



# 2019 spotlights















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# Sustainability at Bosch

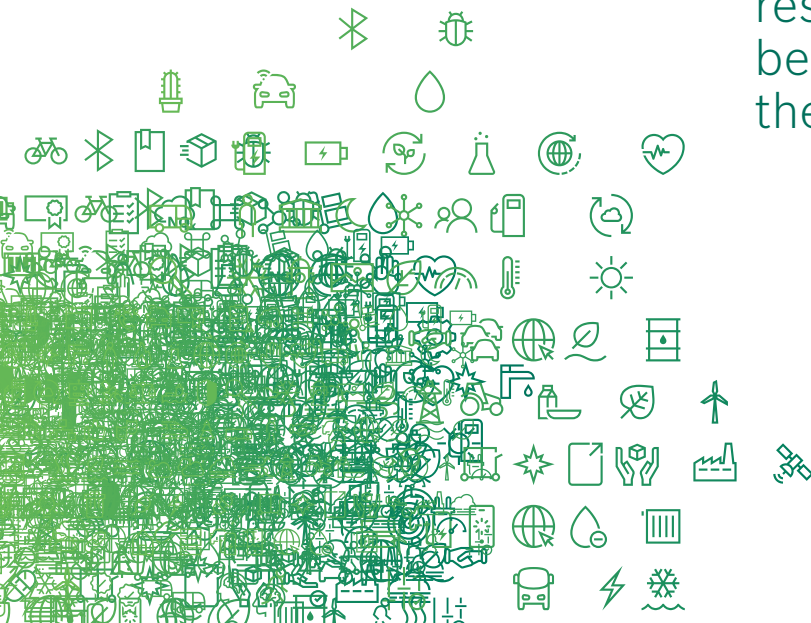
We are motivated by the desire to develop products that are “Invented for life,” that fascinate, that improve quality of life, and that help conserve natural resources. For us, that means thinking ahead, focusing firmly on the future of generations to come, and consistently pursuing sustainability as a company.

“We act prudently and responsibly for the benefit of society and the environment.” This claim anchors the values of sustainability and responsibility in Bosch’s mission statement. Especially in times of fundamental change, it is important to take responsibility for people, the environment, and society. That is why we have also committed to the United Nations’ Sustainable Development Goals (SDGs), which extend into 2030 and are intended to promote sustainable development worldwide. We support these goals with our products and services by offering solutions to social challenges and finding answers to environmental and social questions.

## Our commitment

Based on our broad understanding of sustainability at Bosch, our commitment comprises environmental, economic, and social dimensions. As a company with broad-based, global operations, we face a large number of highly diverse expectations on the part of our stakeholders – from business partners and associates through to policymakers and nongovernmental organizations. These translate into a wide range of sustainability requirements in different fields that we analyze and for which we set ourselves targets and develop forward-looking approaches for the entire value chain.

We act prudently and responsibly for the benefit of society and the environment.





## Sustainability along the value chain

### Purchasing



We accept our responsibility and pursue sustainability at all stages of the product life cycle. Starting with purchasing: we work together closely with our **suppliers** and have defined clear requirements. These cover **climate and environmental protection, resource conservation, fair working conditions** and competitive practices, and respecting **human rights**.

### Production and associates



On the basis of life cycle analyses, we endeavor to make our products eco-friendly. At the same time, we seek to reduce our own **consumption of energy and resources** and have, for that purpose, established **environmental management systems** at our locations. To continuously improve **occupational health and safety and the working conditions** of our associates at our production facilities as well as in our administrative functions worldwide, we maintain extensive occupational **health and safety management**. And, as we are well aware of how important different perspectives, attitudes, and personal backgrounds are for a successful corporate culture, we promote **diversity** and equal opportunities.

### Customers and society

One of our strengths is guaranteeing our customers the highest **quality and safe products**. Our primary intent in the long term is to thus move to a way of living and doing business that conserves resources and has a positive impact on society. At the same time, we see ourselves as an active member of society and get involved through a wide range of activities. Public-benefit institutions in Brazil, China, India, Mexico, and the United States that seek to reduce poverty and give people access to education in the respective communities are one of the means by which we put our **social responsibility** into practice. Bosch donates far in excess of 20 million euros to charitable causes around the world.





# Our target vision: new dimensions

In line with its longstanding commitment but with a greater focus on social challenges, Bosch has set itself clear sustainability targets. Our “New Dimensions – Sustainability 2025” target vision focuses on six megatrends.

In light of the complex requirements and breadth of relevant sustainability topics worldwide, we asked ourselves how we as a company can best contribute to sustainable development. With this in mind, our sustainability experts analyzed global megatrends, conducted an industry-wide benchmark survey, and engaged in in-depth dialogue with stakeholders.

## Material issues

The issues of the “New Dimensions” target vision have been derived from the 2018 materiality analysis and are the cornerstones of our sustainability management: climate, energy, water, urbanization, globalization, and health. With respect to all these issues, we focus on those aspects where we can contribute the most in terms of protecting the environment and people.



“We want to take action wherever it will be most beneficial for the environment and society.”

Torsten Kallweit, Head of EHS and Sustainability at Bosch



Find out more about our “New Dimensions – Sustainability 2025” target vision.





## Climate

### Aspect 1: Scope 1 and 2 CO<sub>2</sub> emissions

Bosch is committed to the Paris Agreement's target. From 2020, the company will be **climate neutral** in terms of the volume of energy it generates and purchases (scope 1 and 2).

### Aspect 2: Scope 3 CO<sub>2</sub> emissions

CO<sub>2</sub> emissions in the scope 3 categories of "purchased goods," "logistics," and "use of products sold" are to be **reduced by 15 percent** by 2030.

You can find more information about climate on **pages 6 to 9**.

## Energy

### Aspect 1: Energy efficiency

We want to **save 1,700 gigawatt-hours** by 2030 using energy-efficiency measures. To achieve this, we will invest a total of more than one billion euros.

### Aspect 2: Renewable energies

We plan to increase the volume of power we generate from renewable sources from 55 to **400 gigawatt-hours** and considerably extend the **green electricity** we buy in from **new plants** by 2030.

You can find more information about energy on **pages 10 to 13**.

## Health

### Aspect 1: Occupational health and safety

By 2020, the accident rate should be no more than **1.7 accidents** per one million hours worked.

### Aspect 2: Substances of concern

To efficiently manage prohibitions and restrictions on materials, Bosch continuously updates its **IT-based system** Material Data Management for Compliance and Sustainability.

You can find more information about health on **pages 26 to 29**.



## Water

### Aspect 1: Water scarcity

Bosch wants to **systematically reduce by 25 percent** its absolute water withdrawal at 61 locations in regions with water scarcity by 2025.

### Aspect 2: Water quality

Bosch has set itself the goal of continuously improving the **quality of water discharges**.

You can find more information about water on **pages 14 to 17**.

## Globalization

### Aspect 1: Responsibility

With around 398,200 associates worldwide, Bosch takes responsibility **for sustainability** and creates **transparency** within the meaning of the standards issued by the Global Reporting Initiative.

### Aspect 2: Supply chain

The aim is to more clearly identify the ecological and social risks in the supply network and to refine current measures on that basis. In 2020, the focus will be placed on **human rights** in particular.

You can find more information about globalization on **pages 22 to 25**.

## Urbanization

### Aspect 1: Product life cycle

In order to **strengthen the circular economy**, Bosch plans to launch a strategic project in 2020 that combines the operating units' efforts and provides an overarching framework.

### Aspect 2: Resources and waste

With regard to resources, Bosch focuses on waste avoidance (**Zero Waste to Landfill**) and reducing hazardous waste.

You can find more information about urbanization on **pages 18 to 21**.



# Advancing with foresight: climate action beyond company boundaries

Climate change requires urgent action. We are taking responsibility at Bosch, and making our over 400 locations carbon neutral in 2020. But that's not all: we want to shape climate action and also take a close look at the carbon footprint of our products, purchased goods, and logistics processes.



Industrial companies such as Bosch have a big part to play in efforts to achieve a largely climate-neutral world. According to the International Energy Agency, industry accounts for around 19 percent of global CO<sub>2</sub> emissions. On top of our clear objective to make our more than 400 locations climate neutral as of 2020, we are going a step further: we have additionally set ourselves an ambitious target for lowering our indirect emissions in order to reduce our carbon footprint – even beyond company boundaries.

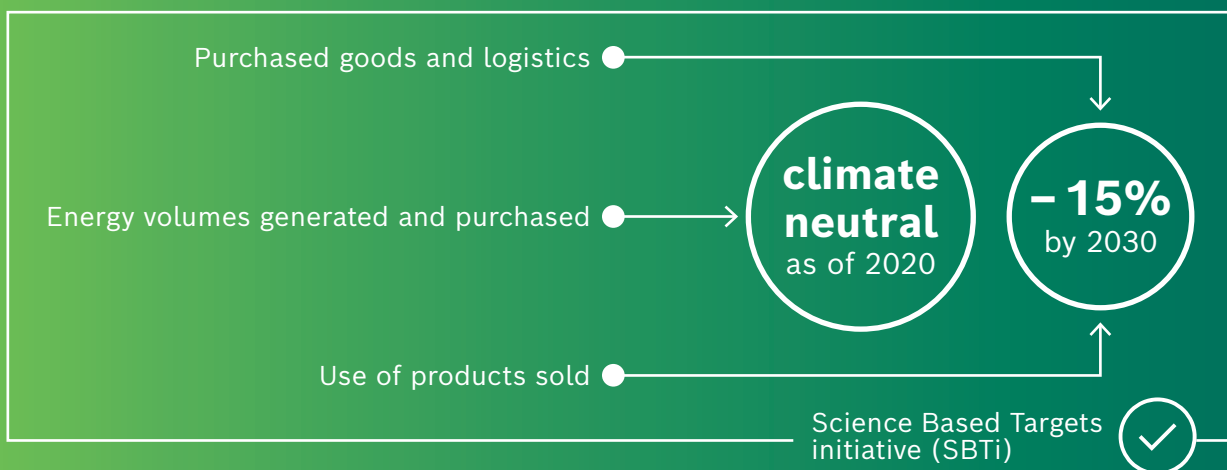


For more information about how we cut carbon emissions, please refer to our factbook 2019.

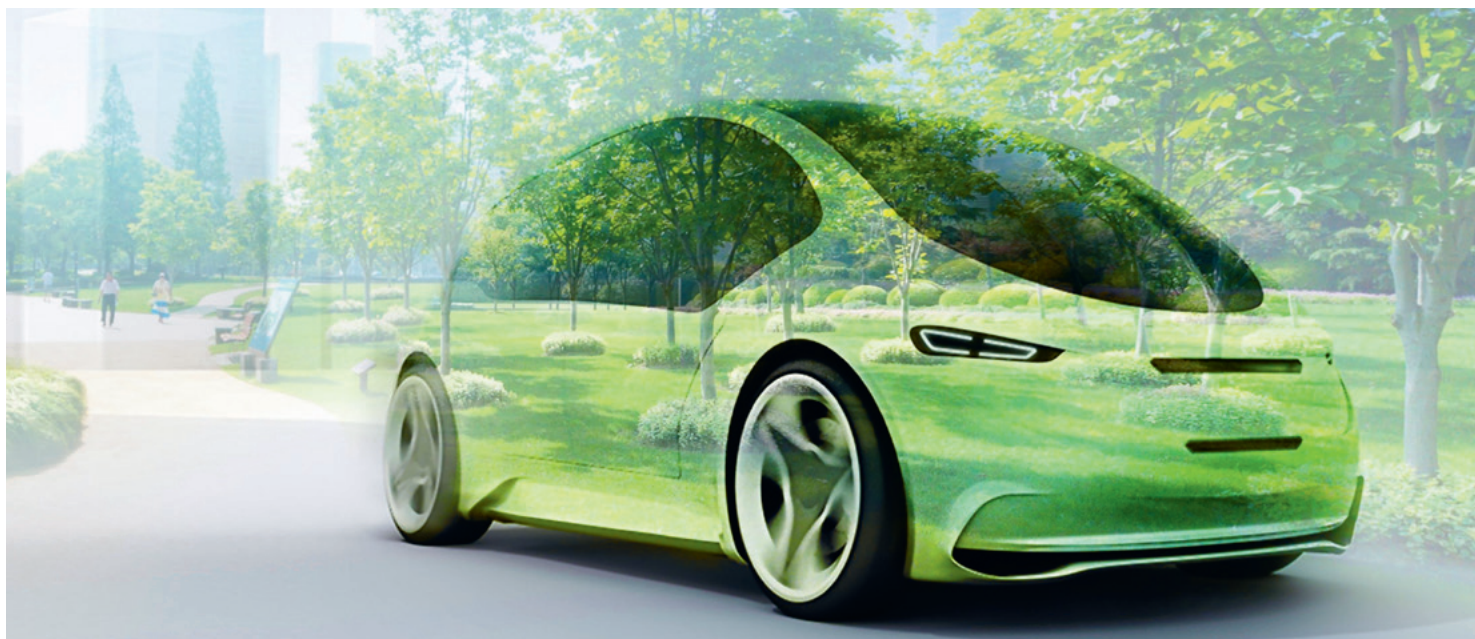
## Climate action across the entire value chain

In expanding our climate action further, we are also focussing on our indirect emissions – that is, purchased goods and services, business travel, and also the transportation and use of our products. Here again, we have an ambitious target: we will reduce our indirect emissions by 15 percent by 2030. We have thus set ourselves climate action targets across the entire value chain – and have had these confirmed externally by the Science Based Targets initiative (SBTi). The SBTi provides an independent assessment of companies' targets for reducing emissions using science-based best practices as reference points.

### Bosch climate goals







## Technology neutrality for better air quality

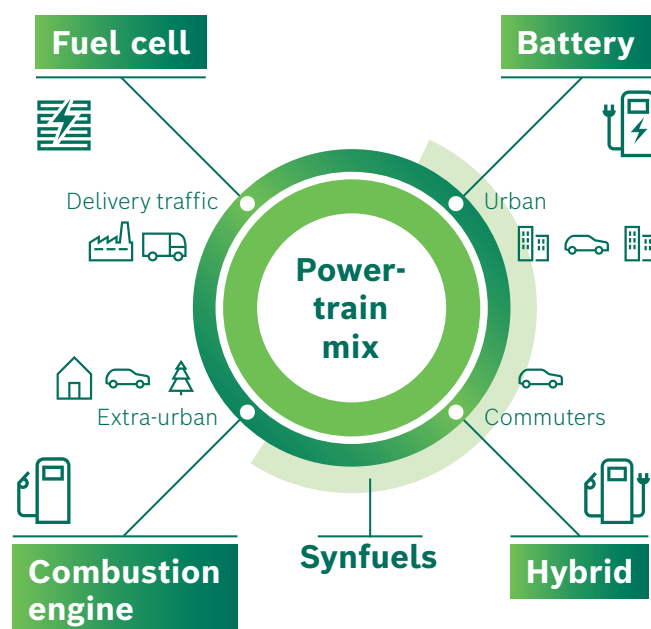
Mobility can make a big difference when it comes to climate action: transport currently accounts for 24 percent of greenhouse gas emissions worldwide, making it the second-largest contributor. Moreover, the transport sector also affects air quality in urban regions. If the climate targets set by policymakers are to be achieved, CO<sub>2</sub> emissions from traffic worldwide will have to be slashed by 50 percent over the next four decades – and indeed by at least 85 percent in advanced economies.

As one of the world's largest automotive suppliers, we already contribute to low-emission mobility today. We are determined to further reduce CO<sub>2</sub> emissions in the mobility sector by developing new powertrain technologies and by using synthetic fuels. Our vision is clear: the future of mobility will be emission-free. Therefore, we pursue technology-neutral development without limiting our efforts to a specific type of powertrain. Instead, we prefer to take advantage of the individual strengths of the various options available. Whether gasoline or diesel engines, powered by natural gas or electric drive – we are rigorously working on refining powertrain systems.

Find out more about innovative powertrain systems at Bosch – from combustion engines to electric drives and fuel cells.



## The Bosch powertrain mix



“Bosch is approaching future powertrain technology with an open mind.”

Dr. Stefan Hartung, Bosch board member and chairman of the Mobility Solutions business sector



## THE WAY FORWARD – AT OUR LOCATIONS



## Helping shape change

Many companies are currently working on unconventional ideas for new mobility solutions. Established in early 2019, the Progressive Mobility Players (PMP) business unit serves as a competent partner and central interface for our divisions within Bosch.

Three questions for Stefan Seiberth, Head of PMP

### What made you decide to establish PMP?

Mobility is changing faster than ever before, and new players on the market are seizing the opportunities offered by changing mobility. An increasing number of small, innovative firms are entering the electromobility market with unconventional methods and fresh ideas or offering new services for forward-thinking transportation. This is where PMP comes into play, as these customers are dependent on competent partners. PMP scans the new mobility market for trends, analyses customers' business models, and can then bring exciting innovations to our divisions, which then take them to the next level.

### What is your work with customers like?

In many cases, we are dealing with young start-ups operating at a faster pace and taking a different approach. They know exactly what they want to achieve and what their product should look like. It's not just that decisions have to be made much faster; they also expect us to come with new and all-encompassing technological solutions. In close collaboration with the customers, PMP concentrates on innovative technological solutions that will revolutionize the market of electromobility and mobility services. We understand the challenges that our customers face and are working on forward-looking business models. The reason customers find Bosch so attractive is that practically nobody else can offer a portfolio of comparable breadth, including aftermarket services. In electromobility, we are focusing on 50 customers, and we are also serving ten providers of mobility services.



### What is PMP's contribution to tomorrow's climate-friendly mobility?

More and more people want to be mobile, and traffic volumes are steadily increasing. As our cities continue to grow, we need new mobility concepts to complement private car ownership, with a mix of different options such as on-demand ride hailing or ride-sharing services. Consumers should be able to choose the mix of modes of transport that suits them best, and sustainability is also increasingly a major concern. In response, many vehicles are already banned from inner-city zones today. This situation brings two profound transformations: on the one hand, it is establishing electric drives that are free of local emissions as an alternative to the internal-combustion engine, and, on the other, our means of everyday transport are changing. We are seeing a shift from singular mobility focusing on one means of transport to multi-modal mobility with lots of new transport options. With PMP, we are breaking new ground to make mobility technologies more efficient, sustainable, and attractive. Together with our customers, we are working to make automated, electric, and connected driving a reality – for more effective climate action.



## THE WAY FORWARD – WITH OUR PRODUCTS

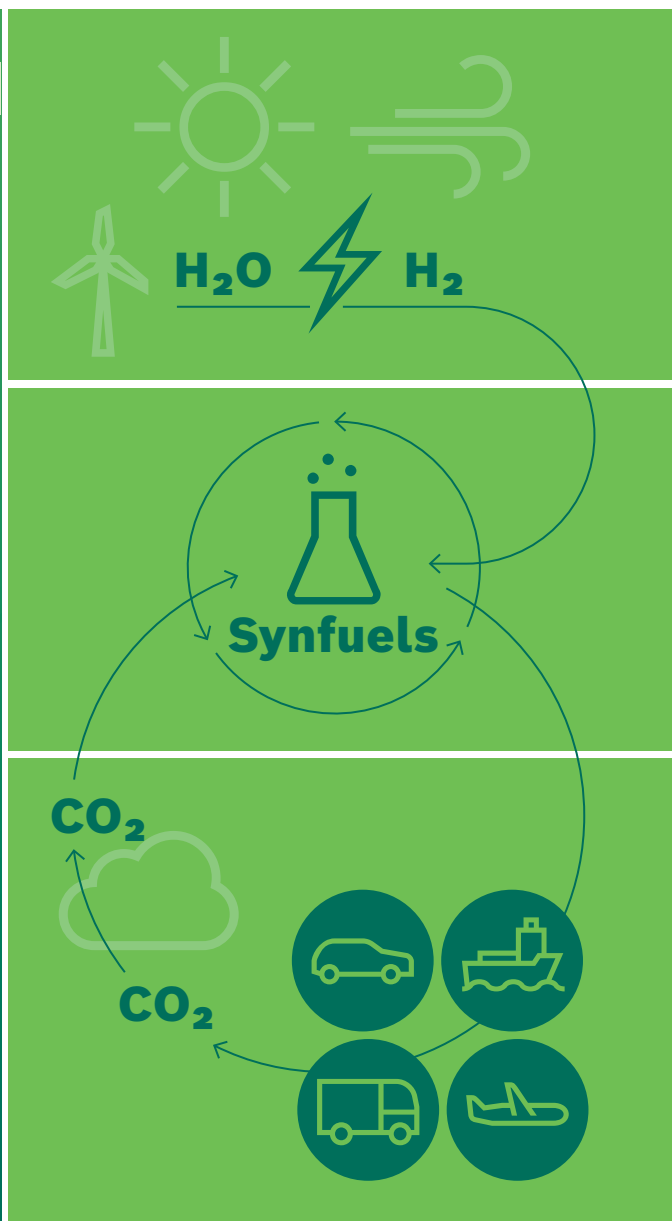


## Synfuels: fuels with potential

It is not possible to reach the climate targets with alternative drives alone: aircraft, ships, and trucks will continue to rely on internal-combustion engines for many years to come. New synthetic fuels, referred to as synfuels, are generated exclusively using renewable energies and can make a significant contribution to limiting global warming. It is already possible today to run internal-combustion engines in a climate-neutral way using synfuels, ideally completely substituting conventional fuels. Aside from automobiles, that means that it is not necessary to retrofit vessels, aircraft, or to some extent freight transport – modes of transport that will primarily be driven by internal-combustion engines

in the future. CO<sub>2</sub>-neutral combustion engines that run on synfuels are thus a very promising path toward emission-free mobility.

By 2050,  
systematic use  
of synthetic fuels  
could save up to  
**2.8 gigatons of CO<sub>2</sub>** worldwide.



### So what's next?

## Clear objectives, effective measures

At Bosch, we are quite clear about it: we want to make our products even more sustainable – not just in the automotive sector but throughout our product portfolio. That is why we have set ourselves ambitious targets also with respect to our products. To that end, we will drill

down deeper in the analysis of our products in 2020 and identify further potential for our products to make a contribution to global climate action. In addition, we will make all our air travel climate neutral as of 2020 using carbon offsets.



# We are serious about it: **climate neutrality as of 2020**

Global climate conferences, student demonstrations, and the calls of the United Nations all point to the same fact: rising CO<sub>2</sub> emissions are the global challenge of our times. To reduce them, clean sources of energy are a decisive factor. For us, there is no doubt about it: we must act and do so quickly. Already in 2020, we are making our over 400 locations worldwide carbon neutral. To achieve this, we are using four levers: energy efficiency, new clean power, purchasing of green electricity, and carbon offsets.



For a long time, global warming was an abstract notion. Water scarcity and extreme weather events are making it tangible and visible. Tsunamis, hurricanes, and heat waves speak clearly and demonstrate that global warming is having a wide-reaching impact on nature, society, and the economy.

The Paris Agreement placed the topic at the center of public attention. It aims to limit global warming to 1.5 degrees Celsius, if possible, by 2030 – and, in any event, to well below two degrees Celsius. “We will do everything in our power to support this effort,” says Urs Ruth.



Urs Ruth holds a PhD in physics and is a climate change and energy resources expert at Bosch. As a climatologist, he looks at the reasons, mechanisms, and effects of climate change, analyzing them from a scientific viewpoint.

“We recognize our responsibility: already in 2020, our production, research, and administration will be climate neutral worldwide.”

Dr. Urs Ruth, climate researcher at Bosch





CO<sub>2</sub> neutral

## Reducing our carbon footprint to zero

Energy is a central factor in the debate about effective measures to mitigate climate change. "Climate change is being caused by a growing concentration of greenhouse gases – first and foremost CO<sub>2</sub>. The increased concentration levels are clearly attributable to humanity's use of fossil resources," the climate expert says. "To limit global warming, we have to use energy efficiently and turn to clean energy sources – and do so as quickly as possible."

At Bosch, we recognize our responsibility. After all, we also consume energy: electrical power for the operation of manufacturing plant and machinery, thermal energy for heating and air-conditioning, and fuels to operate foundry furnaces.

To limit global warming, we have set ourselves a clear, but also highly ambitious, target: as of 2020, the more than 400 Bosch locations worldwide will be carbon neutral. That is an ambitious goal. Yet with a clear road map and consistent changes, we can get things moving.

## Two billion euros: Bosch's investment in carbon neutrality by 2030.

### Our path to climate neutrality

1

#### Increasing energy efficiency

The efficient use of electricity and heat is fundamental to reducing CO<sub>2</sub> emissions.

2

#### Increasing the proportion of new clean power

By concluding long-term procurement contracts, we contribute to new clean power facilities being built. We will also produce more energy from renewable sources ourselves.

3

#### Buying in more green electricity

We will considerably expand the volume of green electricity we source from existing plants.

4

#### Offsetting CO<sub>2</sub> emissions

We use carbon offsets, by which we specifically mean internationally accepted certifications such as the Gold Standard or the Verified Carbon Standard. However, in the future, we intend to use them only where we cannot avoid emissions.



For more information about climate neutrality at Bosch, please refer to our factbook 2019.





## THE WAY FORWARD – WITH OUR PRODUCTS



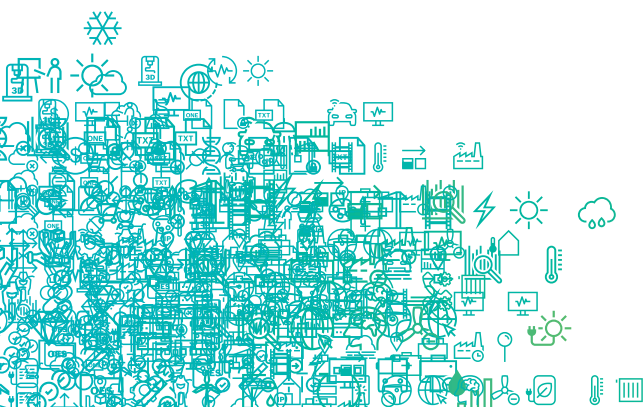
### “Quartierstrom” project: the future of energy supply?

Since September 2018, the Swiss town of Walenstadt has been trading district power – the electrical energy it generates. Households producing solar power themselves sell any excess they generate directly to their neighbors in the local electricity market. The idea behind this is for electricity to be consumed primarily in the region where it is generated. The electricity is traded using blockchain technology – which the Bosch IoT Lab largely developed.

When the fridge gets smart – hooking up a smart fridge to the district power network illustrates how connected household appliances can play an important role in sustainable energy supply: the fridge communicates with the local electricity market and adapts its energy consumption to current local conditions – for example, the appliance preferentially uses renewable sources of energy when they are available and affordable, or it can charge up a battery to store power for later use.

Blockchain  
technologies  
enable automated  
electricity  
trading.

Find out more about the forward-looking district power project.





## THE WAY FORWARD – AT OUR LOCATIONS



## All energy consumption data at a glance on the Energy Platform

Achieving transparency of energy consumption is the first step toward efficiency. Our Energy Platform IoT solution records energy-related consumption data, reports irregularities, and derives specific recommendations for action. This way, it can help to increase energy efficiency. The data recorded make it possible to monitor the consumption of each individual machine and control it in an efficient manner.

Since 2016, the Energy Platform has been in use at our plant in Charleston, United States. Meters, sensors, and production facilities are interconnected and record heat, electricity, and compressed-air consumption data. Visualization of the data helps to analyze and optimize consumption. This way, the energy coordinator quickly notices if a compressed-air system has sprung a leak – for example, if compressed air continues to be consumed after the system is switched off.

The Energy Platform helps to optimize energy consumption.



Discover the potential of connected energy management at Bosch.



## So what's next? Continuously enhancing quality – for maximum climate action

Our first step is clear: climate neutrality as of 2020. But we won't stop there: we are doubling efforts to drive up the quality of our measures – after all, we want to contribute to climate action as much as we can.

Up until 2030, we will rigorously optimize and refine the levers

- 1 **energy efficiency** and
- 2 **new clean power** – thereby making our contribution to the energy transition:



**Saving 1.7 terawatt-hours** of energy by 2030 – that is more than a fifth of our current annual consumption.

1

2



**Generating 400 gigawatt-hours** of energy from renewable sources ourselves by 2030 – this corresponds to the output of a photovoltaic system the size of about 300 soccer fields.



# Every drop counts: how we help conserve a valuable resource

Water is the basis of all life. At Bosch, too, we need this valuable resource for our daily work. That is why we consider it our responsibility to protect water and promote its sparing and conscientious use – especially at company locations in regions exposed to water scarcity and by offering innovative products.



Whether as drinking water or for preparing food, as a source of energy, for hygiene, or as a raw material – water is the basis of life for people, fauna, and flora. The World Economic Forum classifies water crises among the greatest risks worldwide. A total of one-quarter of humanity is currently threatened by acute water shortages – and the proportion is set to rise. As a result, this important resource needs to be managed responsibly.

Current climate change scenarios and associated forecasts show that the risks related to water scarcity and insufficient water quality will become more acute: by 2050, global water demand is expected to grow by between 20 and 30 percent. This is due in particular to demand from industry and private households.

## Systematic action in regions with water scarcity

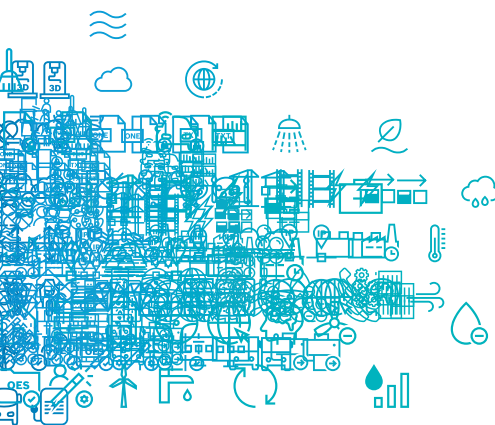
Bosch, too, is dependent on water as a resource in daily operations. We need it for our cooling systems, sanitary facilities, and as part of our technical processes. We therefore bear a special responsibility for using water sparingly. With this in mind, we focus our measures on the regions where they are most beneficial for people and the environment: namely, where there is an increased risk of water scarcity. A total of 61 of our sites are located in regions with water scarcity, including sites in India, the United States, and Mexico.

## Rigorously reducing water consumption

We have an ambitious goal: by 2025, we want to reduce our absolute water withdrawal at the 61 sites in regions with water scarcity by 25 percent. How can we achieve this? In water-stressed regions, we already use recycled water whenever possible. That means that water is reused several times in the cycle. We will further expand this measure. In addition, our water coordinators regularly check potential savings on-site as a basis for developing site-specific measures. The way our Indian locations in Jaipur and Ahmedabad are using rainwater is one example of this approach.



More information on the approach and measures for the economic use of water resources can be found in our factbook 2019.





THE WAY FORWARD – AT OUR LOCATIONS

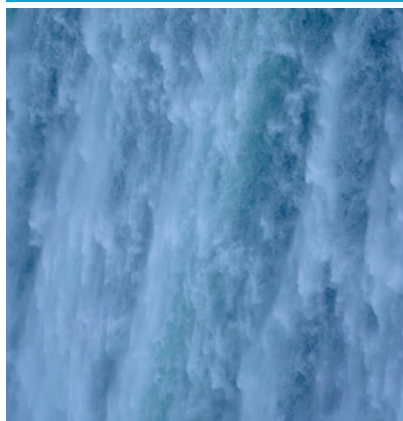


## Rainwater harvesting in Jaipur and Ahmedabad

Our two Indian sites in Ahmedabad and Jaipur are located in regions with severe water scarcity. In order to reduce water withdrawal by 25 percent over the next five years, both locations are evaluating their water consumption with reference to more than 100 measuring points, which allows them to derive targeted measures.

In Jaipur, consumption is mainly attributable to the sanitary facilities and the cooling system. The optimization of the cooling system and the use of rainwater, together with other measures, have made it possible to reduce water withdrawal by ten percent compared to the previous year. To prevent rainwater from flowing away unused during heavy monsoon rains, the Ahmedabad location has built a water reservoir with a capacity of 18,000 cubic meters. A total of 23 drainage shafts ensure that rainwater is fed into the groundwater – thus preventing flooding and enriching the groundwater table.

Each year, the Bosch plant in Ahmedabad feeds **around 81 million liters** of rainwater into the groundwater.



“A total of 61 Bosch locations are located in regions with an increased risk of water scarcity – this is where we intend to take systematic action.”



Andreas Siegle, water expert at Bosch





## THE WAY FORWARD – WITH OUR PRODUCTS



# Saving water through smart irrigation

Even beyond the boundaries of our organization, we contribute to saving water with innovative products and raise awareness for its sustainable use.

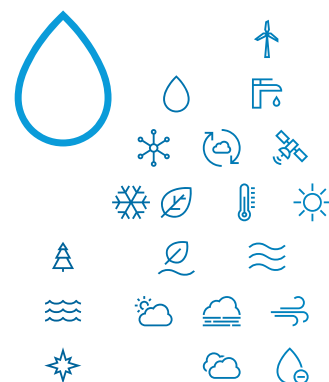
On the Andalusian olive plantations in southern Spain, Bosch sensors on individual leaves constantly monitor the state of irrigation of the olive trees. The sensors measure the pressure change of the cell sap in the leaf to determine whether the tree has enough water. Our smart irrigation systems help to optimize irrigation and thus reduce water consumption. Plantation manager Jose Antonio Fernandez Angulo is very enthusiastic about the technical support:

The method has allowed him to lower the water consumption on his plantations by around 20 percent, while at the same time ensuring the olive trees are optimally irrigated.

The sensors allow me to adjust the irrigation optimally and I can make sure the trees get exactly the right amount of water.



Find out more about connected agriculture at Bosch.



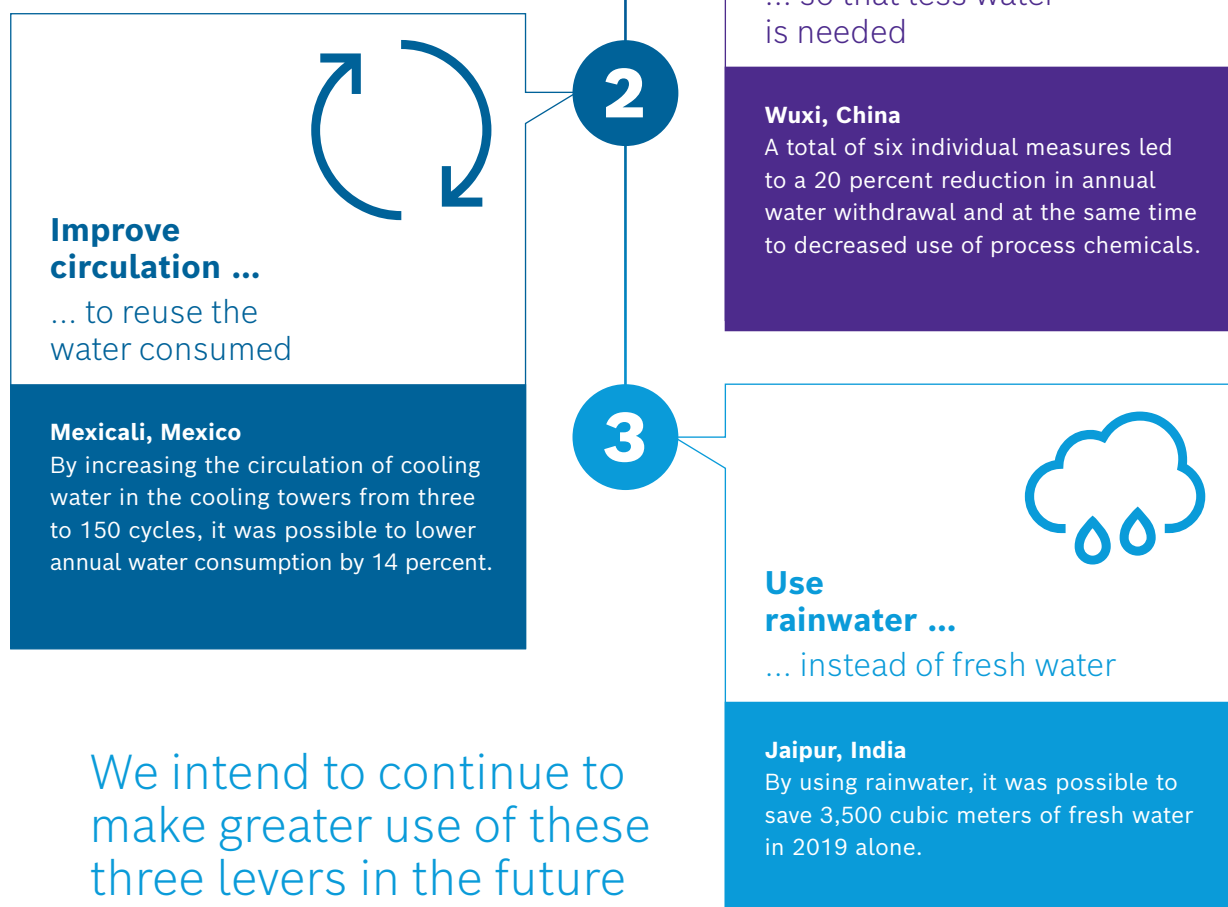




## So what's next? Three levers to conserve water

To achieve our goal and significantly reduce water withdrawal in regions with water scarcity, Bosch is making an annual budget of ten million euros available until 2025. Bosch locations in the affected regions can submit their project proposals.

Based on the applications submitted for what we refer to as our "water budget," we were able to identify three levers that make a particularly high contribution at our locations:



We intend to continue to make greater use of these three levers in the future in order to further reduce water withdrawal at our locations.





# City of the future: living sustainably in an urban world

By 2050, roughly two-thirds of the global population will live in cities. Urbanization is increasing and with it the challenges cities have to solve. The growing population is fueling demand for natural resources. Innovative ideas help to protect our environment and improve people's quality of life.



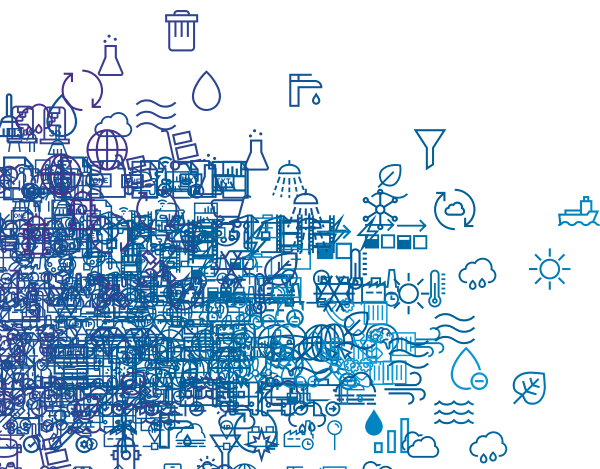
Just how important it is to protect our resources is underscored by Earth Overshoot Day, calculated each year by the U.S. organization Global Footprint Network. It refers to the day as of which humanity consumes more natural resources than can be regenerated in the given period. In 2019, this was the case at the end of July already – and each year, overshoot day is reached earlier than the year before.

In view of growing conurbations and rising consumption, the United Nations expects the global volume of waste to double from just under two billion metric tons (2016) to around four billion metric tons by 2050. One of the main factors is the consumer behavior of rising middle classes, which has a huge impact on the global consumption of resources and the production of waste.

## Products for the urban world

Every day, we use a large number of products that have an ecological footprint – either due to their manufacture, their use, or at the end of their life. This also holds true for the broad range of Bosch products. That is why we attach great importance to our goal of developing products that help to conserve natural resources – and we look at the entire product life cycle in this regard. To this end, we conduct life cycle analyses for all our key products. By assessing the environmental impact from the time our products are launched on the market through to their disposal, we identify potential for improvement. This has already allowed us to identify one key topic: we have sharpened our focus on the recyclability of the materials we use.

We are pursuing the principle  
of a circular economy: moving  
away from a one-way system  
and toward a closed loop.





THE WAY FORWARD – AT OUR LOCATIONS



## Clear conditions: reconditioning hazardous waste

In order to reduce our hazardous waste, we use various reconditioning methods. This way, we have been able to cut by half the share of hazardous waste from emulsions such as cooling lubricants. To reduce water-based solutions or mixtures with oils, we use vacuum distillation. This involves heating until the water evaporates. All substances with a higher boiling point, such as oils, are left over as residue. The rising vapors are thus virtually free of pollutants. This method thereby separates substances from the water, which can subsequently be reused.

## Less waste through recycling

To completely reduce the amount of waste disposed of in landfills – that is the aim of our “zero waste to landfill” campaign. Waste that ends up in a landfill cannot be recycled anymore, and valuable resources are hence lost. We want to ensure that the materials and substances we use can be reused again later. Our plant in Campinas, Brazil, demonstrates how that can be done: the waste produced by the plant is separated such that it can be recycled subsequently. As a result, it is not necessary to dispose of it in a landfill. Since 2017, the plant has not disposed of waste in landfills thanks to this method – and a total of 4,500 metric tons of waste have been recycled over the past two years.

We reduce  
our hazardous  
waste by up to  
**50 percent** by  
means of efficient  
reconditioning.



## Focus on hazardous waste

We are placing a primary focus on hazardous waste, which is generated in our processes above all as cooling lubricants, washing water, oils, and fuels. We are particularly keen to reduce them because it would allow us to do something that would vastly benefit society and the environment.



For more information about hazardous waste management, please refer to our factbook 2019.





Find out more about  
the Papillon rental  
project in Belgium.



#### HOW IT WORKS – WITH OUR PRODUCTS



## Lease concepts for a circular economy

We create services and products that make a contribution to a circular economy. Currently, Bosch subsidiary BSH Hausgeräte GmbH is testing the Blue Movement leasing service in the Netherlands, which provides an easy way to lease resource-efficient fridges, washing machines, and dryers. A win-win situation: customers have different subscription options to choose from, which also include repairs for the appliances, and the appliances are returned to us after the end of the lease term to recondition them for reuse or recycle them at the end of their life.

Another approach is being trialed by the pilot project “Papillon” in Belgium – also by BSH. Here the focus is not just on recycling but also on combating energy poverty: resource-efficient appliances are rented out to underprivileged households in collaboration with an NGO. The more efficient appliances lower the households’ energy and water bills.

“At the end of their life, the products find their way back to us instead of simply ending up in the garbage.”

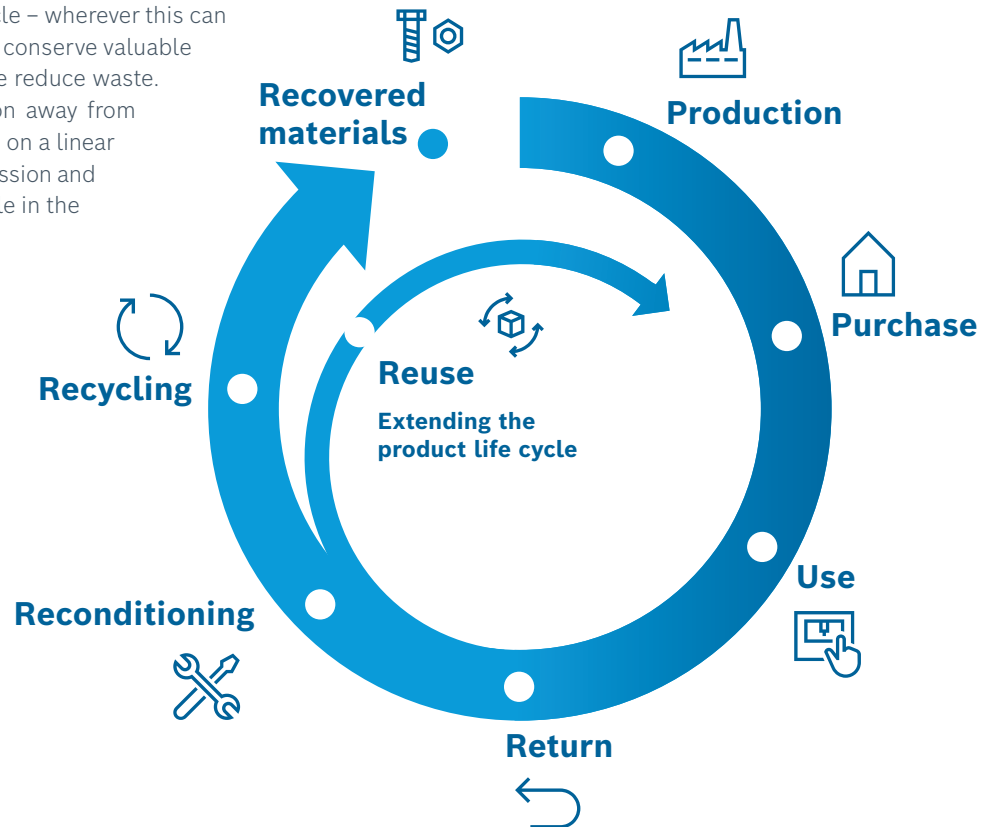
Volker Korten, in charge of environmental protection, resources and occupational health and safety at BSH





## Closed loop instead of one-way system

In our actions, we follow the guiding principle of a closed-loop or circular economy. To reduce the volume of waste, we want to have a materials cycle – wherever this can be done. This would help us to conserve valuable resources and at the same time reduce waste. This way, we want to transition away from traditional value creation based on a linear production-use-disposal progression and move toward a closed-loop cycle in the long term:



## So what's next? **Continuously reducing waste**

We want to continue reducing our hazardous waste in the future as well. To this end, we have identified potential that we will address:

### Cooling lubricants

We want to cut their use by another ten percent in 2020.



### Washing water

We want to reduce its use in 2020 by as much as 20 percent.





With the Internet, the world has grown even closer together and has become a global marketplace. At Bosch, too, we see how the advance of digitization is changing markets and further increasing the international division of labor. The opportunities of tomorrow lie in partnerships, knowledge sharing, and the acceptance of responsibility by individuals.



By connecting markets, globalization is increasing the pressure of competition. More intensive use is hence being made of the possibilities offered by the international division of labor. This poses a great challenge when it comes to ensuring transparency in the supply chain and that human rights are respected. At Bosch, we maintain supply relationships in 50 countries – and for each one our aim is to ensure compliance with sustainability standards.

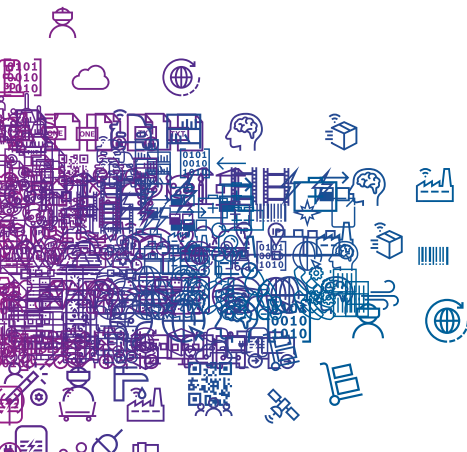
## Assuming responsibility worldwide

With roughly 440 subsidiaries and regional companies around the globe and 398,200 associates, we have a responsibility to society and the environment that knows no borders. To achieve our aim, we want to improve our own and our suppliers' sustainability performance. For us, responsibility does not end at the factory gate – it extends across the entire supply chain.

All our actions are based on our “Basic principles of social responsibility at Bosch.” In these, we commit to respecting human rights, equal opportunities, and fair and safe working conditions – and we expect our business partners in the entire supply chain to do the same. Our Code of Conduct for Business Partners sets out social and environmental requirements. As a founding member of value balancing alliance e. V., we endeavor to make companies’ environmental and social contributions measurable and comparable.



For more information about our responsibility in the supply chain, please refer to our factbook 2019.







## Strengthening trust: Digital Trust Forum

The Internet of things (IoT) is changing mobility fundamentally, making homes smarter and factories more productive. It has an influence on how we live, work, and move. We are working to build trust in digital products. With this in mind, we established the Digital Trust Forum: together with leading international associations and organizations, we want to encourage open dialogue among experts. The main focus of the first gathering in 2019 was the question of how to build and safeguard trust in digital systems. Back in 2015, we put our IoT Principles down in writing. The principles for our IoT business serve to build digital trust among our customers and partners. In addition, with our code of ethics for artificial intelligence (AI), we issued company guidelines in early 2020 governing the use of AI. The code of ethics for AI is based on the following maxim: humans should be the ultimate arbiter of any AI-based decisions.

“The aim of the Digital Trust Forum is to initiate open dialogue among experts to discuss the trust-related issues raised by the Internet.”

Dr. Michael Bolle, member of the board of management, chief digital officer /  
chief technology officer

**In brief:**  
the guidelines in the code of ethics for AI

- ▶ All Bosch AI products should reflect our “Invented for life” ethos, which combines a quest for innovation with a sense of social responsibility.
- ▶ AI decisions that affect people should not be made without a human arbiter. Instead, AI should be a tool for people.
- ▶ We want to develop safe, robust, and explainable AI products.
- ▶ Trust is one of our company’s fundamental values. We want to develop trustworthy AI products.
- ▶ When developing AI products, we observe legal requirements and orient to ethical principles.







## Connected actions for a connected world

At Bosch, responsibility does not end at the factory gate: we consider the supply chain end to end.

Globalization is accompanied by digital transformation. We clearly see the opportunities that this development offers and want to play an active role in shaping it. More than 30,000 software experts at Bosch around the globe work each day to develop new solutions for a connected world. Take for instance driving, industry, or living applications – today we connect more than ten million devices from various manufacturers using our open-source Bosch IoT Suite.

### THE WAY FORWARD – AT OUR LOCATIONS



## Reducing carbon and costs with digital supply chains

Digital supply chains are becoming an ever greater competitive advantage in the race to quickly fulfill personalized customer wishes in a connected world. At the same time, they offer key cost and efficiency benefits – for example, by making it possible to better monitor and link data from various functions within purchasing and transport management.

We are working together with our suppliers to digitize the receipt of incoming goods at our locations end to end. Another goal for the future is to enable them to view our manufacturing needs – around the world and in real time. This way, we can leverage artificial intelligence to identify any bottlenecks at an early stage, optimize transport networks, and reduce CO<sub>2</sub> emissions.

By 2021,  
we want to use  
cloud and platform  
solutions to handle  
**more than 85  
percent** of our global  
purchasing  
volume.





THE WAY FORWARD – WITH OUR PRODUCTS



## Changing the world through IoT

Every year we bring together connected technologies experts from around the world at Bosch Connected-World, one of the largest international industry conferences on the Internet of things. Some 5,000 executives, decision makers, digital transformers, innovators, developers, entrepreneurs, and IoT enthusiasts from different industries come together for two days to share their knowledge and develop new ideas.

At the hackathon, a three-day challenge, developers team up to produce innovative solutions. The agenda in 2019 for the first time also included a social impact challenge: five teams sought ways to help four nongovernmental organizations and the UN World Food Programme to overcome social and environmental challenges – from alleviating hunger in Africa to providing access to clean water and addressing reforestation in Indonesia. After 30 hours, the teams presented their impressive results. The winning team, Insectus, looked at how to breed high-protein insects and came up with a sensor-based solution for measuring temperature, CO<sub>2</sub> levels, and humidity in the incubator.



Hacking for a good cause – find out more about the Social Impact Challenge at Bosch ConnectedWorld 2019.



## So what's next? In shape for the future working world

Our approach to new technologies is aligned with our corporate social responsibility. We want to design tomorrow's factories – and involve our associates in this mission to prepare them for work in the future. We are therefore planning a broad-based training program with the aim of getting almost 20,000 associates in shape for artificial intelligence over the next two years.



We are getting  
**20,000 associates**  
in shape for  
artificial  
intelligence.



# Focusing on the individual: united for health and safety

As a company with global operations, we bear a special responsibility for our associates and society. This naturally includes health and safety – both within our company and beyond. Our goal is to promote people's health in the long term and contribute to safe working and living environments.



Worldwide, Bosch employs some 398,200 associates – and promoting their health is a fixed element of our corporate culture. Both associates and the company have a joint responsibility in this respect. Important elements in this regard include a wide range of health services around the world and raising associates' awareness for safety in the workplace.

Our occupational health and safety management covers a broad spectrum of topics – from preventive medical care, physical and mental fitness, and mental health through to workplace design and tips for a healthy diet. Back in 1917, we were one of the first employers in Germany to introduce in-house social services. In order to further develop our activities on mental health, we are currently conducting three research projects together with the University of Ulm. One focus is on the investigation of psychological stress in start-up culture.



For more information about occupational health and safety, please refer to our factbook 2019.

## Six principles for more safety

With six clear principles, our Safety Basics initiative forms the foundation for a culture of safety at Bosch. They are intended to support associates and executives to look out for each other and avoid accidents in their daily work:

- 1 Safety is the basis for everything we do
- 2 As leaders, we care about your safety
- 3 We ensure a safe work environment for all
- 4 We take care for each other's safety
- 5 We speak openly about safety
- 6 We have zero tolerance for negligence

We use a variety of communication measures to repeatedly draw attention to our principles because they lay the foundation for our daily activities.





A key to our success is recognizing dangerous situations before an accident occurs. So in order to prevent accidents at work, we focus on training and awareness-raising measures. We draw on innovative concepts and new technologies to provide our associates with attractive and varied offers.





**Safety  
is my  
business**



#### THE WAY FORWARD – AT OUR LOCATIONS



## Headset on and good to go – safety training 4.0

Water on the floor, defective cables, and misplaced fire extinguishers – Bosch associates learn what to do in such critical situations in our virtual safety training. Wearing an augmented reality headset allows participants to extend their actual perception through the application of technology. For instance, users can enter training rooms, including offices and production areas, where they can train their safety-related behavior by performing a variety of tasks. With the virtual exercises, we want to combine occupational safety with fun and curiosity and thus practice routine handling of critical situations in daily work.

The safety training course developed in cooperation with Heilbronn University has been run at all locations of the Chassis Systems Control division since April 2019.

“With augmented reality and fun elements, we want to provide an occupational safety experience and thereby make it something positive.”

Thomas Ritzenfeldt, occupational safety and environmental protection in the Chassis Systems Control division



## THE WAY FORWARD – WITH OUR PRODUCTS



## On the road with artificial intelligence

We are also committed to health and safety outside our factory gates: with our products, we want to improve people's quality of life and increase road safety. Day after day, we pursue our vision of accident-free mobility. Since many traffic accidents are caused by human actions, here, too, we are focusing on technical developments such as automated driving. In this way, we want to herald a new and, above all, safe era of mobility. With our new camera for automated driving, we are taking another important step forward: thanks to artificial intelligence, objects are detected even more reliably. The camera thus improves tried-and-tested driver assistance systems and extends their application range.



Learn more about AI for object recognition.



## How explosions can save lives

With more and more electric cars on the road, many drivers are increasingly uncertain what they should do or not do in the event of a collision. And rescue crews also face new challenges. The bottom line is that, just like conventional cars, electric vehicles also need specific safety measures. We have developed the "Pyrofuse" system to eliminate the risk of electric shock after an accident. For example, special microchips ensure that the vehicle's power is switched off within a fraction of a second – by using tiny explosions that blow up parts of the connection to the battery. This way, the rescue services can work more safely, and vehicle occupants are protected from fire and electric shocks.

Pyrofuse quickly and reliably shuts down the circuit in the event that an electric car is involved in an accident.



## So what's next? Safely toward the future

Recognizing hazards early on and correctly assessing them is important for the continuous development of occupational safety. Only in this way can appropriate countermeasures be introduced and accidents prevented. As part of our Safety Basics initiative, we are intensifying our efforts to address the topic in 2020. Together with

our associates, we want to promote dialogue on the need for safety precautions in everyday work. In training courses, we systematically draw attention to the topic and engage in dialogue on what to do in an emergency and on dealing with service providers. The focal point is on each individual's personal responsibility.



# Bosch at a glance

The Bosch Group is a leading global supplier of technology and services. It employs roughly 398,200 associates worldwide. It comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. In 2019, the company generated sales revenue of 77.7 billion euros.

Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. The focus is on the “Invented for life” ethos: Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. Bosch’s strategic objective is to create solutions for a connected world. As a leading IoT company and with its expertise in sensor technology, software, and services, Bosch offers groundbreaking inspiration for smart homes, smart cities, connected mobility, and connected manufacturing. The basis for the company’s future growth is its innovative strength. Bosch employs some 72,600 associates in research and development at 125 locations across the globe.

The company ownership structure secures the Bosch Group’s financial independence and allows the company to plan for the long term and make up-front investments in its future.

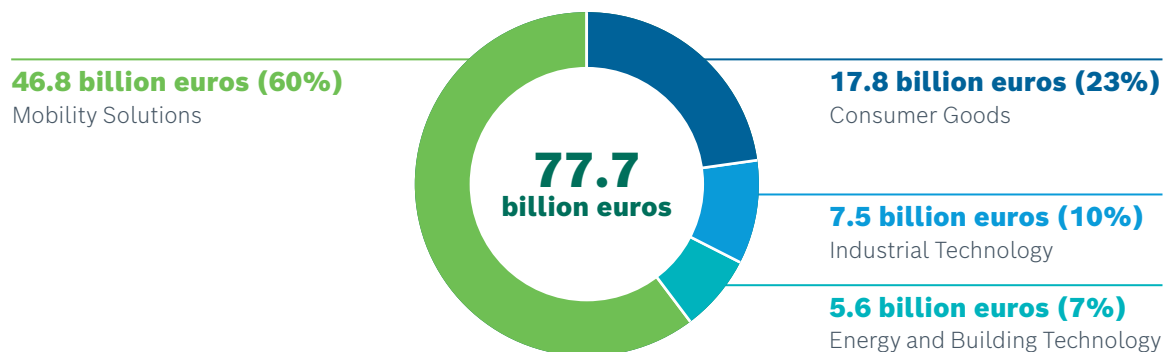
A total of 92 percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

For further information on Robert Bosch Stiftung and its projects, visit [www.bosch-stiftung.de/en](http://www.bosch-stiftung.de/en).



Bosch Group

## 2019 sales revenue by business sector





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**For further information about the company and sustainability at Bosch, visit** [sustainability.bosch.com](https://sustainability.bosch.com).



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