3,447**	**3,885**	**3,075**
Netting	–1,755	–1,755	–1,284	–1,284
	2,539	**1,692**	**2,601**	**1,791**

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In the fiscal year, write-downs on deferred tax assets came to EUR 2,031 million (previous year: EUR 1,960 million).

There are unused tax losses of EUR 4,825 million (previous year: EUR 2,515 million) for which no deferred tax assets have been recognized. Within the next three years, EUR 98 million of that amount will be forfeited (previous year: EUR 130 million). As in the previous year, there were no tax credits as of the reporting date on which no deferred tax assets had been recognized.

No deferred tax liabilities were recognized on temporary differences in connection with investments in subsidiaries, as it is not probable that these temporary differences will reverse in the foreseeable future. As of the reporting date, retained profits of subsidiaries amount to EUR 18,821 million (previous year: EUR 21,646 million). If these profits are distributed, this could lead to an income tax or withholding tax burden at Robert Bosch GmbH or at the level of intermediate holding entities. The taxable temporary differences were not determined on account of the undue cost or effort involved.

In the reporting period, deferred taxes of EUR 33 million (previous year: EUR 788 million) were recorded directly in equity. Of this total, EUR 109 million decreases (previous year: increase of EUR 55 million) the gains/losses on financial instruments and EUR 76 million increases (previous year: decrease of EUR 843 million) retained earnings due to the change in actuarial parameters in accordance with IAS 19.

In the fiscal year, changed tax rates in the Bosch Group resulted in a deferred tax expense of EUR 12 million (previous year: deferred tax income of EUR 25 million).

The basis for the expected income tax expense is the German tax rate of 29 percent, as in the previous year. The difference between expected and disclosed income tax expense is attributable to the following factors:

Figures in millions of euros

	2019	2018
Profit before tax	3,256	5,067
Expected income tax expense	944	1,469
Variances due to tax rate	−160	−151
Non-deductible expenses	115	180
Zero-rated income	−304	−226
Other differences	601	221
Income tax expense disclosed	**1,196**	**1,493**
Effective tax rate	37%	29%

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08 Non-controlling interests

Profits attributable to non-controlling interests amount to EUR 473 million (previous year: EUR 534 million). They are counterbalanced by losses of EUR 4 million (previous year: EUR 7 million).

09 Other notes to the income statement

In the fiscal year, personnel expenses of EUR 23,824 million (previous year: EUR 22,219 million) were incurred. Cost of materials amounted to EUR 35,303 million (previous year: EUR 35,965 million).

Information about amortization and depreciation is contained in the notes on non-current assets.

Notes to the statement of financial position

10 Cash and cash equivalents

Figures in millions of euros

	2019	2018
Bank balances (term up to 90 days)	4,545	4,702
Cash and reserve bank deposits	13	14
	4,558	**4,716**

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The bank balances are partly invested as secured deposits in tri-party repo transactions. As of the reporting date, the carrying amount of the secured deposits is EUR 400 million (previous year: EUR 600 million). The bank provided collateral of the same amount in the form of securities.

11 Trade receivables

In the fiscal year, trade receivables came to EUR 14,024 million (previous year: EUR 14,859 million). Of that amount, EUR 1 million (previous year: EUR 3 million) has a term of more than one year.

Information about loss allowances on trade receivables is contained in the credit risk section of the note on “Capital and risk management.”

12 Other financial assets (current)

Figures in millions of euros

	2019	2018
Securities	981	1,336
Bank balances (term of more than 90 days)	858	136
Loan receivables	268	192
Derivatives	86	123
Receivables from finance leases	36	35
Sundry other financial assets	1,171	454
	3,400	**2,276**

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The securities classified as current are listed securities with a residual term of less than one year as well as securities which are intended for sale within a year.

The note on “Leases” contains additional disclosures on receivables from finance leases.

13 Contract assets

Figures in millions of euros

	2019		2018	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
From revenue recognition over time	630	3	708	1
From incremental costs of obtaining the contract	71	302	47	245
From development work	302	343	150	314
	1,003	**648**	**905**	**560**

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The contract assets from revenue recognition over time present the excess of the Bosch Group's performance, presented as sales revenue, over consideration already received from the customer. The contract assets from incremental costs of obtaining a contract include those costs that the Bosch Group expects to be able to recover. At the point in time when control is transferred to the customer, contract assets from development work are presented for all separate consideration to be subsequently reimbursed by the customer for separately commissioned research and development work.

14 Other assets (current)

Figures in millions of euros

	2019	2018
Prepaid expenses	229	237
Receivables from tax authorities (without income tax receivables)	1,477	1,376
Sundry other assets	381	255
	2,087	**1,868**

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15 Inventories

Figures in millions of euros

	2019	2018
Raw materials, consumables, and supplies	3,729	3,731
Work in process	2,472	2,277
Finished goods and merchandise	4,735	4,925
Prepayments	47	82
	10,983	**11,015**

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Of the total amount of inventories, an amount of EUR 736 million (previous year: EUR 504 million) is carried at net realizable value. In the fiscal year, impairment losses of EUR 192 million (previous year: EUR 174 million) were recognized in profit or loss. No inventories were pledged as collateral.

16 Non-current financial assets

Figures in millions of euros

	2019	2018
Securities	12,266	10,294
Investments	1,884	1,865
Bank balances	304	3
Loan receivables	32	36
Derivatives	23	5
Receivables from finance leases	159	153
Other financial assets	191	202
	14,859	**12,558**

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Disclosures on loss allowances on loan receivables, other financial receivables, and finance lease receivables are contained in the credit risk section of the note on “Capital and risk management.”

The note on “Leases” contains further details on receivables from finance leases.

Non-current securities
The securities consist of interest-bearing and other securities, investment funds, as well as shares. In the fiscal year, shares with a fair value of EUR 765 million (previous year: EUR 1,105 million) were sold and the cumulative gains on sale of EUR 26 million (previous year: EUR 66 million) were reclassified within retained earnings from the reserve from financial instruments to the item “Other” in “Other comprehensive income.”

The pledged securities have a carrying amount of EUR 1,351 million (previous year: EUR 1,133 million). The pledged securities satisfy the legal requirement to secure obligations to employees and bank guarantees. Fund units equivalent to at least the value of the claims were pledged as collateral.

17 Property, plant, and equipment

Figures in millions of euros

	Land, buildings belonging to operating assets	Investment property	Plant and equipment	Other equipment, fixtures and furniture, leased assets	Prepayments and assets under construction	Total
Gross values 1/1/2018	**10,465**	**92**	**24,955**	**10,958**	**2,554**	**49,024**
Changes in consolidated group	–1		9	–9	2	1
Additions	342		1,082	932	2,590	4,946
Reclassifications	445		1,262	416	–2,123	
Disposals	–163		–888	–574	–38	–1,663
Exchange-rate differences	–14		–246	–31	–15	–306
Gross values 12/31/2018	**11,074**	**92**	**26,174**	**11,692**	**2,970**	**52,002**
Depreciation 1/1/2018	**4,531**	**37**	**17,225**	**8,099**	**3**	**29,895**
Changes in consolidated group	–2		3	–6		–5
Additions	290	1	1,683	1,129		3,103
Reclassifications	11		–3	–17	9	
Disposals	–95		–765	–503		–1,363
Write-ups	–3					–3
Exchange-rate differences	21		–125	–13		–117
Depreciation 12/31/2018	**4,753**	**38**	**18,018**	**8,689**	**12**	**31,510**
Carrying amounts 12/31/2018	**6,321**	**54**	**8,156**	**3,003**	**2,958**	**20,492**
Gross values 12/31/2018	**11,074**	**92**	**26,174**	**11,692**	**2,970**	**52,002**
Transitional effects from IFRS 16	–17		–3	–34		–54
Gross values 1/1/2019	**11,057**	**92**	**26,171**	**11,658**	**2,970**	**51,948**
Changes in consolidated group	116		25	–37	–1	103
Additions	359		1,129	893	2,608	4,989
Reclassifications	252	1	1,382	584	–2,219	
Disposals	–112	–59	–1,150	–732	–60	–2,113
Exchange-rate differences	80		45	39	9	173
Gross values 12/31/2019	**11,752**	**34**	**27,602**	**12,405**	**3,307**	**55,100**
Depreciation 12/31/2018	**4,753**	**38**	**18,018**	**8,689**	**12**	**31,510**
Transitional effects from IFRS 16	–5		–2	–21		–28
Depreciation 1/1/2019	**4,748**	**38**	**18,016**	**8,668**	**12**	**31,482**
Changes in consolidated group	–110		–2	–41		–153
Additions	345	1	1,865	1,203	7	3,421
Reclassifications			–92	74	18	
Disposals	–44	–30	–904	–663	–6	–1,647
Exchange-rate differences	33		39	31		103
Depreciation 12/31/2019	**4,972**	**9**	**18,922**	**9,272**	**31**	**33,206**
Carrying amounts 12/31/2019	**6,780**	**25**	**8,680**	**3,133**	**3,276**	**21,894**

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The total depreciation charge for the fiscal year contains the following impairment losses:

- Land and buildings: EUR 16 million (previous year: EUR 0 million)
- Plant and equipment: EUR 76 million (previous year: EUR 21 million)
- Other equipment, fixtures, and furniture, assets under construction: EUR 14 million (previous year: EUR 4 million)

The impairment losses of the fiscal year contain an amount of EUR 67 million attributable to plant and equipment of the Automotive Electronics division (Mobility Solutions business sector). The impairment losses were recognized because the market did not develop as expected, and also as a result of a decline in unit sales and increased pressure of competition.

EUR 15 million concerns plant and equipment, other equipment, fixtures, and furniture, and assets under construction of the Automotive Steering division (Mobility Solutions business sector). The impairment losses were recognized against the backdrop of increasingly demanding customer specifications and tough competition. EUR 14 million is attributable to land and buildings of BSH Hausgeräte (Consumer Goods business sector).

The previous-year carrying amounts contain the following amounts from finance leases in which the Bosch Group is the lessee:

- Land and buildings: EUR 12 million
- Plant and equipment: EUR 1 million
- Other equipment, fixtures, and furniture: EUR 13 million

The obligations entered into to purchase items of property, plant, and equipment amounted to EUR 542 million (previous year: EUR 895 million); there were no restrictions on title in the fiscal year nor in the previous year. Government grants for assets of EUR 164 million (previous year: EUR 21 million) were deducted from the additions in the reporting year.

Investment property comprises rented land and buildings which were measured at amortized cost. Measured at fair value, the portfolio comes to EUR 30 million (previous year: EUR 112 million). The fair values were calculated at corporate headquarters. The residential property in Germany and Asia allocated to level 3 of the fair-value hierarchy pursuant to IFRS 13 is measured using the discounted earnings or comparative method based on the ImmoWertV [*Verordnung über die Grundsätze für die Ermittlung der Verkehrswerte von Grundstücken*: Ordinance on principles to assess the market value of land], taking the current fabric and market values of the individual properties into account. The rental income from investment property came to EUR 8 million (previous year: EUR 8 million), maintenance expenses totaled EUR 3 million (previous year: EUR 4 million).

18 Intangible assets

Figures in millions of euros

	Acquired intangible assets (without goodwill)	Acquired goodwill	Internally generated intangible assets	Total
Gross values 1/1/2018	**9,116**	**5,650**	**1,973**	**16,739**
Changes in consolidated group	–43	23		–20
Additions	235	2	351	588
Reclassifications	–3	3		
Disposals	–184	–37	–406	–627
Exchange-rate differences	39	25	1	65
Gross values 12/31/2018	**9,160**	**5,666**	**1,919**	**16,745**
Amortization 1/1/2018	**3,643**	**708**	**1,000**	**5,351**
Changes in consolidated group	–37			–37
Additions	726	17	367	1,110
Disposals	–167		–407	–574
Exchange-rate differences	16	–1	1	16
Amortization 12/31/2018	**4,181**	**724**	**961**	**5,866**
Carrying amounts 12/31/2018	**4,979**	**4,942**	**958**	**10,879**
Gross values 1/1/2019	**9,160**	**5,666**	**1,919**	**16,745**
Changes in consolidated group	–91	–111	–37	–239
Additions	372		281	653
Disposals	–145	–14	–272	–431
Exchange-rate differences	39	17	1	57
Gross values 12/31/2019	**9,335**	**5,558**	**1,892**	**16,785**
Amortization 1/1/2019	**4,181**	**724**	**961**	**5,866**
Changes in consolidated group	–61	–8	–13	–82
Additions	775		518	1,293
Disposals	–122	–13	–272	–407
Exchange-rate differences	17		1	18
Amortization 12/31/2019	**4,790**	**703**	**1,195**	**6,688**
Carrying amounts 12/31/2019	**4,545**	**4,855**	**697**	**10,097**

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The total amortization charge for the fiscal year contains the following impairment losses:

- Acquired intangible assets (without goodwill): EUR 2 million (previous year: EUR 0 million)
- Internally generated intangible assets: EUR 83 million (previous year: EUR 74 million)

The impairment losses recognized on internally generated intangible assets relate to capitalized development projects and are attributable to the Mobility Solutions business sector as well as to “Other segments.” They were charged because an economic benefit was no longer expected.

The goodwill of EUR 4,855 million (previous year: EUR 4,942 million) is attributable to the divisions (cash-generating units) as follows:

Figures in millions of euros

	2019	**2018**
Powertrain Solutions	359	347
Automotive Aftermarket	380	376
Automotive Steering	108	108
Drive and Control Technology	1,525	1,529
Packaging Technology		127
Power Tools	387	381
BSH Hausgeräte GmbH	548	548
Building Technologies	472	455
Thermotechnology	1,001	1,001
Other	75	70
	4,855	**4,942**

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Goodwill is tested for impairment annually. An impairment loss is recorded when the recoverable amount is below the carrying amount of the divisions (cash-generating units). An asset’s recoverable amount is the higher of its fair value less costs of disposal and its value in use. Value in use is derived from the future cash flows. The cash flows are determined by reference to business plans with a planning period of five years and based on the medium-term planning approved by management. Planning is based on expectations with respect to future market shares, growth in the respective markets, and the profitability of products and services. Cash flows after the detailed planning period are determined by reference to an expected long-term growth rate.

The parameters used in impairment testing are presented in the following table:

Percentage figures

	Mobility Solutions		Industrial Technology		Consumer Goods		Energy and Building Technology	
	2019	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**
Growth rate	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Pre-tax discount rate	9.1	10.5	9.7	10.2	7.5	8.7	8.8	10.3

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A risk-free interest rate of 0.1 percent (previous year: 1.1 percent) and a market-risk premium of 6.5 percent (previous year: 6.5 percent) are assumed. The standard tax rate used is 29 percent (previous year: 29 percent).

Annual impairment testing of goodwill did not give rise to any impairment losses in the fiscal year. For all items of goodwill, neither an increase in the pre-tax discount rate by 0.5 of a percentage point nor a decrease in the growth rate by 0.5 of a percentage point would have led to an impairment of goodwill.

19 Trade payables

Figures in millions of euros

	2019	**2018**
Trade payables	7,671	7,605
Notes payable	2	22
	7,673	**7,627**

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In the fiscal year, there were no trade payables due in more than one year (previous year: EUR 4 million).

20 Other current and non-current financial liabilities

Figures in millions of euros

	2019		2018	
	up to 1 year	**more than 1 year**	**up to 1 year**	**more than 1 year**
Bonds	499	2,505	300	3,001
Promissory loans		1,498	154	1,498
Liabilities to banks	143	3	269	14
Loans	73	31	71	30
Derivatives	58	8	76	5
Finance lease obligations			7	18
Sundry other financial liabilities	644	104	714	86
	1,417	**4,149**	**1,591**	**4,652**

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21 Contract liabilities

Figures in millions of euros

	2019		2018	
	up to 1 year	**more than 1 year**	**up to 1 year**	**more than 1 year**
From revenue recognition over time	25	1	85	22
From services not yet rendered	1,360	287	1,342	175
	1,385	**288**	**1,427**	**197**

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Amounts received from customers are presented as contract liabilities from revenue recognition over time to the extent that they exceed the Bosch Group's performance reported as sales revenue. Contract liabilities from services not yet rendered mainly comprise advance payments received from contracts that are within the scope of IFRS 15, other advance payments, and the obligations from services invoiced, but not yet rendered.

22 Other liabilities and other provisions

Other liabilities

Figures in millions of euros

	2019		2018	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Accruals in the personnel area	2,076		2,671	
Accruals in the sales and marketing area	1,432		1,408	
Other accruals	982		868	
Tax liabilities (without income tax liabilities)	734		693	
Deferred income	283	104	245	97
Sundry other liabilities	357	68	344	86
	5,864	**172**	**6,229**	**183**

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The accruals in the personnel area mainly relate to vacation and salary entitlements as well as accrued special payments, while those in the sales and marketing area mainly pertain to bonus and commission payments.

Other provisions (without income tax provisions and pension provisions)

Figures in millions of euros

	2019		2018	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Tax provisions (without income tax provisions)	54	17	35	39
Provisions in the personnel area	1,065	2,435	684	1,989
Provisions in the sales and marketing area	2,070	1,182	1,848	1,073
Sundry other provisions	1,785	1,135	1,667	1,010
	4,974	**4,769**	**4,234**	**4,111**

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Provisions developed as follows:

Figures in millions of euros

	12/31/2018	IFRS 16	1/1/2019	Changes in consolidated group	Amounts used	Amounts reversed	Increase	Currency	12/31/2019
Tax provisions	835		835	–5	–190	–153	141		628
Provisions in the personnel area	2,673		2,673	–58	–530	–104	1,522	–3	3,500
Provisions in the sales and marketing area	2,921		2,921	–72	–1,188	–476	2,054	13	3,252
Sundry other provisions	2,677	–15	2,662	–3	–345	–335	943	–2	2,920
	9,106	**–15**	**9,091**	**–138**	**–2,253**	**–1,068**	**4,660**	**8**	**10,300**

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Of the increase in provisions, an amount of EUR 35 million (previous year: EUR 40 million) relates to the reversal of discount.

Provisions in the personnel area relate to obligations from personnel adjustment measures, long-service bonuses, early phased retirement, and from other special benefits. Provisions in the sales and marketing area mainly take account of losses from delivery and warranty obligations, including risks from recall, exchange, and product liability cases. Other provisions are recognized, among other things, for risks from purchasing obligations, environmental protection obligations, litigation risks, and legal risks.

In May 2019, the Stuttgart public prosecutor's office terminated its proceedings against Bosch relating to diesel vehicle emissions. The fine amounted to 90 million euros. Bosch cooperated fully with the Stuttgart public prosecutor's office in investigating the matters in question and decided not to appeal. The monetary fine proceedings against Bosch in its capacity as a supplier of engine control units for diesel engines have thus been concluded, and the decision is final and unappealable. The preliminary investigations by the Stuttgart public prosecutor's office into individual associates are still ongoing, as are investigations by authorities outside Germany into other automakers and, in some cases, into Bosch in its capacity as a supplier of engine control units.

With respect to the incidents concerning various automakers' diesel vehicle emissions, Bosch also remains a defendant in some of the many class and individual civil-law actions around the world. This includes the U.S. and Canada, among other countries. These pending actions, as well as further actions that are threatened, pose risks. In all these proceedings, Bosch is asserting its rights. A total of some 450 million U.S. dollars has so far been paid to settle civil-law disputes. In doing so, Bosch neither acknowledges the allegations brought forward by the plaintiffs, nor does it acknowledge any guilt.

Bosch is also engaged in discussions with customers regarding compensation in respect of potential civil-law risks associated with antitrust proceedings that have come to an end. In addition, investigations are still ongoing into the French subsidiary of BSH Hausgeräte concerning a possible breach of antitrust law.

On the basis of the facts relating to antitrust law and engine control units that were available when the consolidated financial statements were prepared and that the board of management has assessed, the board of management believes that sufficient precautions have been taken in the form of provisions for legal risks. For the various legal risks outlined above, provisions throughout the group amount to EUR 881 million.

Contingent liabilities and other financial obligations
No provisions were recognized for the following contingent liabilities, as it is more likely than not that they will not occur:

Figures in millions of euros

	2019	2018
Contingent liabilities related to notes issued and transferred	12	13
Contingent liabilities from guarantees	32	24
Other contingent liabilities	18	10
	62	**47**

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23 Pension provisions and similar obligations

The workforce of the companies included in the consolidated financial statements have certain rights in connection with the company pension scheme, depending on the conditions existing in the various countries. The benefit obligations include both currently claimed benefits and future benefit obligations of active associates or associates that have left the company.

The group’s post-employment benefits include both defined contribution plans and defined benefit plans. In the case of defined contribution plans, the company pays contributions to state or private pension or insurance funds, either voluntarily or based on legal or contractual provisions. No further payment obligations arise for the company from the payment of these contributions. The defined benefit plans are funded or unfunded pension systems, or systems financed by insurance premiums.

Plan assets are invested based on the underlying promised defined benefits. Asset-liability studies are performed for this purpose regularly. The funding status is an important controlling variable in this context. Bosch continuously monitors it with the involvement of external experts. The investment policy is derived from the corresponding governance guidelines. External asset managers are tasked with handling the investment of assets.

The major defined benefit plans and post-employment medical-care plans operated by the Bosch Group are described below. These plans are subject to actuarial risks such as longevity risks, interest fluctuation risks, and capital market risks.

Germany
The company pension scheme (*"Bosch bAV Plan"*), introduced on January 1, 2006, is a defined contribution plan with salary-based contributions for accumulating retirement benefits and additional benefits in the event of occupational disability or death. The Bosch *bAV Plan* is partly funded via an external pension fund, Bosch Pensionsfonds AG. The value of the assets of the external pension fund is offset against the pension obligation calculated using the projected unit credit method.

During the vesting period, employer and employee contributions are added to the assets of Bosch Pensionsfonds AG up to the tax-allowed ceiling. Contributions that exceed the tax-allowed ceiling are allocated to the unfunded obligation. The benefit amount rises in line with the performance of Bosch Pensionsfonds. Grandfather provisions were transferred to the *Bosch bAV Plan*. For a constantly decreasing number of associates in the vesting period, a transitional arrangement guarantees a fixed rate of return on the defined benefit obligation.

As the amount of additional benefits promised in the event of occupational disability or death is not tied to years of service, these additional benefits are accounted for only when the event triggering payment of the benefits occurs.

On reaching retirement, or in the event of occupational disability or death, the earned benefits are paid out in the form of a lump-sum payment, pension payments, or a lifelong annuity. Beneficiaries who reach retirement from January 1, 2016, onward receive a fund-based retirement pension payment through Bosch Pensionsfonds. Owing to the low likelihood of claims being made on Bosch, the plan is treated as a defined contribution plan from the start of the pension.

Japan
The majority of the pension obligations are corporate pension plans (CPPs), generally in the form of funded career average pension plans. The benefits are based on salary-based contributions that are subject to interest. The rate of return depends on the structure of the plan.

There are also obligations from unfunded retirement allowance plans (RAPs), the benefits of which are based on years of service and final salary.

All the benefits are paid out in the form of lump-sum payments on termination, death, or reaching retirement age. Annuity payments are possible for associates in some CPPs after a certain period of service.

Switzerland
Bosch has a funded pension plan. The Bosch pension plan is organized as a foundation. All the demographic and financial risks are borne by the foundation and regularly assessed by the foundation's board of trustees. In the case of a deficit, adjustments can be made such as a change in the pension factors or an increase in future contributions.

Pension plans are governed by the BVG [*Bundesgesetz über die berufliche Alters-, Hinterlassenen- und Invalidenvorsorge*: Swiss Pension Fund Law]. All benefits are defined by law, and the BVG stipulates the minimum benefits to be paid. The Bosch pension plan meets all legal requirements.

Both employer and employees make contributions to the Bosch pension plan. The benefits are paid out either as a lump sum or a lifelong annuity.

United Kingdom
Bosch finances a closed final-salary-based defined benefit plan. The obligation is funded via a trust association which is legally independent of Bosch, and which is operated in accordance with the law. The trustees are required to comply with the legal requirements. The plan has a deficit that is being closed through a restructuring plan.

The benefits earned are paid out on reaching retirement age, or in the event of occupational disability or death.

United States
Bosch maintains the Bosch pension plan and seven additional smaller pension plans, all of which are funded and in line with the ERISA requirements. The legal minimum funding requirements therefore apply to these plans. The Bosch pension plan is a cash balance plan under which the benefits depend on age, years of service, and salary. Benefits are paid out on reaching retirement age or in the event of death. The plan does not accept new members.

Two unfunded pension plans are also closed for new members; these provide benefits for certain members of management or for members of the Bosch pension plan whose income lies above the statutory contribution assessment basis. The benefits depend on age, years of service, and salary, and are paid out on reaching retirement age or in the event of death.

In addition, Bosch finances 12 unfunded plans for post-employment medical care. Nine plans are already closed. The level of benefits and the contributions for pensioners vary depending on location, age, and years of service. The benefits include healthcare benefits and life assurance contributions for pensioners and their spouses.

Actuarial calculations and estimates are made for all defined benefit plans. Besides assumptions about life expectancy, and taking index-linked developments into account, the calculations are based on the following parameters, which vary from one country to another depending on local economic circumstances:

Percentage figures

	Germany		Japan		Switzerland		U.K.		U.S.		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Discount factor	1.0	1.8	0.3	0.3	0.2	0.8	2.0	2.9	3.2	4.2	1.3	2.0
Projected salaries	3.0	3.0	2.3	2.3	1.5	1.5	2.7	2.9	3.5	3.5	3.0	3.0
Projected pensions	1.5	1.8	n.a.	n.a.	n.a.	n.a.	2.9	3.0	n.a.	n.a.	1.4	1.6

n.a. not applicable

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To determine the discount factor in the euro zone, reference was made to bonds rated AA by at least one rating agency as of the reporting date. The discount factor is calculated for all regions in accordance with IAS 19.

Projected salaries are future salary increases estimated on the basis of the economic situation and inflation, among other factors.

The pension plans are measured using the current mortality tables as of December 31 of the fiscal year concerned. As of December 31, 2019, the following mortality tables are used:

Germany	Heubeck 2018G mortality tables
Japan	2015 MHLW Standard Table
Switzerland	BVG 2015 generation tables for pensioners, BVG 2015 P24 for future beneficiaries
United Kingdom	105 percent for males, 96 percent for females of S2PXA tables with 2017 CMI projections and 1.25 percent long-term improvement
United States	Pri-2012, projected by MP2019; aggregate for some plans, collar adjustments for others

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As of December 31, 2018, the following mortality tables were used in the key countries:

Germany	Heubeck 2018G mortality tables
Japan	2015 MHLW Standard Table
Switzerland	BVG 2015 generation tables for pensioners, BVG 2015 P23 for future beneficiaries
United Kingdom	105 percent for males, 96 percent for females of S2PXA tables with 2017 CMI projections and 1.25 percent long-term improvement
United States	RP2006, projected by MP2018; aggregate for some plans, collar adjustments for others

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For the key regions, the present value of the defined benefit obligation can be reconciled to the provision as follows:

Figures in millions of euros

	Present value of the obligation	Plan assets	Other assets	Unrecognized asset	Provision
12/31/2019					
Germany	16,006	–4,024			11,982
Japan	250	–298	11	70	33
Switzerland	908	–914	12		6
United Kingdom	383	–354	9		38
United States	1,881	–1,719	9		171
Other	642	–226	2		418
	20,070	**–7,535**	**43**	**70**	**12,648**
12/31/2018					
Germany	14,309	–3,593			10,716
Japan	245	–269	6	49	31
Switzerland	1,083	–1,079	13	2	19
United Kingdom	325	–300	11		36
United States	1,734	–1,502	13		245
Other	572	–206	2		368
	18,268	**–6,949**	**45**	**51**	**11,415**

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The development of the net liability of the defined benefit obligation is presented in the following table:

Figures in millions of euros

	Present value of the obligation	Plan assets	Other assets	Unrecognized asset	Provision
1/1/2019	**18,268**	**–6,949**	**45**	**51**	**11,415**
Pension cost charged to profit or loss					
Current service cost	624				624
Past service cost	1				1
Gains from plan settlements not related to past service cost	–30				–30
Net interest income/expense	363	–154			209
Other		5			5
	958	**–149**	**0**	**0**	**809**
Remeasurement					
Return on plan assets (excluding amounts included in net interest)		–925			–925
Losses arising from changes in demographic assumptions	48				48
Losses arising from changes in financial assumptions	1,513				1,513
Experience losses	424				424
Other adjustments				16	16
	1,985	**–925**	**0**	**16**	**1,076**
Contributions					
Employer		–419			–419
Beneficiaries	19	–19			0
	19	**–438**	**0**	**0**	**–419**
Benefits paid[1]	–776	669			–107
Special effects (plan settlement)	0	0			0
Transfers	23	–23			0
Currency translation	90	–89		3	4
Changes in consolidated group	–497	369			–128
Changes in other assets			–2		–2
12/31/2019	**20,070**	**–7,535**	**43**	**70**	**12,648**

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1. Including EUR 51 million for transfer payments to Bosch Pensionsfonds at the beginning of the pension phase for payment of a fund-based retirement pension.

Figures in millions of euros

	Present value of the obligation	Plan assets	Other assets	Unrecognized asset	Provision
1/1/2018	**17,694**	**–6,909**	**31**	**73**	**10,889**
Pension cost charged to profit or loss					
Current service cost	589				589
Past service cost[1]	5				5
Gains from plan settlements not related to past service cost	0				0
Net interest income/expense	374	–153		0	221
Other		4			4
	968	**–149**	**0**	**0**	**819**
Remeasurement					
Return on plan assets (excluding amounts included in net interest)		392			392
Losses arising from changes in demographic assumptions	55				55
Losses arising from changes in financial assumptions	167				167
Experience gains	–42				–42
Other adjustments		0		–26	–26
	180	**392**	**0**	**–26**	**546**
Contributions					
Employer		–399			–399
Beneficiaries	18	–18			0
	18	**–417**	**0**	**0**	**–399**
Benefits paid[2]	–697	251			–446
Special effects (plan settlement)	–5	5			0
Transfers	0	0			0
Currency translation	109	–122		4	–9
Changes in consolidated group	1	0			1
Changes in other assets			14		14
12/31/2018	**18,268**	**–6,949**	**45**	**51**	**11,415**

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1. Mainly due to the increase in the maximum statutory gratuity payment in India.
2. Including EUR 48 million for transfer payments to Bosch Pensionsfonds at the beginning of the pension phase for payment of a fund-based retirement pension.

The plan assets comprise the following components:

Percentage figures

	Germany		Japan		Switzerland		U.K.		U.S.	
	2019	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**
Cash and cash equivalents	**1**	**1**	**1**	**1**	**1**	**1**			**1**	**1**
Equity instruments	**40**	**34**	**29**	**26**	**30**	**27**	**37**	**36**	**40**	**43**
of which Europe	56	57	12	12	43	45	41	42	16	13
of which North America	20	21	39	37	34	33	35	35	69	71
of which Asia Pacific	13	13	49	51	7	7	20	20	7	8
of which emerging markets	9	8			13	13	4	3	7	7
of which other	2	1			3	2			1	1
Debt instruments	**48**	**47**	**66**	**69**	**32**	**32**	**59**	**60**	**59**	**56**
of which government bonds	40	39	83	77	19	18	50	50	18	30
of which corporate bonds	57	58	11	16	60	61	50	50	81	66
of which other debt instruments	3	3	6	7	21	21			1	4
Property	**2**	**9**			**34**	**36**				
of which owner-occupied	78	20								
of which non-owner-occupied	22	80			100	100				
Insurance	**2**	**3**	**4**	**4**			**4**	**4**		
Other	**7**	**6**			**3**	**4**				

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Quoted prices in an active market are available for cash and equity instruments. For the other classes of assets, there are in most cases no quoted prices in an active market. Investments in infrastructure and investments in special funds are reported under “Other.”

Duration and estimated maturities of the pension obligation

The weighted duration of the pension obligation as of December 31, 2019, is 14.8 years (previous year: 13.8 years).

Estimated maturities of the undiscounted estimated pension payments

Figures in millions of euros

	2019	**2018**
Less than one year	807	772
Between one and two years	776	763
Between two and three years	818	802
	2,401	**2,337**

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The estimated additions to plan assets in the fiscal year 2020 amount to EUR 444 million (previous year: EUR 383 million).

The estimated benefits to be paid directly in the fiscal year 2020 amount to EUR 503 million (previous year: EUR 484 million).

Sensitivity of the defined benefit obligations in relation to actuarial parameters

Percentage figures

	Germany		Japan		Switzerland		U.K.		U.S.	
	2019	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**	**2019**	**2018**
Discount factor										
Increase of 0.5 percentage points	–5.0	–4.8	–4.1	–4.3	–5.8	–5.5	–8.1	–7.4	–6.0	–5.7
Decrease of 0.5 percentage points	5.6	5.1	4.5	4.6	7.1	6.2	9.4	8.3	6.7	6.4
Projected salaries										
Increase of 0.25 percentage points	n.a.	0.1	0.8	0.8	0.2	0.2	0.4	0.5	0.0	0.0
Decrease of 0.25 percentage points	n.a.	–0.1	–0.8	–0.7	–0.2	–0.2	–0.4	–0.5	0.0	0.0
Projected pensions										
Increase of 0.25 percentage points	0.6	0.7	n.a.	n.a.	2.5	2.5	1.7	1.7	n.a.	n.a.
Decrease of 0.25 percentage points	–0.6	–0.6	n.a.	n.a.	–2.4	–2.4	–1.7	–1.6	n.a.	n.a.
Life expectancy										
Increase by one year	2.2	2.4	n.a.	n.a.	3.0	2.9	3.6	3.2	2.6	2.4

n.a. not applicable

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The sensitivity analyses of the defined benefit obligation for the main actuarial assumptions are based on the same methods as those used for the post-employment benefit obligations presented in the consolidated statement of financial position (projected unit credit method). In each case, one assumption was changed and the other assumptions left unchanged. This means that possible correlation effects were not considered.

Defined contribution plans

Expenses for defined contribution plans amounted to EUR 1,449 million (previous year: EUR 1,368 million).

Provision for long-service bonuses

Expenses for additions to the provision for long-service bonuses amounted to EUR 88 million (previous year: EUR 63 million).

24 Equity

The issued capital of EUR 1,200 million and capital reserve of EUR 4,557 million correspond with the items of the statement of financial position disclosed by Robert Bosch GmbH. The issued capital is divided between the shareholders as follows:

Shareholders of Robert Bosch GmbH

Percentage figures

	Shareholding	Voting rights
Robert Bosch Stiftung GmbH	92.0	
Robert Bosch Industrietreuhand KG		93.2
Bosch family	7.4	6.8
Robert Bosch GmbH (treasury stock)	0.6	

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Retained earnings contain profits that have not been distributed and that were generated in the past by the entities included in the consolidated financial statements, as well as accumulated other comprehensive income. The effects of changes in actuarial parameters in the pension provisions are disclosed in the “Other changes” column of accumulated other comprehensive income. This line item also contains differences between purchase price and purchased pro-rata equity of additional share purchases.

Retained earnings also include treasury stock of EUR 62 million.

The unappropriated earnings of the group match those of Robert Bosch GmbH.

Non-controlling interests

The non-controlling interests in the equity of the consolidated subsidiaries mainly comprise the non-controlling interests in United Automotive Electronic Systems Co., Ltd., Shanghai, Bosch Automotive Diesel Systems Co., Ltd., Wuxi, Bosch HUAYU Steering Systems Group, Shanghai, all China, and Bosch Ltd., Bengaluru, India.

Other notes

25 Statement of cash flows

The statement of cash flows presents cash inflows and outflows from operating activities, investing activities, and financing activities.

The cash flow is derived indirectly, starting from EBIT. EBIT is earnings before taxes and before the financial result. Cash inflows from operating activities are adjusted for non-cash expenses and income (mainly depreciation and amortization of non-current assets), and take into account cash-effective financial expenses, financial income, and taxes, as well as changes in working capital.

Investing activities mainly comprise additions to non-current assets, including leased assets, the acquisition and disposal of subsidiaries and other operating units, and the purchase and disposal of securities.

Financing activities combine the cash inflows and outflows from borrowing and repayment of financial liabilities, as well as from dividends. As of 2019, they also include the repayment of lease liabilities.

Changes in items of the statement of financial position contained in the statement of cash flows cannot be directly derived from the statement of financial position, as they have been adjusted for exchange-rate effects and changes in the consolidated group.

The liquidity contained in the statement of cash flows includes cash of EUR 4,558 million (previous year: EUR 4,716 million). In the fiscal year, there were contractual cash transfer restrictions of EUR 5 million.

Changes in liabilities from financing activities during the fiscal year are presented in the following table:

Figures in millions of euros

		Cash effective changes		Non-cash changes		
	1/1/2019	**Borrowing**	**Repayment**	**Changes in consolidated group, other changes**	**Exchange rate-related changes**	**12/31/2019**
Financial liabilities	5,236	28	–608	–8		4,648
Lease liabilities	2,115		–497	485	8	2,111
	7,351	**28**	**–1,105**	**477**	**8**	**6,759**

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Financial liabilities comprise current and non-current bonds, promissory note loans, and liabilities to banks.

26 Segment reporting

Disclosures on business sectors

Figures in millions of euros

	Mobility Solutions		Industrial Technology		Consumer Goods	
	2019	**2018**	**2019**	**2018**	**2019**	**2018**
External sales	46,784	47,567	7,494	7,443	17,752	17,812
Intersegment sales	1	9	2	56		33
Total sales	46,785	47,576	7,496	7,499	17,752	17,845
EBIT	756	3,531	897	687	1,041	1,149
of which: profit from entities accounted for using the equity method	–7	–14				
Non-cash expenses (without depreciation and amortization)	3,414	2,217	558	402	812	773
Amortization and depreciation of intangible assets, right-of-use assets, and property, plant, and equipment	3,562	2,889	243	213	1,009	809
Impairment losses on intangible assets, right-of-use assets, and property, plant, and equipment	163	57			30	6
Non-cash income	771	719	107	270	105	390
Assets	15,661	14,568	2,677	3,105	7,181	7,502
Liabilities	3,776	3,299	458	558	1,838	1,946
Investments measured at equity	4	19				

Energy and Building Technology		All other segments		Consolidation		Group	
2019	2018	2019	2018	2019	2018	2019	2018
5,654	5,569	37	74			77,721	78,465
11	9		5	−14	−112		
5,665	5,578	37	79	−14	−112	77,721	78,465
290	266	−81	−131			2,903	5,502
						−7	−14
392	287	16	19			5,192	3,698
200	155	34	31			5,048	4,097
2	1		52			195	116
150	97	2	20			1,135	1,496
1,589	1,724	6	43			27,114	26,942
302	299	12	14			6,386	6,116
						4	19

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Based on the internal management and reporting structure, the Bosch Group is divided into four business sectors. These are the reportable segments and result from the combination of divisions in accordance with the criteria set forth in IFRS 8 *Operating Segments*. Business operations within the business sectors are the responsibility of the divisions.

The Mobility Solutions business sector mainly comprises the following areas of business: powertrain products and solutions, systems for active and passive driving safety, assistance and convenience functions, technology for user-friendly infotainment as well as vehicle-to-vehicle and vehicle-to-infrastructure communication, concepts, technology, and services for the automotive aftermarket, steering systems for passenger cars and commercial vehicles, and connected mobility services.

The Industrial Technology business sector combines the following activities:

- ▶ Automation technology (technologies for drives, controls, and motion)
- ▶ Packaging technology (machines and packing lines for the confectionery, food, beverage, and tobacco industry, as well as for the pharmaceuticals industry; this division was sold in the fiscal year effective December 31)
- ▶ Industry 4.0 software activities and projects

The operations of the Consumer Goods business sector comprise the production and distribution of

- ▶ Power tools (tools for the trade, industry, and DIY, accessories, garden tools, as well as industrial tools and measuring equipment)
- ▶ Household appliances (appliances for cooking, washing-up, washing, drying, cooling, freezing, floor care, etc.).

The Energy and Building Technology business sector comprises the following activities:

- ▶ Security systems (video surveillance, public address systems, evacuation systems, and access control)
- ▶ Services to increase energy-efficiency in non-residential buildings
- ▶ Thermotechnology (heating systems and hot-water boilers including open- and closed-loop control systems)
- ▶ Service solutions (business solutions for internal and external customers, shared services for the Bosch Group)

Business segments which are not reportable are combined and presented in the category “All other segments.” This mainly relates to financial, holding, and other service companies as well as the remaining activities in the photovoltaics area.

The divisions allocated to a business sector are aggregated into a single reportable segment as they have similar economic characteristics. Above all, the economic performance of all the divisions aggregated in one segment depends to a similar extent on the same core markets (automotive production, capital goods, consumer goods, and energy and building technology).

Items attributable to financing activities are not included in segment reporting.

The main controlling variables reported to the board of management are EBIT and, as an internal indicator, the operating value contribution.

Transfer prices between the business segments are determined at arm’s length.

The main items included in non-cash expenses are bad debt allowances, additions to provisions, as well as losses on the disposal of items of property, plant, and equipment, and of intangible assets.

The main item included in non-cash income is income from the reversal of provisions.

Segment assets comprise trade receivables as well as inventories, in both cases before valuation allowances. Segment liabilities contain trade payables. Items relating to segment assets and segment liabilities are presented at average amounts for the year.

Reconciliation statements

Figures in millions of euros

	2019	2018
Sales		
Sales by reportable segment	77,698	78,498
Sales of all other segments	37	79
Consolidation	–14	–112
Group sales	**77,721**	**78,465**
Result		
EBIT by reportable segment	2,984	5,633
EBIT of all other segments	–81	–131
Financial income	2,301	1,956
Financial expenses	–1,948	–2,391
Profit before tax	**3,256**	**5,067**
Assets		
Assets by reportable segment	27,108	26,899
Assets of all other segments	6	43
Reconciliation to values at December 31	141	982
Valuation allowances on segment assets	–2,248	–2,050
Other current assets	11,377	10,294
Non-current assets	52,646	47,486
Group assets	**89,030**	**83,654**
Liabilities		
Liabilities by reportable segment	6,374	6,102
Liabilities of all other segments	12	14
Reconciliation to values at December 31	1,287	1,511
Other current liabilities	14,503	13,936
Non-current liabilities	25,775	22,915
Group liabilities	**47,951**	**44,478**

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Disclosures by important countries

Figures in millions of euros

	Sales by registered office of the customer		Non-current assets[1]	
	2019	**2018**	**2019**	**2018**
Europe	**40,817**	**41,412**	**21,865**	**20,493**
of which Germany	15,705	16,093	13,564	12,973
of which the United Kingdom	3,571	3,693	395	394
of which France	3,180	3,109	459	428
of which Italy	2,250	2,456	611	520
Americas	**14,433**	**13,710**	**4,240**	**3,589**
of which the United States	10,911	10,497	3,591	3,030
Asia	**21,405**	**22,266**	**7,813**	**7,152**
of which China	13,547	14,426	5,474	5,036
of which Japan	2,699	2,497	575	508
Other regions	**1,066**	**1,077**	**156**	**137**
Group	**77,721**	**78,465**	**34,074**	**31,371**

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1. Non-current assets consist of intangible assets, right-of-use assets, and property, plant, and equipment.

The customer structure of the Bosch Group in the reporting period does not reveal any concentration on individual customers.

27 Additional notes on financial instruments

Net gain/loss by category
The table below presents the net gains and losses from financial instruments recognized in the income statement, classified by the categories defined in IFRS 9:

Figures in millions of euros

	2019	2018
Financial assets, measured at amortised cost (AC)	145	57
Financial assets, measured at fair value through other comprehensive income (FVOCI wR)	267	302
Financial assets and financial liabilities, measured at fair value through profit or loss (FVPL)	177	–280
Equity instruments, measured at fair value through other comprehensive income (FVOCI nR)	133	144
Financial liabilities, measured at amortised cost (AC)	–224	–526

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The net gain/loss contains gains and losses from measuring receivables and loans, from the reversal of the gains/losses on financial instruments in equity, exchange-rate gains and losses, interest income and expenses, investment income, dividend income, and gains and losses from derivatives. The net gains and losses from investments in equity instruments contain dividend income totaling EUR 5 million (previous year: EUR 5 million) from equity instruments derecognized in the fiscal year.

The measurement gains and losses from securities and equity investments recognized in other comprehensive income are presented in the statement of comprehensive income.

Carrying amounts and fair values by category

Figures in millions of euros

		2019		2018	
	Category pursuant to IFRS 9	Carrying amount	Fair value	Carrying amount	Fair value
Assets					
Cash and cash equivalents	AC	**4,558**		**4,716**	
Trade receivables	AC	**14,024**		**14,859**	
Current other financial assets		**3,400**		**2,276**	
Securities	FVPL	858	858	1,210	1,210
	FVOCI wR	123	123	126	126
Bank balances	AC	858		136	
Loan receivables	AC	268		192	
Derivatives	FVPL	86	86	123	123
Receivables from finance leases	n.a.	36		35	
Sundry other financial assets	AC	1,171		454	
Non-current financial assets		**14,859**		**12,558**	
Securities	FVOCI nR	3,081	3,081	2,546	2,546
	FVOCI wR	5,045	5,045	4,877	4,877
	FVPL	4,140	4,140	2,871	2,871
Investments	FVPL	86	86	73	73
	FVOCI nR	1,639	1,639	1,551	1,551
	n.a.	159		241	
Bank balances	AC	304	304	3	3
Loan receivables	AC	32	33	36	37
Derivatives	FVPL	23	23	5	5
Receivables from finance leases	n.a.	159	159	153	153
Other financial assets	AC	191	191	202	203

Figures in millions of euros

		2019		2018	
	Category pursuant to IFRS 9	Carrying amount	Fair value	Carrying amount	Fair value
Equity and liabilities					
Trade payables	AC	**7,673**		**7,627**	
Current other financial liabilities		**1,417**		**1,591**	
Bonds	AC	499		300	
Promissory loans	AC			154	
Liabilities to banks	AC	143		269	
Loans	AC	73		71	
Derivatives	FVPL	58	58	76	76
Finance lease obligations	n.a.			7	
Sundry other financial liabilities	AC	644		714	
Non-current financial liabilities		**4,149**		**4,652**	
Bonds	AC	2,505	2,909	3,001	3,316
Promissory loans	AC	1,498	1,549	1,498	1,505
Liabilities to banks	AC	3	3	14	15
Loans	AC	31	34	30	32
Derivatives	FVPL	8	8	5	5
Finance lease obligations	n.a.			18	
Other financial liabilities	AC	104	105	86	85

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AC	At amortized cost
FVPL	At fair value through profit or loss
FVOCI wR	At fair value through other comprehensive income, with recycling
FVOCI nR	At fair value through other comprehensive income, no recycling
n.a.	Not applicable

The carrying amounts of the financial assets and liabilities, classified by IFRS 9 measurement categories, are as follows:

Figures in millions of euros

	2019	2018
Financial assets, measured at amortised cost (AC)	21,406	20,598
Financial assets, measured at fair value through other comprehensive income (FVOCI wR)	5,168	5,003
Equity instruments, measured at fair value through other comprehensive income (FVOCI nR)	4,720	4,097
Financial assets, measured at fair value through profit or loss (FVPL)	5,193	4,282
Financial liabilities, measured at fair value through profit or loss (FVPL)	66	81
Financial liabilities, measured at amortised cost (AC)	13,173	13,764

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The fair values of financial assets and financial liabilities measured at fair value are determined using the fair value hierarchy in accordance with IFRS 13 presented in the tables below:

Figures in millions of euros

		2019			
	Category pursuant to IFRS 9	Level 1[1]	Level 2[2]	Level 3[3]	Total
Financial assets					
Securities	FVPL	247	4,586	165	4,998
	FVOCI wR	70	5,098		5,168
	FVOCI nR	3,081			3,081
Investments	FVPL			86	86
	FVOCI nR	446		1,193	1,639
Derivatives	FVPL	3	106		109
Financial liabilities					
Derivatives	FVPL	2	64		66

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1. Fair value is measured on the basis of listed, unadjusted market prices in active markets
2. Fair value is measured on the basis of market data such as share prices, exchange rates, or interest curves using market-based valuation techniques
3. Fair value is measured on the basis of unobservable market data

Figures in millions of euros

	Category pursuant to IFRS 9	Level 1[1]	Level 2[2]	Level 3[3]	2018 Total
Financial assets					
Securities	FVPL	939	3,047	95	4,081
	FVOCI wR	72	4,931		5,003
	FVOCI nR	2,545	1		2,546
Investments	FVPL			73	73
	FVOCI nR	335		1,216	1,551
Derivatives	FVPL	3	125		128
Financial liabilities					
Derivatives	FVPL	1	80		81

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1. Fair value is measured on the basis of listed, unadjusted market prices in active markets
2. Fair value is measured on the basis of market data such as share prices, exchange rates, or interest curves using market-based valuation techniques
3. Fair value is measured on the basis of unobservable market data

The fair value of financial assets and liabilities measured at amortized cost is determined on the basis of observable market data such as share prices, exchange rates, or interest curves (level 2).

At the end of the fiscal year, items are reviewed to determine whether they need to be reclassified between individual levels of the fair-value hierarchy. In the fiscal year, there were no reclassifications between levels 1 and 2. The table presenting the changes in financial assets allocated to level 3 includes reclassifications relating to this level.

Equity investments measured at fair value through profit or loss and those measured at fair value through other comprehensive income are allocated to level 3. The fair values are determined on the basis of company data mainly using the discounted cash flow method.

Units in a closed fund are also allocated to level 3 (reported under securities). The fair value of the fund units is notified by the asset management firm; it is measured based on the fund’s net asset value. The fair value is dependent on the changes in the market value of the respective investments within the fund.

Changes during the fiscal year and the previous year in financial assets allocated to level 3 are presented in the tables below:

Figures in millions of euros

	1/1/2019	Additions	Disposals	Reclassifications	Changes recognized in other comprehensive income	Changes recognized in profit or loss	Currency	12/31/2019
Investments FVOCI nR	1,216	122	–584	–7	443		3	1,193
Investments FVPL	73	13	–4			4		86
Securities	95	60				10		165

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On account of the initial public offering of one entity in the fiscal year 2019, the Bosch Group’s corresponding investment in this entity was reclassified from level 3 to level 1.

Figures in millions of euros

	1/1/2018	Additions	Disposals	Changes recognized in other comprehensive income	Changes recognized in profit or loss	Currency	12/31/2018
Investments FVOCI nR	782	333	–6	99		8	1,216
Investments FVPL	60	15	–8		6		73
Securities	66	21			8		95

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Changes recognized in profit or loss are presented in the financial result, while changes recognized in other comprehensive income are reported in the reserve from financial instruments.

28 Capital and risk management

Capital management
The main objective of the centralized capital management of the Bosch Group is to maintain the company's sound financial substance and thus to secure the financial independence and flexibility required for further growth.

The main controlling variables of our system of financial targets are EBIT and, as an internal indicator, the operating value contribution. The operating value contribution is calculated by deducting the cost of capital from EBIT. Additional adjustments are also made in certain other respects, such as recognition of impairment losses, pension provisions, and provisions for losses arising from delivery commitments. The development of the controlling variable is the yardstick used to assess performance. It is also used for portfolio management. It is supplemented for capital management purposes by the conventional financial, liquidity, and indebtedness indicators.

Hedging policy and financial derivatives
The business operations of the Bosch Group are impacted in particular by fluctuations in exchange and interest rates as well as commodity price risks on the procurement side. Business policy aims to limit these risks by means of hedging. All hedging transactions are managed at corporate level.

Internal regulations and guidelines set down a mandatory framework and define the responsibilities relating to investment and hedging transactions. According to these regulations, derivatives may only be used in connection with business operations, financial investments, or financing transactions; speculative transactions are not allowed. Trading limits are an important component of the guidelines. Hedges are concluded solely via banks whose creditworthiness is regarded as impeccable. The rating given by leading agencies as well as current risk assessments in financial markets are taken into account. The creditworthiness of the banking partners of the Bosch Group is closely monitored and the risk mitigated by counterparty limits.

To reduce the credit risk of the bank, fixed term deposits are in some cases entered into as secured deposits in tri-party repo transactions. In such cases, the bank provides predefined securities as collateral. The transactions themselves, as well as the management and valuation of the securities, are managed by a clearing center. For details, please refer to note 10 "Cash and cash equivalents."

The decision-making bodies are committees for commodities, foreign currencies, and investments that meet at regular intervals. There is a functional and spatial segregation of trading, settlement, and control functions. Key tasks of the control function include determining risks using the value-at-risk method as well as the basis-point-value method, and ongoing compliance checks with instructions and guidelines.

Each month, the risk of financial investments is calculated using the value-at-risk concept for the next month. Prescribed risk limits for the various investment categories limit the potential loss. The forecast quality of the value-at-risk method is tested by means of monthly backtesting. Management is informed monthly about risk analyses and the results of investments and hedges.

Currency risks
Currency risks of business operations are mitigated by the central management of selling and purchasing currencies. The currency risk is determined on the basis of the worldwide consolidated cash flow in the respective currencies. Based on the business plan, estimated inflows and outflows in the various currencies for the planning period are aggregated in a foreign exchange balance plan. The resulting net position is used for the central management of currency exposures.

The largest net currency positions of the planned cash flow are in CNY, GBP, and HUF.

Hedging largely takes the form of forward exchange contracts; currency options and currency swaps to secure group financing are used to a lesser extent. These transactions, which are only entered into with banks, are subject to minimum requirements with respect to nature, scope, and complexity.

The risk attaching to material operating foreign currency items is determined using the value-at-risk concept, supplemented by worst-case analyses. These risk analyses and the hedge result are determined monthly and presented to management.

To present the currency risks for the most important foreign currencies in accordance with IFRS 7 *Financial Instruments: Disclosures*, all monetary assets and monetary liabilities denominated in foreign currency for all consolidated companies were analyzed as of the reporting date and sensitivity analyses carried out for the respective currency pairs, in terms of the net risk.

A change in the EUR of 10 percent (taking the closing rate as the baseline) against the foreign currencies listed in the table would have the following implications for the profit before tax:

Figures in millions of euros

	10% increase in EUR		10% decrease in EUR	
	2019	**2018**	**2019**	**2018**
CHF	6	18	−6	−18
CNY	5	42	−5	−42
CZK	−31	−35	31	35
GBP	33	73	−33	−73
HUF	−13	−10	13	10
JPY	10	−7	−10	7
KRW	−5	4	5	−4
PLN	8	3	−8	−3
RUB	−3	−9	3	9
TRY	−38	−25	38	25
USD	11	2	−11	−2

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A change in the USD of 10 percent (taking the closing rate as the baseline) against the foreign currencies listed in the table would have the following implications for the profit before tax:

Figures in millions of euros

	10% increase in USD		10% decrease in USD	
	2019	**2018**	**2019**	**2018**
CNY	–1	8	1	–8

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The effects on earnings shown here mainly result from foreign currency positions relating to operations and from loans within the Bosch Group which, by way of an exception, were granted in a currency other than the local currency of the borrower, e.g. because it can be repaid from expected cash flows in this currency. The currency risk for the statement of financial position does not correspond to the economic risk, which is determined on the basis of forecast cash flows.

Interest-rate risks

Risks from changes in interest rates on investments and borrowings are limited by select use of derivative financial instruments, mainly interest swaps and interest futures.

An analysis of the interest risk was carried out in accordance with IFRS 7. The sensitivity analysis considered assets and liabilities subject to floating interest rates, fixed-rate securities, and interest derivatives. Pension funds and money market funds were not included.

A change in the market interest rate by 100 basis points (taking the interest rate on the cut-off date as the baseline) would have the following effect on the reserve from financial instruments recognized in equity and the profit before tax:

Figures in millions of euros

	Increase in market interest level by 100 basis points		Decrease in market interest level by 100 basis points	
	2019	**2018**	**2019**	**2018**
Reserve from financial instruments	–251	–230	251	230
Profit before tax	33	7	–33	–7

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Share-price risks

The analysis of the share-price risk in accordance with IFRS 7 took into account share portfolios, quoted investments, equity funds, and share derivatives with a total carrying amount of EUR 4,909 million (previous year: EUR 3,719 million).

A change in the share price of 10 percent (taking the share price on the reporting date as the baseline) would have the following effect on the reserve from financial instruments recognized in equity and the profit before tax:

Figures in millions of euros

	10% increase in share price		10% decrease in share price	
	2019	2018	2019	2018
Reserve from financial instruments	352	287	–352	–287
Profit before tax	139	85	–139	–85

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Other price risks

Derivatives are used to limit the risks of fluctuating commodity prices. The analysis of the commodity-price risk in accordance with IFRS 7 took into account commodity derivatives measured as of the reporting date.

A change in the forward-rate level of 10 percent (taking the forward rate on the reporting date as the baseline) would have the following effect on the profit before tax:

Figures in millions of euros

	10% increase in forward rates		10% decrease in forward rates	
	2019	2018	2019	2018
Profit before tax	44	44	–44	–44

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As of the reporting date, the Bosch Group is not aware that it is exposed to any significant other price risks as defined by IFRS 7.

Credit risks

The maximum credit risk for each category of financial instruments is the carrying amount of the financial assets recognized in the statement of financial position.

The credit risk from customer receivables is recorded and monitored on an ongoing basis. Responsibilities and duties relating to credit risks are governed by an internal directive. This mainly concerns the stipulation of payment terms, fixing of credit limits, release of deliveries, and receivables monitoring.

The credit risk for trade receivables is reduced by processing invoices with the corresponding credit notes in a single work step; the net amount is reported in the statement of financial position. This procedure is only performed if there is a legal right to offset and there is an intention to settle the receivable based on the net amount or to settle the receivable by offsetting against the corresponding liability. Moreover, trade receivables are partly secured by retention of title. For some trade receivables, collateral has been additionally provided in the form of guarantees, property liens, and mortgages.

The table below shows the remaining credit risk for trade receivables:

Figures in millions of euros

	2019	2018
Trade receivables (before offsetting of credit notes)	14,709	15,508
Offsetting of credit notes	–685	–649
Trade receivables (carrying amount)	14,024	14,859
Financial guarantee contracts (received)	–2,164	–2,065
Remaining credit risk	**11,860**	**12,794**

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The table below presents the development of loss allowances on trade receivables (credit-impaired and not credit-impaired) in the fiscal year.

Figures in millions of euros

1/1/2018	**332**
Changes in consolidated group	–1
Amounts added	105
Amounts utilized	–48
Amounts reversed	–84
Exchange-rate differences	–8
12/31/2018	**296**
Changes in consolidated group	–8
Amounts added	83
Amounts utilized	–38
Amounts reversed	–33
Exchange-rate differences	1
12/31/2019	**301**

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In the fiscal year, there were only immaterial changes compared with the previous year in the loss allowances on receivables from finance leases, contract assets, loan receivables, and other financial receivables.

The table below shows the gross carrying amounts of trade receivables:

Figures in millions of euros

	2019	2018
Trade receivables	14,325	15,155
of which credit-impaired	302	268
of which not credit-impaired	9,402	9,983
not due	8,310	8,785
up to 30 days past due	604	656
31–90 days past due	230	260
91–180 days past due	113	130
more than 180 days past due	145	152

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Derivative transactions are entered into in accordance with the German master agreement for financial forward transactions or the ISDA (International Swaps and Derivatives Association). These do not satisfy the set-off criteria of IAS 32, as netting is only enforceable in the case of insolvency.

The credit risk for derivatives with a positive market value that do not currently satisfy the set-off criteria of IAS 32 (offsetting only enforceable in the case of insolvency of the contracting party) is presented in the following table:

Figures in millions of euros

	2019	2018
Derivatives with a positive market value (carrying amount)	109	128
Amounts not offset in the statement of financial position		
Derivatives	–21	–39
Cash collateral received	–34	–17
Remaining credit risk	**54**	**72**

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Liquidity risks

Changes in financial assets and liabilities are monitored on an ongoing basis. Internal directives regulate the duties and responsibilities of liquidity management and planning. The company has liquidity reserves in the form of highly liquid assets totaling EUR 5,539 million (previous year: EUR 6,052 million). In addition to that, there is a euro commercial paper program with a volume of EUR 1,000 million and a U.S. commercial paper program with a volume of USD 2,000 million, neither of which had been drawn at the end of the reporting period.

The liquidity risk is reduced by processing invoices for trade payables with the corresponding credit notes received in a single work step. This procedure is only performed if there is a legal right to offset and there is an intention to settle the liability based on the net amount or to settle the liability by offsetting against the corresponding receivable. Moreover, collateral is provided in the form of guarantees.

The table below shows the remaining liquidity risk for trade payables:

Figures in millions of euros

	2019	2018
Trade payables (before offsetting of credit notes)	8,358	8,276
Offsetting of credit notes	–685	–649
Trade payables (carrrying amount)	7,673	7,627
Financial guarantee contracts (granted)	–9	–9
Remaining liquidity risk	**7,664**	**7,618**

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The liquidity risk for derivatives that do not currently satisfy the set-off criteria of IAS 32 (offsetting only enforceable in the case of insolvency) is presented in the following table:

Figures in millions of euros

	2019	2018
Derivatives with a negative market value (carrying amount)	66	81
Amounts not offset in the statement of financial position		
Derivatives	–21	–39
Cash collateral provided	0	–1
Remaining liquidity risk	**45**	**41**

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The undiscounted cash flows of the non-derivative and derivative financial liabilities are presented in the tables below:

Figures in millions of euros

	Carrying amount	Undiscounted cash flows					
	2019	2020	2021	2022	2023	2024	2025 ff.
Non-derivative financial liabilities							
Trade payables	7,673	7,673					
Bonds	3,004	566	552	68	48	791	1,487
Promissory loans	1,498	14	14	14	513	11	1,031
Liabilities to banks	146	147	0	0	1	1	1
Lease liabilities	2,111	548	455	309	229	177	584
Loans	104	73	6	5	5	5	11
Other financial liabilities	748	644	8	6	4	1	86
Derivatives							
Gross settlement	50						
Cash outflows		3,419	0	10			
Cash inflows		3,370	0	9			
Net settlement	16						
Cash outflows		9	7				

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Figures in millions of euros

	Carrying amount	Undiscounted cash flows					
	2018	2019	2020	2021	2022	2023	2024 ff.
Non-derivative financial liabilities							
Trade payables	7,627	7,623	4				
Bonds	3,301	375	566	552	68	48	2,278
Promissory loans	1,652	171	14	14	14	513	1,042
Liabilities to banks	283	271	14				
Lease liabilities	25	8	7	5	4	3	3
Loans	101	72	4	6	5	4	12
Other financial liabilities	800	715	14	3	6	1	62
Derivatives							
Gross settlement	41						
Cash outflows		3,315	5				
Cash inflows		3,273	5				
Net settlement	40						
Cash outflows		35	5				

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The undiscounted cash flows contain interest and principal payments. All on-call financial liabilities are allocated to the earliest possible period. The variable interest payments were calculated using the last interest rate determined before the respective reporting date.

29 Leases

Contracts that convey the right to control the use of an identified asset for a period of time in exchange for consideration are accounted for as leases in accordance with IFRS 16.

Bosch as lessee

The lessee generally recognizes leases based on the right-of-use approach. With certain exceptions, this requires recognizing assets for the right of use and liabilities for the payment obligations under the lease in the statement of financial position. These accounting requirements are not applied to short-term leases and leases for low-value assets; lease payments under such leases are recognized as an expense on a straight-line basis over the lease term. The requirements of IFRS 16 are also not applied to leases of intangible assets.

Lease liabilities are measured at the present value of the lease payments over the lease term. Lease payments include fixed payments for lease components and non-lease components as well as variable lease payments that depend on an index or an interest rate. The payments are generally discounted using the incremental borrowing rate for the appropriate currency and lease term. In determining the lease term, termination and extension options are considered if it is reasonably certain that they will be exercised.

At the commencement date, right-of-use assets are recognized at the amount of the lease liability, plus initial direct costs and less any lease incentives received. Right-of-use assets are typically depreciated over the lease term.

Entities of the Bosch Group have entered into leases as lessees mainly for land and buildings and, to a lesser extent, vehicles, plant and equipment, and other equipment, furniture, and fixtures.

The right-of-use assets recognized in the statement of financial position are as follows:

Figures in millions of euros

		2019
	Carrying amount	**Depreciation and amortization**
Land and building	1,802	388
Plant, fixtures, and furniture	51	16
Vehicles	230	125
	2,083	**529**

73

Additions to right-of-use assets came to EUR 517 million in the fiscal year.

The following amounts were recognized in the income statement:

Figures in millions of euros

	2019
Interest expenses relating to lease liabilities	58
Expenses relating to short-term leases	134
Expenses relating to leases of low-value assets	52
Expenses for variable lease payments	11

74

Cash outflows from leases totaled EUR 742 million in the fiscal year.

The following liabilities from finance leases were reported in the previous year:

Figures in millions of euros

	2018
Future minimum lease payments	
due not later than one year	9
due later than one year and not later than five years	19
due later than five years	3
Interest portion contained in the future minimum lease payments	
due not later than one year	2
due later than one year and not later than five years	4
due later than five years	0
Present value of outstanding minimum lease payments	
due not later than one year	7
due later than one year and not later than five years	15
due later than five years	3
	25

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The obligations from operating lease agreements were due as follows in the previous year:

Figures in millions of euros

	2018
Due not later than one year	534
Due later than one year and not later than five years	1,083
Due later than five years	408
	2,025

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Bosch as lessor

Lessors are required to classify a lease as either a finance lease or an operating lease.

Finance leases transfer substantially all the risks and rewards incidental to ownership to the lessee. For such leases, a receivable is recognized at the amount of the net investment in the lease and disclosed under financial assets.

The receivables from finance lease agreements mainly stem from products leased by the Building Technologies division. As a rule, the agreed lease term is ten years. The receivables are due as follows in the fiscal year:

Figures in millions of euros

	2019
Gross capital expenditures on finance leases	
due not later than one year	44
due later than one year and not later than two years	38
due later than two years and not later than three years	33
due later than three years and not later than four years	27
due later than four years and not later than five years	21
due later than five years	61
	224
Present value of outstanding minimum lease payments	
due not later than one year	36
due later than one year and not later than two years	32
due later than two years and not later than three years	28
due later than three years and not later than four years	24
due later than four years and not later than five years	19
due later than five years	58
	197
Unearned finance income	**27**
	77

In relation to finance leases, financial income of EUR 9 million and losses on sale of EUR 3 million were incurred in the fiscal year. There were no unguaranteed residual values.

The following receivables from finance leases were reported in the previous year:

Figures in millions of euros

	2018
Gross capital expenditures on finance leases	
due not later than one year	44
due later than one year and not later than five years	121
due later than five years	59
	224
Present value of outstanding minimum lease payments	
due not later than one year	35
due later than one year and not later than five years	103
due later than five years	55
	193
Unearned finance income	**31**

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Under operating leases, the lessor retains substantially all the risks and rewards incidental to ownership. The assets concerned are recognized in property, plant, and equipment, and the lease payments received, provided they are not disclosed as sales revenue, are recorded in other operating income.

The outstanding minimum lease payments from operating lease agreements with entities of the Bosch Group as lessors mainly stem from activities of the Building Technologies division and are due as follows in the fiscal year:

Figures in millions of euros

	2019
Due not later than one year	67
Due later than one year and not later than two years	61
Due later than two years and not later than three years	57
Due later than three years and not later than four years	55
Due later than four years and not later than five years	42
Due later than five years	133
	415

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In the fiscal year, income from operating leases amounted to EUR 90 million.

In the previous year, outstanding minimum lease payments were due as follows:

Figures in millions of euros

	2018
Due not later than one year	57
Due later than one year and not later than five years	169
Due later than five years	84
	310

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30 Related party disclosures

As shareholder, Robert Bosch Industrietreuhand KG exercises majority voting rights at Robert Bosch GmbH. In addition, Robert Bosch Industrietreuhand KG is accountable for the internal audit of the Bosch Group. The costs incurred for this of EUR 21 million (previous year: EUR 17 million) were borne by Robert Bosch GmbH.

A part of the pension obligations and funds has been outsourced to Bosch Pensionsfonds AG. Robert Bosch GmbH is the sole shareholder of Bosch Pensionsfonds AG.

Robert Bosch Stiftung GmbH, Stuttgart, is the tenant of several properties belonging to Robert Bosch GmbH, Stuttgart.

Transactions with related parties
Related parties of the Bosch Group include the joint ventures as well as the entities in which non-controlling interests are held. Transactions with these entities are presented in the following table:

Figures in millions of euros

	Goods and services sold		Goods and services purchased		Receivables		Liabilities	
	2019	2018	2019	2018	2019	2018	2019	2018
Joint ventures	12	14	3	24	7	57	1	15
Investees	79	139	274	462	34	31	81	72

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All transactions with related parties were at arm’s length.

Total remuneration of key management personnel

The key management personnel are the general partners of Robert Bosch Industrietreuhand KG and any limited partners who are concurrently members of the board of management of Robert Bosch GmbH, as well as the members of the supervisory board and the members of the board of management of Robert Bosch GmbH.

The total remuneration of key management personnel comes to EUR 53 million in fiscal year 2019 (previous year: EUR 65 million) and breaks down as follows:

Figures in millions of euros

	2019	2018
Short-term benefits	25	36
Post-employment benefits	23	19
Other long-term benefits	5	10
Termination benefits	0	0
		82

For obligations from pensions and deferred compensation, provisions totaling EUR 197 million (previous year: EUR 172 million) have been recognized. Certain exercise rights are reviewed at regular intervals, as a result of which the estimation parameters used in measuring pension provisions are adjusted prospectively. The previous year's figures have been calculated on a comparable basis.

Share-based payments are not made.

Key management personnel had been granted loans of EUR 0.3 million as of the reporting date (previous year: EUR 0.3 million). There are no provisions (loss allowances) for doubtful debts due from key management personnel. Moreover, no expenses were incurred for uncollectible or doubtful receivables.

31 Additional disclosures pursuant to Sec. 315e HGB

Remuneration of members of the board of management and supervisory board
The total remuneration of the members of the board of management (including provisions) comes to EUR 25 million in the fiscal year 2019 (previous year: EUR 40 million), and that of the former members of the board of management and their surviving dependants to EUR 17 million (previous year: EUR 15 million). The remuneration of the members of the supervisory board comes to approximately EUR 2 million. An amount of EUR 257 million (previous year: EUR 233 million) has been accrued for pension obligations to former members of the board of management and their surviving dependants.

Headcount

	Annual average 2019	Annual average 2018
EU countries	222,821	222,237
Rest of Europe	24,906	26,593
Americas	45,309	44,796
Asia, Africa, Australia	114,502	113,859
	407,538	**407,485**

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Disclosures on personnel expenses

Personnel expenses break down as follows:

Figures in millions of euros

	2019	2018
Remuneration	19,778	18,691
Social security costs	3,222	2,703
Post-employment benefit costs	824	825
	23,824	**22,219**

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Auditor's fees

The fees of the group auditor for audit and advisory services in Germany amount to:

Figures in millions of euros

	2019	2018
Fees for		
Audit services	6	7
Audit-related services	0	0
Tax advisory services	0	2
Other services	10	16

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LIST OF SHAREHOLDINGS OF THE BOSCH GROUP
as of December 31, 2019

1 Consolidated group

	Company name	Registered office	Percentage share of capital
Germany	Robert Bosch GmbH	Stuttgart	
	AS Abwicklung Dritte Produktion GmbH i.L.	Stuttgart	100.0
	AS Abwicklung und Solar-Service Deutschland GmbH i.L.	Stuttgart	100.0
	AS Abwicklung und Solar-Service GmbH i.L.	Stuttgart	100.0
	AS Guss Beteiligungsgesellschaft mbH	Stuttgart	100.0
	BD Kompressor GmbH	Lollar	100.0
	BD Kompressor Holding GmbH & Co. KG	Lollar	50.0
	Bosch Access Systems GmbH	Würselen	100.0 [1]
	Bosch Automotive Service Solutions GmbH	Pollenfeld	100.0 [1]
	Bosch Connected Devices and Solutions GmbH	Reutlingen	100.0 [1]
	Bosch Energy and Building Solutions GmbH	Ditzingen	100.0 [1]
	Bosch Engineering GmbH	Abstatt	100.0 [1]
	Bosch Healthcare Solutions GmbH	Waiblingen	100.0 [1]
	Bosch Hilfe GmbH	Stuttgart	100.0
	Bosch Industriekessel GmbH	Gunzenhausen	100.0 [1]
	Bosch KWK Systeme GmbH	Lollar	100.0 [1]
	Bosch Pensionsgesellschaft mbH	Stuttgart	100.0 [1]
	Bosch Power Tec GmbH	Stuttgart	100.0
	Bosch Rexroth AG	Stuttgart	100.0 [1, 2]
	Bosch Rexroth Guss GmbH	Lohr am Main	100.0 [1]
	Bosch Rexroth Vermögensverwaltung GmbH	Lohr am Main	100.0 [1]
	Bosch Sensortec GmbH	Kusterdingen	100.0 [1]
	Bosch Service Solutions GmbH	Stuttgart	100.0 [1]
	Bosch Service Solutions Leipzig GmbH	Leipzig	100.0 [1]
	Bosch Service Solutions Magdeburg GmbH	Magdeburg	100.0 [1]
	Bosch Sicherheitssysteme Engineering GmbH	Nuremberg	100.0 [1]
	Bosch Sicherheitssysteme GmbH	Stuttgart	100.0 [1, 2]
	Bosch Sicherheitssysteme Montage und Service GmbH	Weimar	100.0 [1]
	Bosch SoftTec GmbH	Hildesheim	100.0 [1]
	Bosch Software Innovations GmbH	Berlin	100.0 [1]
	Bosch Solar CISTech GmbH	Gerlingen	100.0
	Bosch Solar Services GmbH	Arnstadt	100.0 [1, 2]
	Bosch Solar Thin Film GmbH	Arnstadt	100.0 [1]
	Bosch Solarthermie GmbH	Wettringen	100.0 [1]
	Bosch Technology Licensing Administration GmbH	Gerlingen	100.0 [1]
	Bosch Telecom Holding GmbH	Stuttgart	100.0 [1, 2]
	Bosch Thermotechnik GmbH	Wetzlar	100.0 [1, 2]
	Bosch Wohnungsverwaltungsgesellschaft mbH & Co. KG	Stuttgart	100.0
	BSH Hausgeräte GmbH	Munich	100.0 [1, 2]

Company name	Registered office	Percentage share of capital
BSH Hausgeräte Service GmbH	Munich	100.0 [1]
BSH Hausgeräte Service Nauen GmbH	Nauen	100.0 [1]
BSH Hausgerätewerk Nauen GmbH	Nauen	100.0 [1]
BSH Vermögensverwaltungs-GmbH	Munich	100.0 [1]
Buderus Guss GmbH	Breidenbach	100.0 [1]
Buderus Immobilien GmbH	Wetzlar	96.0 [1]
COBI.Bike GmbH	Frankfurt/Main	100.0 [1]
Constructa-Neff Vertriebs-GmbH	Munich	100.0
Coup Mobility GmbH	Berlin	100.0 [1]
DAA Deutsche Auftragsagentur GmbH	Hamburg	100.0
EM-motive GmbH	Hildesheim	100.0
ETAS GmbH	Stuttgart	100.0 [1, 2]
EVI Audio GmbH	Straubing	100.0 [1]
Gaggenau Hausgeräte GmbH	Munich	100.0 [1]
GFR Gesellschaft für Regelungstechnik und Energieeinsparung mbh	Jena	100.0
GFR-Gesellschaft für Regelungstechnik und Energieeinsparung mbh	Verl	100.0
grow platform GmbH	Stuttgart	100.0 [1]
Holger Christiansen Deutschland GmbH	Wilnsdorf	100.0 [1]
ITK Engineering GmbH	Rülzheim	100.0
ITK Holding GmbH	Gerlingen	100.0
Moehwald GmbH	Homburg/Saar	100.0 [1]
Neff GmbH	Munich	100.0 [1]
Pollux Solar-Service GmbH	Arnstadt	100.0
Residential IoT Services GmbH	Munich	100.0 [1]
Robert Bosch Aftermarket Solutions GmbH	Göttingen	100.0 [1]
Robert Bosch Automotive Steering Bremen GmbH	Bremen	100.0 [1]
Robert Bosch Automotive Steering GmbH	Schwäbisch Gmünd	100.0 [1, 2]
Robert Bosch Car Multimedia GmbH	Hildesheim	100.0 [1]
Robert Bosch Elektronik GmbH	Salzgitter	100.0 [1]
Robert Bosch Elektronik Thüringen GmbH	Arnstadt	100.0 [1]
Robert Bosch Fahrzeugelektrik Eisenach GmbH	Eisenach	100.0 [1]
Robert Bosch Hausgeräte GmbH	Munich	100.0 [1]
Robert Bosch Immobilienverwaltungs GmbH & Co. KG	Stuttgart	100.0
Robert Bosch Lollar Guss GmbH	Lollar	100.0 [1]
Robert Bosch Manufacturing Solutions GmbH	Stuttgart	100.0 [1, 2]
Robert Bosch Power Tools GmbH	Leinfelden-Echterdingen	100.0 [1]
Robert Bosch Risk and Insurance Management GmbH	Stuttgart	100.0 [1]

	Company name	Registered office	Percentage share of capital
	Robert Bosch Sechste Vermögensverwaltungsgesellschaft mbH	Gerlingen	100.0 [1]
	Robert Bosch Semiconductor Manufacturing Dresden GmbH	Dresden	100.0 [1]
	Robert Bosch Siebte Vermögensverwaltungsgesellschaft mbH	Gerlingen	100.0 [1]
	Robert Bosch Smart Home GmbH	Stuttgart	100.0 [1]
	Robert Bosch Venture Capital GmbH	Gerlingen	100.0 [1]
	Robert Bosch Wohnungsgesellschaft mbH	Stuttgart	100.0
	Security and Safety Things GmbH	Munich	100.0
	SEG Hausgeräte GmbH	Munich	100.0 [1]
	sia Abrasives Deutschland GmbH	Solingen	100.0
	UC Vermögensverwaltung GmbH	Stuttgart	100.0 [1]
	WeWash GmbH	Munich	100.0 [1]
	WOGE Service- und Regiebetrieb GmbH	Stuttgart	100.0

1. These companies make use of the exemption provided for in Sec. 264 (3) HGB.
2. These companies make use of the exemption provided for in Sec. 291 (2) HGB.

	Company name	Registered office	Percentage share of capital
Europe			
Austria	Bosch Industriekessel Austria GmbH	Bischofshofen	100.0
	Bosch Rexroth GmbH	Pasching	100.0
	BSH Finance and Holding GmbH	Vienna	100.0
	BSH Hausgeräte Gesellschaft mbH	Vienna	100.0
	Robert Bosch AG	Vienna	100.0
	Robert Bosch Holding Austria GmbH	Vienna	100.0
Belgium	Bosch Rexroth N.V.	Brussels	100.0
	Bosch Thermotechnology N.V. / S.A.	Leuven-Heverlee	100.0
	BSH Home Appliances S.A.	Brussels	100.0
	Robert Bosch Produktie N.V.	Tienen	100.0
	Robert Bosch S.A.	Anderlecht (Brussels)	100.0
	sia Abrasives Belgium N.V. / S.A.	Mollem	100.0
Bulgaria	Bosch Software Innovations EOOD	Sofia	100.0
	BSH Domakinski Uredi Bulgaria EOOD	Sofia	100.0
Croatia	BSH kućanski uređaji d.o.o.	Zagreb	100.0
Czech Republic	Bosch Diesel s.r.o.	Jihlava	100.0
	Bosch Rexroth spol. s.r.o.	Brno	100.0
	Bosch Thermotechnika s.r.o.	Krnov	100.0

	Company name	Registered office	Percentage share of capital
	BSH domácí spotřebiče s.r.o.	Prague	100.0
	Robert Bosch odbytova s.r.o.	Prague	100.0
	Robert Bosch, spol. s.r.o.	České Budějovice	100.0
Denmark	Bosch Rexroth A/S	Hvidovre	100.0
	BSH Hvidevarer A/S	Ballerup	100.0
	Holger Christiansen A/S	Esbjerg	100.0
	Robert Bosch A/S	Ballerup	100.0
Finland	Bosch Rexroth Oy	Vantaa	100.0
	BSH Kodinkoneet Oy	Helsinki	100.0
	Robert Bosch Oy	Vantaa	100.0
France	Bosch Automotive Service Solutions SAS	Cergy Saint-Christophe	100.0
	Bosch Rexroth DSI S.A.S.	Vénissieux	100.0
	Bosch Rexroth S.A.S.	Vénissieux	100.0
	Bosch Security Systems France S.A.S.	Drancy	100.0
	BSH Electroménager S.A.S.	Saint-Ouen	100.0
	COUP France S.A.S.	Paris	100.0
	e.l.m. leblanc S.A.S.	Drancy	100.0
	Gaggenau Industrie S.A.S.	Lipsheim	100.0
	Holger Christiansen France S.A.S.	Olivet	100.0
	Robert Bosch (France) S.A.S.	Saint-Ouen	100.0
	Robert Bosch Automotive Steering Marignier S.A.S.	Marignier	100.0
	Robert Bosch Automotive Steering Vendôme S.A.S.	Vendôme	100.0
	sia Abrasives France S.a.r.l.	Drancy	100.0
Greece	BSH Ikiakes Syskeves A.B.E.	Athens	100.0
	Robert Bosch S.A.	Koropi (Athens)	100.0
Hungary	Automotive Steering Column Kft.	Eger	100.0
	Bosch Rexroth Kft.	Budapest	100.0
	BSH Háztartási Készülék Kereskedelmi Kft.	Budapest	100.0
	Robert Bosch Automotive Steering Kft.	Eger	100.0
	Robert Bosch Elektronika Gyártó Kft.	Hatvan	100.0
	Robert Bosch Energy and Body Systems Kft.	Miskolc	100.0
	Robert Bosch Kft.	Budapest	100.0
	Robert Bosch Power Tool Elektromos Szerszámgyártó Kft.	Miskolc	100.0
Ireland	Robert Bosch Ireland Ltd.	Dublin	100.0

	Company name	Registered office	Percentage share of capital
Italy	ARESI S.p.A.	Brembate	100.0
	Bosch Automotive Service Solutions S.r.l.	Parma	100.0
	Bosch Energy and Building Solutions Italy S.r.l.	Milan	100.0
	Bosch Rexroth Oil Control S.p.A.	Milan	100.0
	Bosch Rexroth S.p.A.	Cernusco	100.0
	Bosch Security Systems S.p.A.	Milan	100.0
	BSH Elettrodomestici S.p.A.	Milan	100.0
	Centro Studi Componenti per Veicoli S.p.A.	Modugno (Bari)	100.0
	EDiM S.p.A.	Villasanta	100.0
	Freud S.p.A.	Milan	100.0
	Holger Christiansen Italia S.r.l.	San Lazzaro di Savena	100.0
	ROBERT BOSCH S.p.A. Società Unipersonale	Milan	100.0
	Tecnologie Diesel S.p.A. Società Unipersonale	Modugno (Bari)	100.0
	VHIT S.p.A.	Offanengo	100.0
Kazakhstan	TOO BSH Home Appliances	Almaty	100.0
	TOO Robert Bosch	Almaty	100.0
Latvia	Robert Bosch SIA	Riga	100.0
Luxembourg	BSH électroménagers S.A.	Senningerberg	100.0
	Ferroknepper Buderus S.A.	Esch-sur-Alzette	100.0
Netherlands	Bosch Power Tools B.V.	Breda	100.0
	Bosch Rexroth B.V.	Boxtel	100.0
	Bosch Security Systems B.V.	Eindhoven	100.0
	Bosch Thermotechniek B.V.	Deventer	100.0
	Bosch Thermotechnology Netherlands Holding B.V.	Boxtel	100.0
	Bosch Transmission Technology B.V.	Tilburg	100.0
	BSH Huishoudapparaten B.V.	Amsterdam	100.0
	Nefit Vastgoed B.V.	Deventer	100.0
	Robert Bosch Asset Managing C.V.	Boxtel	100.0
	Robert Bosch B.V.	Boxtel	100.0
	Robert Bosch Finance Nederland B.V.	Boxtel	100.0
	Robert Bosch Holding Nederland B.V.	Boxtel	100.0
	Robert Bosch IC Financing Nederland B.V.	Boxtel	100.0
	Robert Bosch Investment Nederland B.V.	Boxtel	100.0
Norway	Bosch Rexroth AS	Ski	100.0
	BSH Husholdningsapparater A/S	Oslo	100.0
	Robert Bosch AS	Trollåsen	100.0

	Company name	Registered office	Percentage share of capital
Poland	Bosch Rexroth Sp. z o.o.	Warsaw	100.0
	BSH Sprzęt Gospodarstwa Domowego Sp. z o.o.	Warsaw	100.0
	ROBERT BOSCH Sp. z o.o.	Warsaw	100.0
	SIA Abrasives Polska Sp. z o.o.	Goleniów	100.0
Portugal	Bosch Car Multimedia Portugal, S.A.	Braga	100.0
	Bosch Security Systems, S.A.	Ovar	100.0
	Bosch Termotechnologia, S.A.	Aveiro	100.0
	BSHP Electrodomésticos, S.U., Lda.	Carnaxide	100.0
	Robert Bosch, S.A.	Lisbon	100.0
Romania	Bosch Automotive S.R.L.	Blaj	100.0
	Bosch Rexroth Sales S.R.L.	Blaj	100.0
	Bosch Service Solutions S.R.L.	Timişoara	100.0
	BSH Electrocasnice S.R.L.	Bucharest	100.0
	ROBERT BOSCH S.R.L.	Bucharest	100.0
Russian Federation	Bosch Heating Systems LLC	Engels	100.0
	Evroradiators LLC	Engels	100.0
	OOO “Construction & investments”	Khimki	100.0
	OOO Bosch Power Tools	Engels	100.0
	OOO Bosch Rexroth	Moscow	100.0
	OOO Bosch Thermotechnik	Moscow	100.0
	OOO BSH Bytowije Pribory	St. Petersburg	100.0
	OOO Robert Bosch	Moscow	100.0
	OOO Robert Bosch Saratow	Engels	100.0
	Robert Bosch Samara LLC	Chernovskiy	100.0
Serbia	BSH Kućni Aparati d.o.o. Beograd	Belgrade	100.0
	Robert Bosch DOO	Belgrade	100.0
Slovakia	BSH Drives and Pumps s.r.o.	Michalovce	100.0
	Holger Christiansen Produktion Slovakia s.r.o.	Bernolákovo	100.0
	Robert Bosch spol. s.r.o.	Bratislava	100.0
Slovenia	Bosch Rexroth d.o.o.	Škofja Loka	100.0
	BSH Hišni Aparati d.o.o.	Nazarje	100.0
Spain	Bosch Rexroth, S.L.U.	Madrid	100.0
	Bosch Service Solutions, S.A.U.	Madrid	100.0
	BOSCH SISTEMAS DE FRENADO, S.L.U.	Madrid	100.0
	BSH Electrodomésticos España, S.A.	Zaragoza	100.0

	Company name	Registered office	Percentage share of capital
	Coup Urban Mobility S.L.	Madrid	100.0
	ROBERT BOSCH ESPAÑA FÁBRICA ARANJUEZ S.A.U.	Aranjuez	100.0
	ROBERT BOSCH ESPAÑA FÁBRICA CASTELLET S.A.U.	Castellet	100.0
	ROBERT BOSCH ESPAÑA FÁBRICA MADRID S.A.U.	Madrid	100.0
	ROBERT BOSCH ESPAÑA, S.L.U.	Madrid	100.0
	sia Abrasives Espana S.A.U.	Madrid	100.0
Sweden	Bosch Rexroth AB	Stockholm	100.0
	Bosch Thermoteknik AB	Tranås	100.0
	BSH Home Appliances AB	Stockholm	100.0
	Robert Bosch AB	Kista	100.0
Switzerland	Bosch Rexroth Schweiz AG	Buttikon	100.0
	BSH Hausgeräte AG	Geroldswil	100.0
	Buderus Heiztechnik AG	Pratteln	100.0
	Robert Bosch AG	Zuchwil	100.0
	Robert Bosch Internationale Beteiligungen AG	Zuchwil	100.0
	Scintilla AG	Solothurn	100.0
	sia Abrasives Industries AG	Frauenfeld	100.0
Turkey	Bosch Fren Sistemleri Sanayi ve Ticaret A.S.	Bursa	84.5
	Bosch Rexroth Otomasyon Sanayi ve Ticaret A.S.	Bursa	100.0
	Bosch Sanayi ve Ticaret A.S.	Bursa	100.0
	Bosch Termoteknik Isitma ve Klima Sanayi Ticaret A.S.	Manisa	100.0
	BSH Ev Aletleri Sanayi ve Ticaret A.Ş.	Istanbul	100.0
Ukraine	Holger Christiansen Production Ukraine	Krakovets	100.0
	MBT Trade T.B.O.	Kiev	100.0
	TOV BSH Pobutova Technika	Kiev	100.0
	Zelmer Ukraine T.B.O.	Kiev	100.0
United Kingdom	Bosch Automotive Service Solutions Ltd.	Brixworth	100.0
	Bosch Lawn and Garden Ltd.	Stowmarket	100.0
	Bosch Rexroth Ltd.	St. Neots	100.0
	Bosch Service Solutions Ltd.	Denham	100.0
	Bosch Thermotechnology Ltd.	Worcester	100.0
	BSH Home Appliances Ltd.	Milton Keynes	100.0
	Robert Bosch Investment Ltd.	Worcester	100.0
	Robert Bosch Ltd.	Denham	100.0
	Robert Bosch UK Holdings Limited	Denham	100.0
	sia Abrafoam Ltd.	Alfreton	100.0
	sia Abrasives (G.B.) Ltd.	Greetland	100.0
	sia Abrasives Holding Ltd.	Greetland	100.0

	Company name	Registered office	Percentage share of capital
	sia Fibral Ltd.	Greetland	100.0
	Worcester Group plc	Worcester	100.0
Americas			
Argentina	Bosch Rexroth S.A.I.C.	Buenos Aires	100.0
	BSH Electrodomésticos S.A.	Buenos Aires	100.0
	Robert Bosch Argentina Industrial S.A.	Buenos Aires	100.0
Brazil	Bosch Rexroth Ltda.	Atibaia	100.0
	Bosch Soluções Integradas Brasil Ltda.	Campinas	100.0
	Bosch Telecom Ltda.	Campinas	100.0
	Bosch Termotecnologia Ltda.	São Paulo	100.0
	Robert Bosch Direçáo Automotiva Ltda.	Sorocaba	100.0
	Robert Bosch Ltda.	Campinas	100.0
Canada	Bosch Rexroth Canada Corporation	Welland, ON	100.0
	BSH Home Appliances Ltd./ Électroménagers BSH Ltée	Mississauga, ON	100.0
	Freud Canada Inc.	Mississauga, ON	100.0
	ROBERT BOSCH INC.	Mississauga, ON	100.0
Chile	Bosch Rexroth Chile S.p.A.	Santiago de Chile	100.0
	Robert Bosch S. A.	Santiago de Chile	100.0
Colombia	BSH Electrodomesticos S.A.S.	Bogotá	100.0
	Robert Bosch Ltda.	Bogotá	100.0
Costa Rica	Robert Bosch Service Solutions - Costa Rica Sociedad Anonima	Heredia	100.0
Mexico	Bosch Automotive Service Solutions, S.A. de C.V.	Mexico City	100.0
	Bosch Rexroth, S.A. de C.V.	Mexico City	100.0
	Frenados Mexicanos, S.A. de C.V.	Aguascalientes	100.0
	Robert Bosch México Sistemas Automotrices, S.A. de C.V.	San Luis Potosí	100.0
	Robert Bosch México Sistemas de Frenos, S. de R.L. de C.V.	Juárez	100.0
	Robert Bosch México Sistemas de Seguridad, S.A. de C.V.	Hermosillo	100.0
	Robert Bosch México, S.A. de C.V.	Mexico City	100.0
	Robert Bosch Sistemas Automotrices, S.A. de C.V.	Juárez	100.0
	Robert Bosch Tool de México, S.A. de C.V.	Mexicali	100.0
	Robert Bosch, S. de R.L. de C.V.	Toluca	100.0
	SPLT México, S.A. de C.V.	Mexico City	100.0

	Company name	Registered office	Percentage share of capital
Peru	BSH Electrodomésticos S.A.C.	Callao/Lima	100.0
	Robert Bosch S.A.C.	Lima	100.0
United States	Automotive Steering Column LLC	Florence, KY	100.0
	Bosch Automotive Service Solutions Inc.	Warren, MI	100.0
	Bosch Brake Components LLC	Broadview, IL	100.0
	Bosch Rexroth Corporation	Lehigh Valley, PA	100.0
	Bosch Security Systems Inc.	Burnsville, MN	100.0
	Bosch Thermotechnology Corp.	Londonderry, NH	100.0
	BSH Home Appliances Corporation	Irvine, CA	100.0
	Climatec, LLC	Phoenix, AZ	100.0
	ETAS Inc.	Ann Arbor, MI	100.0
	FHP Manufacturing Company	Fort Lauderdale, FL	57.0
	Freud America Inc.	High Point, NC	100.0
	Nimbus Holdings LLC	Wilmington, DE	100.0
	Robert Bosch Asset Management I LLC	Wilmington, DE	100.0
	Robert Bosch Asset Management I LP	Wilmington, DE	100.0
	Robert Bosch Automotive Steering LLC	Florence, KY	100.0
	Robert Bosch Battery Systems LLC	Orion, MI	100.0
	Robert Bosch Finance LLC	Broadview, IL	100.0
	ROBERT BOSCH FUEL SYSTEMS LLC	Kentwood, MI	100.0
	Robert Bosch LLC	Broadview, IL	100.0
	Robert Bosch North America Corporation	Broadview, IL	100.0
	Robert Bosch Start-up Platform North America LLC	Wilmington, DE	100.0
	Robert Bosch Tool Corporation	Mt. Prospect, IL	100.0
	sia Abrasives, Inc. USA	Charlotte, NC	100.0
	Splitting Fares Inc.	Detroit, MI	100.0
Asia			
China	Bosch (China) Investment Ltd.	Shanghai	100.0
	Bosch (Donghai) Automotive Test & Technology Center Co., Ltd.	Donghai	100.0
	Bosch (Hulunbeier) Automotive Test and Technology Centre Co., Ltd.	Yakeshi	100.0
	Bosch (Ningbo) e-scooter Motor Co., Ltd.	Ningbo	100.0
	Bosch (Shanghai) Investment Consulting Co., Ltd.	Shanghai	100.0
	Bosch (Shanghai) Security Systems Ltd.	Shanghai	100.0
	Bosch (Shanghai) Venture Capital Investment Co., Ltd.	Shanghai	100.0
	Bosch (Zhuhai) Security Systems Co., Ltd.	Zhuhai	100.0
	Bosch Automotive Aftermarket (China) Co., Ltd.	Nanjing	100.0
	Bosch Automotive Components (Changchun) Co., Ltd.	Changchun	55.0
	Bosch Automotive Diesel Systems Co., Ltd.	Wuxi	66.0

Company name	Registered office	Percentage share of capital
Bosch Automotive Products (Changsha) Co., Ltd.	Changsha	100.0
Bosch Automotive Products (Chengdu) Co., Ltd.	Chengdu	100.0
Bosch Automotive Products (Suzhou) Co., Ltd.	Suzhou	100.0
Bosch Automotive Products (Wuhu) Co., Ltd.	Wuhu	100.0
Bosch Automotive Service Solutions (Suzhou) Co., Ltd.	Suzhou	100.0
Bosch Automotive Steering (Jinan) Co., Ltd.	Jinan	100.0
Bosch Automotive Steering Jincheng (Nanjing) Co., Ltd.	Nanjing	70.0
Bosch Automotive Steering Management (Shanghai) Co., Ltd.	Shanghai	100.0
Bosch Automotive Systems (Wuxi) Co., Ltd.	Wuxi	100.0
Bosch Automotive Technical Service (Beijing) Co., Ltd.	Beijing	100.0
Bosch Electronics Trading (Suzhou) Co., Ltd.	Suzhou	100.0
Bosch HUAYU Steering Systems (Nanjing) Co., Ltd.	Nanjing	100.0
Bosch HUAYU Steering Systems (Wuhan) Co., Ltd.	Wuhan	100.0
Bosch HUAYU Steering Systems (Yantai) Co., Ltd.	Yantai	100.0
Bosch HUAYU Steering Systems Co., Ltd.	Shanghai	51.0
Bosch Laser Equipment (Dongguan) Limited	Dongguan	100.0
Bosch Power Tools (Chengdu) Co., Ltd.	Chengdu	100.0
Bosch Power Tools (China) Ltd.	Hangzhou	100.0
Bosch Rexroth (Beijing) Hydraulic Co., Ltd.	Beijing	100.0
Bosch Rexroth (Changzhou) Co., Ltd.	Changzhou	100.0
Bosch Rexroth (China) Ltd.	Hong Kong	100.0
Bosch Rexroth (Xi'an) Electric Drives and Controls Co., Ltd.	Xi'an	100.0
Bosch Security Systems Ltd.	Hong Kong	100.0
Bosch Thermotechnology (Beijing) Co., Ltd.	Beijing	100.0
Bosch Thermotechnology (Shandong) Co., Ltd.	Zibo	100.0
Bosch Thermotechnology (Shanghai) Co., Ltd.	Shanghai	100.0
Bosch Thermotechnology (Wuhan) Co., Ltd.	Wuhan	100.0
Bosch Trading (Shanghai) Co., Ltd.	Shanghai	100.0
BSH Electrical Appliances (Jiangsu) Co., Ltd.	Nanjing	100.0
BSH Home Appliances (China) Co., Ltd.	Nanjing	100.0
BSH Home Appliances Co., Ltd.	Chuzhou	100.0
BSH Home Appliances Holding (China) Co., Ltd.	Nanjing	100.0
BSH Home Appliances Ltd.	Hong Kong	100.0
BSH Home Appliances Service Jiangsu Co., Ltd.	Nanjing	100.0
BSW Household Appliances Co., Ltd.	Wuxi	100.0
ETAS Automotive Technology (Shanghai) Co., Ltd.	Shanghai	100.0
Guangzhou sia Abrasives Company Ltd.	Guangzhou	100.0
Robert Bosch Company Ltd.	Hong Kong	100.0
Shanghai Bosch Rexroth Hydraulics & Automation Ltd.	Shanghai	100.0
Taixiang Vehicle Replace Parts (Shenzhen) Co., Ltd.	Shenzhen	100.0
United Automotive Electronic Systems (Chongqing) Co., Ltd.	Chongqing	65.0
United Automotive Electronic Systems Co., Ltd.	Shanghai	51.0

	Company name	Registered office	Percentage share of capital
India	Bosch Automotive Electronics India Private Ltd.	Bengaluru	100.0
	Bosch Chassis Systems India Private Ltd.	Pune	100.0
	Bosch Electrical Drives India Private Ltd.	Chennai	90.8
	Bosch Ltd.	Bengaluru	70.5
	Bosch Rexroth (India) Private Limited	Ahmedabad	100.0
	BSH Home Appliances Private Limited	Mumbai	100.0
	BSH Household Appliances Manufacturing Private Limited	Mumbai	100.0
	Robert Bosch Automotive Steering Private Limited	Pune	100.0
	Robert Bosch Engineering and Business Solutions Private Ltd.	Bengaluru	100.0
Indonesia	PT BSH Home Appliances	Jakarta	100.0
	PT Robert Bosch	Jakarta	100.0
Israel	BSH Home Appliances Ltd.	Herzlia	100.0
Japan	Bosch Corporation	Tokyo	100.0
	Bosch Engineering K.K.	Tokyo	100.0
	Bosch Rexroth Corporation	Tsuchiura-shi	99.9
	Bosch Security Systems Ltd.	Tokyo	100.0
	ETAS K.K.	Yokohama	100.0
	FA Niigata Co., Ltd.	Niigata	100.0
	Fuji Aitac Co., Ltd.	Gunma	100.0
	Gunma Seiki Co., Ltd.	Gunma	100.0
	Nippon Injector Corporation	Odawara	50.0
Korea	Bosch Electrical Drives Co., Ltd.	Sejong	100.0
	Bosch Rexroth Korea Ltd.	Busan	100.0
	Robert Bosch Korea Limited Company	Daejeon	100.0
Malaysia	Bosch Power Tools Engineering Sdn. Bhd.	Penang	100.0
	Bosch Rexroth Sdn. Bhd.	Shah Alam	100.0
	BSH Home Appliances Sdn. Bhd.	Kuala Lumpur	100.0
	ROBERT BOSCH (MALAYSIA) SDN. BHD.	Penang	100.0
	Robert Bosch Automotive Steering Sdn. Bhd.	Penang	100.0
	ROBERT BOSCH POWER TOOLS SDN. BHD.	Penang	100.0
	Robert Bosch Sdn. Bhd.	Kuala Lumpur	100.0
Philippines	Bosch Service Solutions, Inc.	Manila	100.0
	Robert Bosch Inc.	Manila	100.0
Saudi Arabia	BSH Home Appliances Saudi Arabia LLC	Jeddah	51.0

	Company name	Registered office	Percentage share of capital
Singapore	Bosch Rexroth Pte. Ltd.	Singapore	100.0
	BSH Home Appliances Pte. Ltd.	Singapore	100.0
	Robert Bosch (South East Asia) Pte. Ltd.	Singapore	100.0
	Robert Bosch Security Solutions Pte.	Singapore	100.0
Taiwan	Bosch Rexroth Co. Ltd.	Taipei	100.0
	BSH Home Appliances Private Limited	Taipei	100.0
	Robert Bosch Taiwan Co., Ltd.	Taipei	100.0
	Unipoint Electric MFG Co., Ltd.	Taipei	100.0
Thailand	Bosch Automotive Thailand Co. Ltd.	Rayong	87.9
	BSH Home Appliances Ltd.	Bangkok	100.0
	Robert Bosch Ltd.	Bangkok	100.0
	Robert Bosch Automotive Technologies (Thailand) Co., Ltd.	Rayong	100.0
United Arab Emirates	BSH Home Appliances FZE	Dubai	100.0
	BSH Home Appliances General Trading LLC	Dubai	100.0
	Robert Bosch Middle East FZE	Dubai	100.0
Vietnam	Bosch Vietnam Co., Ltd.	Dong Nai Province	100.0
	Robert Bosch Engineering and Business Solutions Vietnam Co. Ltd.	Ho Chi Minh City	100.0
Rest of World			
Australia	Bosch Automotive Service Solutions Pty. Ltd.	Clayton	100.0
	Bosch Rexroth Pty. Ltd.	Kings Park	100.0
	Bosch Security Systems Pty. Ltd.	Sydney	100.0
	BSH Home Appliances Pty. Ltd.	Heatherton	100.0
	Robert Bosch (Australia) Pty. Ltd.	Clayton	100.0
	sia Abrasives Australia Pty. Ltd.	Rowville	100.0
Botswana	Hytec Hydraulics Botswana (Pty) Ltd.	Gaborone	100.0
Egypt	BSH Home Appliances LLC	New Cairo	100.0
	BSH Home Appliances Holding LLC	New Cairo	100.0
Ghana	Bosch Rexroth Ghana Ltd.	Accra	100.0
Kenya	Bosch Rexroth Kenya Ltd.	Nairobi	100.0
Morocco	BSH Electroménagers (SA)	Casablanca	100.0
	Robert Bosch Morocco Sarl	Casablanca	100.0

	Company name	Registered office	Percentage share of capital
Mozambique	Hytec Hydraulics Mocambique Lda.	Maputo	100.0
	Hytec Services Mozambique Lda.	Maputo	100.0
Namibia	Hytec Namibia Pty. Ltd.	Walvis Bay	100.0
New Zealand	BSH Home Appliances Ltd.	Auckland	100.0
South Africa	Bosch Rexroth South Africa (RF) (Pty) Ltd.	Johannesburg	100.0
	BSH Home Appliances (Pty.) Ltd.	Johannesburg	100.0
	Corgam Property Investments Pty. Ltd.	Kempton Park	100.0
	Hydraulic and Automation Warehouse Pty. Ltd.	Kempton Park	100.0
	HYSA Pty. Ltd.	Kempton Park	100.0
	Hytec Engineering Pty. Ltd.	Kempton Park	100.0
	Hytec Fluid Technology Pty. Ltd.	Kempton Park	100.0
	Hytec Services Africa Pty. Ltd.	Kempton Park	100.0
	Hytec South Africa (RF) (Pty) Ltd.	Kempton Park	75.0
	Robert Bosch (Pty.) Ltd.	Brits	100.0
	Tectra Automation Pty. Ltd.	Kempton Park	100.0
Zambia	Hytec Zambia Ltd.	Kitwe	100.0

2 Investments measured using the equity method

	Company name	Registered office	Percentage share of capital
Korea	KB Wiper Systems Co., Ltd.	Daegu	50.0

3 Non-consolidated and other investments

	Company name	Registered office	Percentage share of capital
Germany	ads-tec Energy GmbH	Nürtingen	39.0
	AIG Planungs- und Ingenieurgesellschaft mbH	Stuttgart	100.0
	AJNS New Media GmbH	Berlin	64.9
	Alltrucks GmbH & Co. KG	Munich	33.3
	BD Kompressor Management GmbH	Lollar	100.0
	Bosch Management Support GmbH	Leonberg	100.0
	Bosch Pensionsfonds AG	Stuttgart	100.0
	BS Systems GmbH & Co. KG	Zusmarshausen	50.0
	BSH Altersfürsorge GmbH	Munich	100.0

	Company name	Registered office	Percentage share of capital
	BSH Digital Ventures GmbH	Munich	100.0
	Circular Economy Solutions GmbH	Göttingen	100.0
	Drivelog GmbH	Berlin	100.0
	ECP Energiecontracting GmbH	Heidelberg	81.0
	Energiespeicher Nord GmbH & Co. KG	Braderup	45.0
	Energiespeicher Nord Verwaltungs GmbH	Braderup	45.0
	ESCRYPT GmbH	Bochum	100.0
	ETAS NI Systems GmbH & Co. KG	Stuttgart	50.0
	European Center for Information and Communication Technologies – EICT GmbH	Berlin	20.0
	for you Insurance Services GmbH	Stuttgart	100.0
	GFI Gesellschaft für Infrastrukturdienste mbH	Reutlingen	100.0
	Home Connect GmbH	Munich	100.0
	Knorr-Bremse Systeme für Nutzfahrzeuge GmbH	Munich	20.0
	Koller + Schwemmer GmbH	Nuremberg	100.0
	Kraftwerksbatterie Heilbronn GmbH	Stuttgart	50.0
	Lithium Energy and Power Management GmbH	Stuttgart	100.0
	Mobility Media GmbH	Berlin	100.0
	mozaiq operations GmbH i.L.	Munich	38.6
	Prüfzentrum Boxberg GmbH	Boxberg	100.0
	Reflekt GmbH	Munich	50.0
	Robert Bosch Battery Solutions GmbH	Eisenach	100.0
	Robert Bosch Immobilien GmbH	Stuttgart	100.0
	Robert Bosch Technical and Business Solutions GmbH	Stuttgart	100.0
	SAPCORDA SERVICES GmbH	Berlin	28.5
	Service- und Betriebsgesellschaft Heidehof mbH	Stuttgart	100.0
	SupplyOn AG	Hallbergmoos	42.1
Europe			
Austria	Bosch General Aviation Technology GmbH	Vienna	100.0
	ITK Engineering GmbH	Premstätten	100.0
	RobArt GmbH	Linz	24.8
	ZENO Track GmbH	Vienna	100.0
Belarus	Robert Bosch OOO	Minsk	100.0
Bulgaria	Robert Bosch EOOD	Sofia	100.0
Croatia	Robert Bosch d.o.o.	Zagreb	100.0
Estonia	Robert Bosch OÜ	Tallinn	100.0
France	ETAS S.A.S.	Saint-Ouen	100.0

	Company name	Registered office	Percentage share of capital
Georgia	Robert Bosch Ltd.	Tiflis	100.0
Greece	Bosch Rexroth S.A.	Athens	100.0
Hungary	Bosch Electronic Service Kft.	Kecskemét	100.0
Italy	BARI SERVIZI INDUSTRIALI Società consortile a r.l.	Modugno	50.0
	Dana Rexroth Transmission Systems S.r.l.	Arco	50.0
	DECA S.r.l.	Lugo	100.0
	Oleodinamica Gambini S.r.l.	Modena	20.0
Lithuania	UAB Robert Bosch	Vilnius	100.0
Netherlands	Digicontrol Benelux B.V.	Apeldoorn	60.0
	Intrinsic ID B.V.	Eindhoven	28.2
	Tradeplace B.V.	Amsterdam	20.0
Poland	Loos Centrum Sp.z o.o.	Warsaw	26.0
Romania	Bosch Servicii Termotehnica SRL	Bucharest	100.0
	BSH Electrocasnice Manufacturing S.R.L.	Bucharest	100.0
Slovenia	BSH I.D. Invalidska družba d.o.o.	Nazarje	100.0
	Robert Bosch d.o.o.	Ljubljana	100.0
Spain	Bosch Automotive Service Solutions S.A.U.	Madrid	100.0
	ITK Systems Engineering, S.L.U.	Barcelona	100.0
	Noustique Perfumes S.L.	Barcelona	100.0
Switzerland	Bosch Automotive Service Solutions AG	Horw	100.0
Ukraine	Robert Bosch Ltd.	Kiev	100.0
United Kingdom	Bosch Automotive Training Limited	Motherwell	100.0
	BOXT Limited	Leeds	45.0
	ETAS Ltd.	York	100.0
	LAGTA Group Training Limited	Motherwell	100.0
Americas			
Brazil	Bosch Management Support Ltda.	Campinas	99.9
	Metapar Usinagem Ltda.	Curitiba-Paraná	100.0
	Robert Bosch Centro de Comunicação Limitada	Campinas	100.0

	Company name	Registered office	Percentage share of capital
	sia Abrasivos Industriais Ltda.	São José dos Pinhais	100.0
Canada	ETAS Embedded Systems Canada Inc.	Kitchener, ON	100.0
Colombia	Robert Bosch Caribe S.A.S.	Bogotá	100.0
Ecuador	Robert Bosch Sociedad Anónima – Ecuabosch	Guayaquil	100.0
Mexico	Bosch Management Services México, S.C.	Mexico City	100.0
Panama	Robert Bosch Panama S.A.	Panama City	100.0
	Robert Bosch Panama Colón, S.A.	Colón	100.0
Paraguay	Robert Bosch Sociedad Anonima	Asunción	100.0
Peru	Bosch Rexroth S.A.C.	Lima	100.0
United States	Bosch Aviation Technology LLC	Novi, MI	100.0
	Bosch Management Services Corporation	Wilmington, DE	100.0
	Bosch Solar Energy Corp.	Detroit, MI	100.0
	Chefling, Inc.	Sunnyvale, CA	33.3
	Foldimate Inc.	Delaware	39.6
	ITK Engineering, LLC	Howell, MI	100.0
	North America Fuel Systems Remanufacturing LLC	Kentwood, MI	50.0
	RoboToolz Inc.	Mountain View, CA	100.0
	Shop-Ware Inc.	San Francisco, CA	28.0
	Versatile Natures, Inc.	Wilmington, DE	22.7
Uruguay	Robert Bosch Uruguay S.A.	Montevideo	100.0
Venezuela	Bosch Rexroth S.A.	Caracas	100.0
	Inversiones 421.10 (Venezuela Holding)	Caracas	100.0
	Robert Bosch S.A.	Caracas	100.0
	Skil Venezolana SRL	Caracas	100.0
Asia			
Bangladesh	Robert Bosch (Bangladesh) Ltd.	Dhaka	100.0
Cambodia	Robert Bosch (Cambodia) Co., Ltd.	Phnom Penh	100.0

	Company name	Registered office	Percentage share of capital
China	Bosch (Shanghai) Smart Life Technology Ltd.	Shanghai	100.0
	Freud International Trading (Shanghai) Co., Ltd.	Shanghai	100.0
	Guangdong Vanbo Electric Co., Ltd.	Foshan	50.0
	HEFEI M&B Air Conditioning Equipment Co., Ltd.	Hefei	40.0
India	Automobility Services and Solutions Private Limited	Bengaluru	100.0
	ETAS Automotive India Private Ltd.	Bengaluru	100.0
	MIVIN Engineering Technologies Private Ltd.	Bengaluru	100.0
	Newtech Filter India Private Limited	Nalagarh	100.0
	Prebo Automotive Pte. Ltd.	Pune	40.0
	Precision Seals Manufacturing Ltd.	Chakan	100.0
	Simyog Technology Pvt. Ltd.	Bengaluru	24.7
	ZF Steering Gear (India) Ltd.	Pune	26.0
Indonesia	P.T. Bosch Rexroth	Jakarta	100.0
	P.T. Robert Bosch Automotive	Jakarta	100.0
Iran	Bosch Tejarat Pars	Tehran	100.0
Israel	Allegro Artificial Intelligence Ltd.	Ramat Gan	20.9
	Robert Bosch Technologies Israel Ltd.	Tel Aviv	100.0
	Utilight Ltd.	Yavne	21.5
Japan	Advanced Driver Information Technology Corporation	Kariya-shi	50.0
	Bosch Engineering Solutions Ltd.	Tokyo	100.0
	Bosch Service Solutions Corporation	Siki	100.0
	ITK Engineering Japan, Inc.	Tokyo	100.0
	Kanto Seiatsu Kogyo Co., Ltd.	Honjo	92.9
	Knorr-Bremse Commercial Vehicle Systems Japan, Ltd.	Tokyo	20.0
Korea	ETAS Korea Co., Ltd.	Seoul	100.0
Laos	Robert Bosch (Lao) Sole Co., Ltd.	Vientiane	100.0
Malaysia	Pacific BBA (Malaysia) Sdn. Bhd.	Shah Alam	100.0
	Robert Bosch (Penang) Sdn. Bhd.	Penang	100.0
Saudi Arabia	Robert Bosch Saudi Arabia Limited Liability Company	Riad	100.0
Singapore	Surelock Pte. Ltd.	Singapore	20.0
	WhatsEGG Pte. Ltd.	Singapore	20.0
	Zimplistic Private Limited	Singapore	21.2

	Company name	Registered office	Percentage share of capital
Sri Lanka	Robert Bosch Lanka (Pvt.) Ltd.	Colombo	100.0
Thailand	FMP Distribution Ltd.	Rayong	50.1
	FMP Group (Thailand) Ltd.	Rayong	50.7
	Pacific BBA (Thailand) Ltd.	Bangkok	100.0
Rest of World			
Angola	Robert Bosch, Limitada	Luanda	100.0
Australia	Autocrew Australia Pty. Ltd.	Lawnton	50.0
	FMP Group (Australia) Pty. Ltd.	Ballarat	49.0
	Pacifica Group Pty. Ltd.	Melbourne	100.0
	The Yield Technology Solution Pty. Ltd.	Hobart	28.7
Egypt	RBEG LLC	Cairo	100.0
	Robert Bosch Holding-Egypt LLC	Cairo	100.0
	Robert Bosch Ltd.	Cairo	100.0
Ghana	Robert Bosch Ghana Ltd.	Accra	100.0
Kenya	Robert Bosch East Africa Ltd.	Nairobi	100.0
Morocco	Bosch Rexroth Morocco S.A.R.L.	Casablanca	100.0
New Zealand	Bosch Rexroth Ltd.	Auckland	100.0
	Robert Bosch Ltd.	Auckland	100.0
Nigeria	Robert Bosch Limited	Lagos	100.0
South Africa	Hägglunds Drives South Africa (Pty.) Ltd.	Fourways	100.0
Tunisia	Robert Bosch Tunisie SARL	Tunis	100.0

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Stuttgart, March 11, 2020

Robert Bosch GmbH
The board of management

AUDITOR'S REPORT

Independent Auditor's Report
To Robert Bosch Gesellschaft mit beschränkter Haftung, Stuttgart

Audit Opinions

We have audited the consolidated financial statements of Robert Bosch Gesellschaft mit beschränkter Haftung, Stuttgart, and its subsidiaries (the Group), which comprise the consolidated statement of financial position as at 31 December 2019, and the consolidated statement of comprehensive income, consolidated statement of profit or loss, consolidated statement of changes in equity and consolidated statement of cash flows for the financial year from 1 January 2019 to 31 December 2019, and notes to the consolidated financial statements, including a summary of significant accounting policies. In addition, we have audited the group management report of Robert Bosch Gesellschaft mit beschränkter Haftung, Stuttgart, for the financial year from 1 January 2019 to 31 December 2019. In accordance with the German legal requirements, we have not audited the content of the statement on corporate governance pursuant to § [Article] 289f Abs. [paragraph] 4 HGB [Handelsgesetzbuch: German Commercial Code] (disclosures regarding women's quota).

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying consolidated financial statements comply, in all material respects, with the IFRSs as adopted by the EU, and the additional requirements of German commercial law pursuant to § [Article] 315e Abs. [paragraph] 1 HGB [Handelsgesetzbuch: German Commercial Code] and, in compliance with these requirements, give a true and fair view of the assets, liabilities, and financial position of the Group as at 31 December 2019, and of its financial performance for the financial year from 1 January 2019 to 31 December 2019, 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. Our audit opinion on the group management report does not cover the content of the statement on corporate governance referred to above.

Pursuant to § 322 Abs. 3 Satz [sentence] 1 HGB, we declare that our audit has not led to any reservations relating to the legal compliance of the consolidated financial statements and of the group management report.

Basis for the Audit Opinions

We conducted our audit of the consolidated financial statements and of the group management report in accordance with § 317 HGB and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the "Auditor's Responsibilities for the Audit of the Consolidated Financial Statements and of the Group Management Report" section of our auditor's report. We are independent of the group entities in accordance with the requirements of German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our 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 group statement on corporate governance pursuant to § [Article] 289f Abs. [paragraph] 4 HGB [Handelsgesetzbuch: German Commercial Code] (disclosures regarding women's quota).

The other information comprises further the remaining parts of 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 IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to § 315e Abs. 1 HGB and that the consolidated financial statements, in compliance with these requirements, give a true and fair view of the assets, liabilities, financial position, and financial performance of the Group. In addition the executive directors are responsible for such internal control as they have determined necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the executive directors are responsible for assessing the Group's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting unless there is an intention to liquidate the Group or to cease operations, or there is no realistic alternative but to do so.

Furthermore, the executive directors are responsible for the preparation of the group management report that, as a whole, provides an appropriate view of the Group's position and is, in all material respects, consistent with the consolidated financial statements, complies with German legal requirements, and appropriately presents the opportunities and risks of future development. In addition, the executive directors are responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of a group management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient appropriate evidence for the assertions in the group management report.

The supervisory board is responsible for overseeing the Group's financial reporting process for the preparation of the consolidated financial statements and of the group management report.

Auditor’s Responsibilities for the Audit of the Consolidated Financial Statements and of the Group Management Report

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the group management report as a whole provides an appropriate view of the Group’s position and, in all material respects, is consistent with the consolidated financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor’s report that includes our 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 IFRSs as adopted by the EU and the additional requirements of German commercial law pursuant to § 315e Abs. 1 HGB.

- 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 11, 2020

PricewaterhouseCoopers GmbH
Wirtschaftsprüfungsgesellschaft

Petra Justenhoven
Wirtschaftsprüferin
(German Public Auditor)

Marcus Nickel
Wirtschaftsprüfer
(German Public Auditor)

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GROUP MANAGEMENT REPORT

CONSOLIDATED FINANCIAL STATEMENTS

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The above brochure can be ordered at:
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For an online version of the annual report, go to:
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TEN-YEAR SUMMARY OF THE BOSCH GROUP

Figures in millions of euros

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Sales revenue	**47,259**	**51,494**	**52,464**	**46,068**	**48,951**	**70,607**	**73,129**	**78,066**	**78,465**	**77,721**
of which generated outside Germany (as a percentage)	77	77	77	77	78	80	80	80	79	80
Research and development cost[1]	3,810	4,190	4,787	4,543	4,959	6,378	6,954	7,264	5,963	6,079
as a percentage of sales revenue	8.1	8.1	9.1	9.9	10.1	9.0	9.5	9.3	7.6	7.8
Capital expenditure	2,379	3,226	3,151	2,539	2,585	4,058	4,252	4,345	4,946	4,989
of which in Germany	1,023	1,161	1,115	913	1,098	1,394	1,580	1,546	1,757	1,718
of which outside Germany	1,356	2,065	2,036	1,626	1,487	2,664	2,672	2,799	3,189	3,271
as a percentage of sales revenue	5.0	6.3	6.0	5.5	5.3	5.7	5.8	5.6	6.3	6.4
as a percentage of depreciation	100	142	107	126	138	146	141	140	159	146
Depreciation of property, plant, and equipment	2,373	2,265	2,948	2,008	1,868	2,788	3,022	3,095	3,103	3,421
Annual average number of associates (thousands)	276	295	306	280	286	369	384	403	407	408
of which in Germany	112	117	119	108	105	131	133	137	138	136
of which outside Germany	164	178	187	172	181	238	251	266	269	272
as of 12/31 of the year	284	303	306	281	290	375	389	402	410	398
Personnel expenses	14,132	14,719	15,663	14,907	15,325	20,369	21,315	22,266	22,219	23,824
Total assets	**52,683**	**54,616**	**56,326**	**55,725**	**61,924**	**77,266**	**81,875**	**81,870**	**83,654**	**89,030**
Equity	26,243	26,917	26,884	27,686	29,541	34,424	36,084	37,552	39,176	41,079
as a percentage of total assets	50	49	48	50	48	45	44	46	47	46
Cash flow	5,460	4,959	4,538	3,956	4,866	6,835	6,565	8,367	7,026	6,971
as a percentage of sales revenue	11.6	9.6	8.6	8.6	9.9	9.7	9.0	10.7	9.0	9.0
Profit after tax	2,489	1,820	2,342	1,251	2,637	3,537	2,374	3,274	3,574	2,060
Unappropriated earnings	82	88	88	88	102	142	138	241	242	119

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1. Up to 2017, including development work charged directly to customers

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BOSCH
Invented for life