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Robert Bosch GmbH
Postfach 10 60 50
70049 Stuttgart

Media und Public Relations
Leitung: René Ziegler
Presse-Forum:
www.bosch-presse.de



Bosch significantly increases sales and earnings **A successful business year in 2017**

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- ▶ Sales increase to some 78 billion euros
- ▶ Result from operations climbs to 5.3 billion euros
- ▶ Mobility Solutions business sector grows faster than automotive production
- ▶ New Industry 4.0 unit has 500 associates
- ▶ A host of solutions for smart agriculture and smart cities
- ▶ Bosch CEO Denner: “We recognized the potential of connectivity early on and are now converting it into business success.”

Stuttgart and Ludwigsburg, Germany – In 2017, Bosch achieved a strong 6.7 percent increase in sales. According to preliminary figures, the supplier of technology and services generated sales of 78 billion euros last year. Adjusted for exchange-rate effects, that represents an increase of 8.3 percent. Sales results were negatively impacted by exchange-rate effects to the tune of some 1.2 billion euros. “We exceeded our growth forecasts and further improved our profitability. In 2017, our sales were higher than ever,” said Dr. Volkmar Denner, chairman of the board of management of Robert Bosch GmbH, speaking at the press briefing on preliminary figures in Ludwigsburg, Germany. As a result of its innovative strength and a strategy focused on connectivity, the company remains on a growth trajectory. As Denner explained: “We recognized the potential of connectivity early on and are now converting it into business success.” Earnings from operations before interest and taxes (EBIT) rose to some 5.3 billion euros in 2017. This equates to an EBIT margin from operations of 6.8 percent. As Professor Stefan Asenkerschbaumer, the CFO and deputy chairman of the board of management, explained, “Bosch’s success in its core business finances its efforts to become a leading supplier of IoT technology and mobility solutions.” Looking at the year ahead, the company sees numerous opportunities to bring connectivity to further areas, such as factories, buildings, and cities, as well as to transform mobility. Denner also stressed the importance of transforming corporate culture for the digital transformation.

Robert Bosch GmbH
Postfach 10 60 50
70049 Stuttgart, Germany

Email Sven.Kahn@de.bosch.com
Phone +49 711 811-6415
Fax +49 711 811-5183891

Corporate Communications
and Brand Management
Senior Vice President: Dr. Christoph
Zemelka
www.bosch-press.com

New: an Industry 4.0 operating unit

Denner said that connectivity and digitalization have become part of day-to-day business at Bosch, where they are firmly anchored. “The transformation provides us with a further opportunity to show that excellence is not only something that exists on paper at Bosch, but in practice as well – in both a technological and a commercial sense.” Bosch sees tremendous sales potential in connected industry, or Industry 4.0. A new operating unit, Bosch Connected Industry, began operations with 500 associates at the start of January 2018. It is here that Bosch will pool all its Industry 4.0 activities and expertise, especially concerning software and services. Going forward, Bosch will also contribute its expertise in Industry 4.0 implementation to an advisory service for third parties. Between now and 2020, the company aims to exploit Industry 4.0 to increase sales by more than a billion euros. Having acquired a stake in the map provider [HERE](#), Bosch will be able to unlock further potential for projects in the Industry 4.0 domain.

Connectivity addresses fundamental challenges

Denner emphasized the importance of connectivity over the internet of things: “Our planet can only provide a livable home to billions of people if we find innovative solutions to pressing issues.” Bosch currently has some 170 IoT projects that address fundamental challenges such as population growth, urbanization, air pollution, and climate change. “We use the internet of things to connect the real world in a bid to improve quality of life,” Denner said. In 2017, for example, the company introduced new solutions for [smart farming](#), or connected agriculture, which it is hoped will help feed eight billion people by 2025. Here, sensor-based [solutions](#) and [artificial intelligence](#) are being deployed in the cultivation of [asparagus](#), [strawberries](#), and [tomatoes](#). Bosch technology is also helping achieve greater efficiency and sustainability in [oyster farming](#) and cattle ranching. The digital agriculture market is expected to grow more than 70 percent by 2020.

Smart homes and smart cities: living space for billions of people

In response to the increasing number of mobility and IoT applications for semiconductors, Bosch is building a [wafer fab](#) in Dresden and intends to invest more than a billion euros in the new facility by 2021. Among the areas of application for these chips are smart homes. For the smart kitchen, Bosch will offer not just connected household appliances, but an increasing number of digital services as well. Its [Home Connect ecosystem](#) incorporates an app provided in twelve languages by the [Kitchen Stories](#) start-up. The app, which has already been downloaded more than 15 million times, contains over 1,000 recipes and uses videos or photos to demonstrate how to prepare them. At CES in Las Vegas at the start of the year, Bosch introduced its comprehensive

portfolio for connecting entire cities. Among its offerings is the “[Climo](#)” mobile air lab, which provides data on city air quality in real time. By 2025, 80 of the world’s metropolises will be smart cities, and even now, Bosch is pursuing 14 beacon projects in this field. The smart-city market will grow to 700 billion euros by 2020.

Urban mobility: emissions-free, stress-free, and accident-free

Urbanization goes hand in hand with a multitude of problems. Urban traffic will triple by 2050. “We want to achieve urban mobility that is emissions-free, stress-free, and accident-free. To that end, we will automate, electrify, and connect road traffic,” Denner said. Starting this summer, the [COUP](#) sharing platform is bringing its e-scooters to the streets of Madrid. Automation, too, will help relieve the burden of urban traffic – by the start of the coming decade, Bosch and [Daimler](#) will make fully automated and driverless vehicles a reality on city streets. The first test vehicles will be on the road as early as 2018. Bosch and Daimler also moved one step closer to automated driving in 2017: in the Mercedes-Benz Museum parking garage in Stuttgart, the companies launched the world’s first solution for a fully [automated valet parking](#) service.

Powertrain of the future: alliances drive fuel cells forward

Regarding electrification, Bosch made key strides in 2017. For hybrid vehicles, it started production of a newly developed [48-volt battery](#) which is easy to integrate into new vehicle models. Established manufacturers and start-ups alike can thus dispense with long and expensive development processes. As of 2019, Bosch’s new [electric axle drive](#), or e-axle, will increase electric cars’ range. “Bosch is picking up the pace in electromobility. We acquired numerous orders in 2017, some worth billions of euros,” Denner said. Bosch is working with Nikola Motor Company, a U.S. start-up, on developing a hydrogen-powered [e-axle for heavy trucks](#). “By 2030 at the latest, fuel cells will play a key role in the powertrain mix. We are stepping up our development activities and gradually expanding our product portfolio,” Denner said. In China, the largest market for electromobility, Bosch is collaborating with the truck engine manufacturer Weichai on a pilot project to develop fuel cells for trucks. As Denner explained: “From bicycles to trucks – in the electromobility business, no automotive supplier is as broadly diversified as Bosch.”

A technologically viable vision: the carbon-neutral combustion engine

Denner stressed the importance and potential of the combustion engine: “It is unlikely that we will meet our CO₂ targets in Europe without diesel.” Referring to the ongoing discussion about driving bans on diesel vehicles, Denner pointed out that efficient and resource-conserving diesel technology already exists. And not only that: “Our test vehicles meet 2020 limits even today. We are already developing and testing systems that are actually well below these limits,” said

Denner, whose responsibilities include research and advance engineering. Bosch engineers have an ambitious goal: to design a combustion engine that “breathes out” only what it “breathes in.” With the exception of CO₂, its emissions should be indistinguishable from the ambient air. When powered with [synfuels](#), such engines would even be carbon-neutral.

Innovation culture: driving forward connectivity

“There can be no digital transformation without cultural change,” Denner said. “We are rethinking leadership and collaboration, which in turn is strengthening our culture of innovation.” In many areas, Bosch is breaking down hierarchies and erasing the boundaries between departments and functions. The company has already phased out more than two-thirds of the red tape that is typical for large enterprises, and done away with individual bonuses. Denner believes the [culture of innovation](#) at Bosch offers a clear competitive advantage: “We are fortunate in having a workforce that is accustomed to continuously striving for improvement.”

Business developments in 2017 by business sector

All business sectors played a role in the positive development of the company’s business in 2017. According to preliminary figures, sales in **Mobility Solutions** rose by 7.8 percent – three times faster than global automotive production – to 47.4 billion euros. Adjusted for exchange-rate effects, growth was 9.2 percent. This success was driven primarily by strong demand for diesel injection systems, especially from the commercial-vehicle sector, for gasoline injection systems, as well as for driver assistance and infotainment systems. In the **Consumer Goods** business sector, BSH Hausgeräte and Power Tools increased sales by 4.5 percent to 18.5 billion euros. After adjusting for exchange-rate effects, sales grew 6.7 percent. BSH Hausgeräte in particular performed well in 2017, its 50th anniversary year. The **Industrial Technology** business sector saw powerful growth of 7.7 percent, with sales rising to 6.7 billion euros. This is equivalent to an increase of 8.5 percent after adjusting for exchange-rate effects, an increase that was due mainly to the Drive and Control Technology division. The **Energy and Building Technology** business sector achieved sales of 5.4 billion euros, which equates to an increase of 3.1 percent, or 4.8 percent after adjusting for exchange-rate effects. The Thermotechnology and Security Systems divisions won over consumers with connected solutions for heating and air conditioning, plus smart technology for building automation and security.

Business developments in 2017 by region

In **Europe**, Bosch’s business developed very well, with sales rising 5.5 percent (6.3 percent after adjusting for exchange-rate effects) to 40.7 billion euros. One of the reasons for this was continuing growth in western and central Europe. In

North America, the technology and services company's exchange rate-adjusted growth there was on a par with the previous year. Sales totaled 12.1 billion euros, a nominal decline of 2.3 percent. The recovery in **South America** continued, with growth of 15 percent to 1.6 billion euros. Adjusted for exchange-rate effects, that represents an increase of 12 percent. Bosch saw strong growth in **Asia Pacific** and **Africa**, with sales rising to 23.6 billion euros. This is a year-on-year increase of 14 percent, or 17 percent after adjusting for exchange-rate effects.

Headcount increase: more than 400,000 associates

In 2017, the Bosch Group's workforce grew by some 11,200 around the world. As of December 31, 2017, the Bosch Group employed 400,500 people. Bosch hired several thousand software and IT specialists around the globe. The company expanded its workforce primarily in Asia Pacific and central and eastern Europe. In Germany, headcount grew by 3,800 associates.

Outlook for 2018: improved sales and result despite a weak economic environment

Bosch expects moderate global economic growth of some 2.5 percent in 2018. Overall, the supplier of technology and services sees a series of economic risks due to geopolitical developments such as the Brexit negotiations, unpredictable U.S. foreign policy, and the tensions with North Korea. Bosch assumes economic momentum will slow down, particularly in China. Despite this difficult environment, Bosch plans to further increase its sales and result in 2018 and to continue advancing its transformation into a leading IoT company and provider of mobility solutions.

An overview of key figures can be found [here](#).

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Infocharts: #1320141, #1320142, #1320143, #1320144, #1320145, #1320146

Contact persons for press inquiries

René Ziegler, phone: +49 711 811-7639

Nicole Neuer, Phone: +49 711 811-11390

Sven Kahn, phone: +49 711 811-6415

The Bosch Group is a leading global supplier of technology and services. It employs roughly 400,500 associates worldwide (as of December 31, 2017). According to preliminary figures, the company generated sales of 78 billion euros in 2017. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT company, Bosch offers innovative solutions for smart homes, smart cities, connected mobility, and connected industry. 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 create solutions for a connected life, and to improve 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 450 subsidiaries and regional companies in some 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. At 125 locations across the globe, Bosch employs 62,500 associates in research and development.

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 up-front 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.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com, www.twitter.com/BoschPresse.



BOSCH

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A successful business year in 2017

Bosch significantly increases sales and earnings

Presentation by
Dr. Volkmar Denner,
chairman of the board of management
of Robert Bosch GmbH
and Prof. Stefan Asenkerschbaumer,
deputy chairman of the board of management
of Robert Bosch GmbH,
at the press briefing on January 29, 2018

Check against delivery.

Robert Bosch GmbH
Postfach 10 60 50
70049 Stuttgart

Corporate Communications and
Brand Management
E-mail: Sven.Kahn@bosch.com
Phone: +49 711 811-6415
Fax: +49 711 811-5183891

Senior Vice President:
Dr. Christoph Zemelka
www.bosch-press.com

Ladies and gentlemen,

- Welcome to the 2018 press briefing on our preliminary figures. Thank you for being our guests this evening. We are also pleased to be welcoming international media to this event for the first time.
- Before we begin with the traditional presentation of our preliminary figures, I would like to say a few words about today's event.
- We are here in the new offices of Bosch's start-up platform, soon to be home to some 200 associates. Of those 200, 150 will work in innovation teams and 50 in start-ups currently supported by the platform; you had the chance to learn about one of these in more detail earlier.
- Werkzentrum Weststadt, the complex you are in this evening, offers our young entrepreneurs a professional home. Here they can create business models for the connected world, enjoy a creative freedom that allows ideas to grow, and flourish as entrepreneurs. From associate to CEO – here, short career paths are possible and desired.
- What role will new forms of leadership and collaboration play at Bosch in the future? And not just here in Ludwigsburg, but throughout the entire company? I will go into this in more detail later. After all, the ubiquitous topic of connectivity is not only a question of technology, but also one of corporate culture.
- First on the agenda this evening is a review of the 2017 business year, and an initial outlook for 2018. What progress is Bosch making with digital transformation? What kind of business success are we achieving with connectivity?
- This evening, we will show that, for Bosch, connectivity and digitalization are not mere hype or some topic of the far-off future. The company's transformation has become part of day-to-day operations and is firmly anchored there. Bosch aims to be a leading IoT company. This has long been the case for our mobility solutions business, so we are taking that as our model – with foresight and especially with firm commitment. The transformation provides us with a further opportunity to show that excellence is not only something that exists on paper at Bosch, but in practice as well – in both a technological and a commercial sense.

- The digital transformation means a major break with the past, but it also offers a promising future. Connectivity delivers technical solutions for many fundamental challenges: population growth, urbanization, aging, and climate change. Our planet can only provide a livable home to billions of people if we find innovative solutions to the most pressing issues of our times. Such solutions need to be smart, connected, and digital – precisely what we are working on.
- Before we go into the details of the preliminary 2017 figures, I wish to say one thing in our characteristically understated way: we didn't do too badly. In 2017, we exceeded our growth forecast, and further improved our result. Bosch remains on a growth course.
- Mr. Asenkerschbaumer will now present the details.

Business year 2017: expectations exceeded, targets met

- Thank you, Mr. Denner. Good evening, ladies and gentlemen. I will start off with the highlights of the preliminary figures for 2017:

78 billion euros – sales in 2017

6.7 percent – sales growth in 2017

5.3 billion euros – EBIT from operations in 2017

6.8 percent – EBIT margin from operations in 2017

- In business terms, 2017 can be summarized as follows: expectations exceeded, targets met.
- According to preliminary figures, Bosch Group sales rose from 73.1 billion euros to around 78 billion euros – a new record for our company.
- Sales growth amounted to 6.7 percent, or 8.3 percent after adjusting for exchange-rate effects.
- As in 2016, last year's sales results were negatively impacted by exchange-rate effects to the tune of some 1.2 billion euros.

Development of individual business sectors

- Now I'd like to review how our various business sectors developed. Encouragingly, all business sectors saw considerable growth in 2017.
- Sales in **Mobility Solutions** rose by 7.8 percent to 47.4 billion euros. Adjusted for exchange-rate effects, that figure is 9.2 percent. This means the business sector outpaced global automotive production by a factor of three. Many factors drove this highly positive development, including strong demand for diesel injection systems, especially from the commercial-vehicle segment, for gasoline injection systems, and for driver assistance and infotainment systems.
- Sales generated by the former Starter Motors and Generators division, now SEG Automotive, were included for the last time. We closed on the sale of the business to a Chinese purchaser consortium at the end of 2017.
- In the **Consumer Goods** business sector, BSH Hausgeräte and Power Tools generated sales of 18.5 billion euros. This equates to an increase of 4.5 percent, or 6.7 percent when adjusted for exchange-rate effects. Both divisions' connected product innovations for the home and garden are enjoying ever more popularity.
- We were particularly pleased with the development of the **Industrial Technology** business sector. After two years of declining sales, the sector saw powerful growth of 7.7 percent, or 8.5 percent when adjusted for exchange-rate effects. Sales increased to 6.7 billion euros, thanks to the Drive and Control Technology division. Following a reorganization, the division has regained its former strength, and thus demonstrates how restructuring can encourage growth.
- The **Energy and Building Technology** business sector achieved sales of 5.4 billion euros, an increase of 3.1 percent, or 4.8 percent after adjusting for exchange-rate effects. Consumers in 2017 wanted connected solutions for heating and air conditioning, plus smart technology for building automation and security. Our services business continues to exhibit strong growth.

Business developments by region

- Now to the development of sales in the individual regions. Overall, all regions except North America saw growth in 2017.
- In **Europe**, Bosch's business developed well, with sales rising 5.5 percent (6.3 percent after adjusting for exchange-rate effects) to 40.7 billion euros. One of the reasons was continuing growth in western and central Europe.
- Bosch's growth in **North America** was at the same level as the previous year after adjusting for exchange-rate effects. Sales reached 12.1 billion euros, a nominal decline of 2.3 percent. Growth in the automotive industry in particular failed to meet expectations.
- In **South America**, the recovery continues with double-digit sales growth of 15 percent. Sales now stand at 1.6 billion euros. After adjusting for exchange-rate effects, this is an increase of 12 percent. Relevant markets for Bosch, such as agriculture, automotive, and pharmaceuticals, continue to recover and are performing well.
- In **Asia Pacific**, the Bosch Group generated sales of 23.6 billion euros. Compared to last year, this is a significant increase of 14 percent, or 17 percent after adjusting for exchange-rate effects. The primary driver of this growth was positive business development in China and India.

Development of result in 2017

- Ladies and gentlemen, the improvement in our EBIT from operations (earnings from operations before interest and taxes) was even better than our positive sales development might suggest.
- According to preliminary figures, in 2017 the Bosch Group recorded EBIT from operations of 5.3 billion euros – another record high.
- This equates to an EBIT margin from operations of 6.8 percent.
- With this, we have surpassed last year's EBIT from operations of 4.3 billion euros and EBIT margin of 5.8 percent.
- The increase in EBIT margin from operations by a full percentage point is primarily due to the positive business performance, as well as in small part to a change in how interest expenses for pension provisions are disclosed. Calculated on a like-for-like basis, the EBIT margin has increased by roughly 0.6 percentage points.

Headcount development in 2017

- As of December 31, 2017, Bosch Group headcount had increased by some 11,200 to approximately 400,500 associates worldwide.
- New associates were taken on primarily in Asia Pacific and in central and eastern Europe. In Germany, headcount grew by 3,800 associates.
- How can we summarize business developments in the Bosch Group last year?
- Sales growth – both nominal and adjusted for exchange-rate effects – exceeded our expectations. Bosch remains on a growth course.
- Development varied by region and by business sector. However, all business sectors saw considerable growth and contributed to the group's overall growth.
- However dynamic the transformation in technology and markets, Bosch is steadfast in its investment in the future. Research and development spending totaled 7.5 billion euros last year.
- Business developments in 2017 would indicate that the Bosch Group's innovative strength is still formidable. We are driving our core business forward with great success, even as we shift the company's focus to connectivity and the internet of things.

Business year 2018: a volatile geopolitical situation

- Before I speak about our business targets for the new year, let me first take a look at the general situation in 2018.
- Despite the positive development of the global economy over the past few months, our outlook for 2018 is cautious. Why is that?
- In contrast to 2017, we are expecting to see slower global growth. True, we expect the global economy to grow by at least a healthy 2.5 percent; however, we see several geopolitical risk factors, such as the Brexit negotiations, the situation in Turkey, and tensions in the Arab world. Other factors clouding the outlook are U.S. foreign policy, which is difficult to predict, and tensions with North Korea.
- In Europe, we expect the recovery following the years of crisis to continue, and with it, decent business developments in 2018.

- In view of the rapid growth seen at the end of 2017 and the cuts in the tax rate, our expectations for economic developments in North America are more positive than they were just a few months ago. That said, we anticipate a downturn in the economic cycle as the year proceeds.
- Despite structural weaknesses, South America will continue its recovery from the crisis and will post positive growth.
- In Asia Pacific, the slowdown in China's growth will leave its mark. We assume the Chinese government will actively support measures to correct overcapacity and excessive levels of debt, which will slow economic growth temporarily.
- In terms of industrial sectors, the picture is a varied one:
- Growth in global vehicle production in 2018 will remain below 2017 levels. We are expecting weaker growth in automotive production in our core markets, such as China and Europe.
- For the mechanical engineering industry, we expect moderate, albeit initially strong, upward momentum.
- Due largely to continued low interest rates and low inflation, we expect a more positive picture in private demand, in keeping with the broader upward economic trend. We expect to see a slight uptick in developed countries in particular.
- Against this geopolitical backdrop, what are the Bosch Group's business targets for 2018?
- We plan to further increase sales and earnings. In 2018, we must continue to systematically boost the competitiveness of all our business sectors. We will continue to invest large amounts in the future of the company, especially in mobility.
- Mr. Denner will now provide more specifics on our plans: how we will pool our expertise, leverage strategic progress, and take deliberate steps to translate the transformation into a commercial advantage.

Digital transformation: day-to-day business at Bosch

- Thank you, Mr. Asenkerschbaumer. Ladies and gentlemen, I want to start the second half of our presentation by asking a question. Has the digital transformation already taken place, or is it still underway?

- I believe we need to be fully aware that we are just at the beginning. Industries and markets have yet to see the full disruptive impact of connectivity, which will lead to major upheaval. Bosch recognized this trend early on. As early as 2008, so ten years ago, we made our first acquisition for today's internet of things in the form of Bosch Software Innovations. And back in 2011, we underlined the importance of seeing the car as part of the internet. It is perhaps because Bosch was a pioneer in this area that the company is already in the thick of the digital transformation today. In fact, it has become part of our day-to-day business.
- However, we must realize one thing: although Bosch had an excellent head start, there is still a long way to go. The digital transformation is becoming a constant in an environment driven by technology and market changes.
- Despite this, our IoT strategy is starting to bear fruit. Let me give you a few facts to illustrate this:
 - Bosch Software Innovations has already designed, developed, and carried out 250 international IoT projects.
 - We are currently working on 170 IoT projects of our own in areas as varied as connected mobility, connected buildings, connected industry, and connected agriculture.
 - We sold 38 million web-enabled products in 2017.
 - Today, the Bosch IoT Suite connects 6.2 million sensors, devices, and machines with users and company applications.
 - We recognized the potential of connectivity early on, and have been systematically preparing ourselves for it for nearly ten years. For example, we have steadily expanded our software and IT expertise. With over 25,000 software experts, today we are a software company, too. But how do we differ from internet companies in the U.S. and Asia? Where Silicon Valley connects the digital world, Bosch connects the real world. Above all, our approach in the internet of things is aimed at achieving concrete improvements in people's real, everyday lives.

Broad range of IoT solutions for fundamental challenges

- Let's take a look at some of the highlights in the range of Bosch IoT projects:
- **Connected mobility:** In major U.S. metropolitan areas and a number of cities in Europe, the community-based parking solution Bosch devised is helping to reduce the number of miles driven in the search for parking.
- **Connected cities:** Some 7,700 kilometers from here is the northern Chinese city of Tianjin, which Bosch plans to turn into a smart city. The Smart Tianjin initiative aims to enhance efficiency and quality of life in the port city, which is home to 15 million people. This smart city project is one of 14 beacon projects worldwide that Bosch is currently spearheading. For smart cities, we offer solutions for energy, buildings, mobility, security, safety, and e-governance.
- **Connected homes:** For the smart kitchen, for example, we offer not just connected household appliances, but also digital services. Our Home Connect ecosystem incorporates a cooking app created by the Kitchen Stories start-up; the app has already been downloaded more than 15 million times. Available in 12 languages, the app contains over 1,000 recipes and uses videos and photos to demonstrate how to prepare them.
- **Connected agriculture:** Located 9,500 kilometers from here, Fazenda Santa Fé is one of Brazil's largest cattle ranches. With the help of Bosch sensors, software, and services, ranchers can monitor things like the weight gain of their livestock. Brazil alone has 100 million head of cattle, Argentina has 50 million, and the U.S. has another 100 million.
- Our customers are already using sensor-based solutions in the cultivation of produce such as tomatoes, strawberries, and asparagus. Bosch technology is even being used in oyster farming – a major industry in Tasmania. Meanwhile, our cloud-based milk monitoring system helps dairies and dairy farmers ensure that their milk doesn't spoil.
- One of the biggest problems in agriculture is plant disease. In Japan, we are employing artificial intelligence (AI) and analyzing sensor data in the Bosch IoT Cloud to predict the risk of disease when growing tomatoes.

- We made further strides in broadening our AI expertise in 2017. In addition to the 300 million euros we're investing in expanding the Bosch Center for Artificial Intelligence's locations in Germany, India, and U.S., we're investing further funds in research into concrete applications in partnerships as well. Bosch is working with the University of Amsterdam, a leader in the field of AI, on the Delta Lab research initiative. In total, 10 million euros are flowing into this partnership and into Cyber Valley, which we operate together with the University of Tübingen and other partners.

Fewer accidents: automated driving is here

- We envision mobility that is without emissions, without stress, and without accidents. Simply making better cars will no longer be enough; we need new conceptions of mobility. To that end, we will automate, electrify, and connect road vehicles.
- Last spring, we premiered our onboard AI computer, which will guide cars through new and complex traffic situations in the future. The computer is capable of up to 30 trillion floating-point operations per second – three times as many as a human brain. Serving as the brain of self-driving cars, the onboard computer will go into production at the beginning of the next decade.
- At the same time, we are working with Daimler to enable fully automated and driverless driving in urban environments – driverless driving meaning vehicles such as robocabs and the driverless delivery of shared vehicles. The first test vehicles will be on the roads as early as sometime in the next few months.
- We also worked with Daimler last summer on realizing driverless parking in the Mercedes-Benz Museum parking garage. The world's first infrastructure-based solution for automated valet parking will go live this year.
- In addition, we have set up a strategic partnership with Baidu in China to collaborate on applying connectivity to transport.
- These projects exemplify how Bosch is driving forward the automation of transport by collaborating with partners who could not be more different – computer companies, automakers, and IT and internet companies.

Less stress: two-wheeler connectivity

- In response to the increasing number of mobility and IoT applications for semiconductors, we are building a new wafer fab in Dresden. Starting in 2021, as many as 700 associates will be producing 300-mm wafers in a facility worth over a billion euros.
- Semiconductors are the core components of all electronic systems, including connected e-bikes. Bosch has electrified the bicycle industry and helped e-bikes achieve a breakthrough. Before that, the sector was largely analog; we now aim to digitalize it further. As a counterpart to our Nyon e-bike computer, we bought the connected biking start-up COBI.Bike in 2017. Its products and technology platform allow cyclists to use their smartphones as navigation, infotainment, and display devices. You can already test Bosch's newly developed ABS for bicycles yourself. It will make cycling much safer.
- Since we launched our COUP e-scooter service in Berlin in 2016, our customers there have been able to use an app to locate and reserve an e-scooter at any time, and then immediately drive it off. Since last summer, users in Paris have been able to head to the Arc de Triomphe on one of COUP's 600 e-scooters in the French capital. Starting this summer, people in Madrid will be able to rent our e-scooters, too. All in all, there are approximately 3,500 COUP scooters on the road, producing zero emissions locally. Within a matter of months, COUP has evolved to become one of the leading e-scooter sharing services.

A realistic goal: a low-emissions, carbon-neutral combustion engine

- This addresses one of the most urgent traffic problems facing cities today: how can goods be transported and people move from A to B without jeopardizing air quality? We are working on answers to this question. Considering environmental requirements and technical potential, we believe a mix of combustion engines and electric vehicles will be on the road for a long time yet.
- As regards diesel, our test vehicles already meet 2020 limits. In addition to that, we are currently working on systems that are comfortably beneath these limits.

- With gasoline engines, too, we want to do our part to protect the environment; hence our focus on particulate emissions. For this reason, as of the middle of last year, in Europe we no longer accept orders in which the engine design does not include a particulate filter.
- We see an alternative path for Bosch in the future: we no longer want to make do with the limits set by lawmakers. We have formulated a clear objective for our engineers: a combustion engine should fundamentally “breathe out” only what it “breathes in.” With the exception of CO₂, emissions should not differ significantly from the ambient air. When powered with synfuels, such engines can even be carbon-neutral.

Lower emissions: market and technological successes in electromobility

- At the same time, we are going full throttle with electromobility. We acquired numerous orders last year, some worth billions of euros. Our customers range from traditional automakers to new players, most of them in Europe and Asia. Our customers benefit from production-tested parts and from our expertise in systems integration.
- A new 48-volt battery for hybrid vehicles will go into production at the end of this year. Market forecasts estimate that some 15 million new vehicles will be partly electrified with 48-volt systems by 2025.
- Combining motor, control unit, charger, display, and app, the 48-volt system is a comprehensive drive system for small and light vehicles – a segment that is seeing strong growth, particularly in Asia. By 2020, some 100 million light electric vehicles will roll off production lines worldwide, many destined for the urban environment. Thanks to our complete, standardized system, established manufacturers and start-ups alike can eliminate long and expensive development processes, as electromobility becomes more affordable for a broader market.
- The same goes for our electric axle, or e-axle. This all-in-one solution integrates an electric motor, power electronics, and transmission in a single system. The e-axle offers tremendous business potential. Starting in 2019, it will be available for installation in hybrids and electric cars, compact cars, SUVs, and even light trucks.

- We are creating the world's first e-axle for heavy trucks in collaboration with the U.S. start-up Nikola Motor Company. Powertrain-wise, the company is also very advanced: as of 2021, the Nikola One und Nikola Two trucks will be powered by hydrogen. Fuel cells in a heavy truck – another world first.
- The Chinese government has also recognized the potential of fuel cells, particularly for commercial vehicles, and has formulated an ambitious strategy for them as part of its current Five-Year Plan. By 2025, it intends to have the necessary infrastructure in place to allow hydrogen vehicles to be launched on the market. To this end, Bosch is partnering with Weichai, the country's biggest truck engine manufacturer, to launch fuel-cell powertrains for commercial vehicles in what is currently the world's largest electromobility market.
- We aim to mirror the momentum in the powertrain sector in our organizational structure. Our new division, Powertrain Solutions, began operations at the start of this year. It pools all our powertrain expertise – diesel, gasoline, and electromobility – in one organization. At more than 60 locations in 25 countries, some 88,000 associates are working together on the powertrain of the future.
- As you can see, whether hydrocarbon fuel or electricity, Bosch is driving the powertrain. In the electromobility business, no automotive supplier is as broadly diversified as Bosch – from bicycles to trucks, we electrify it all.
- As you know, we're currently examining the possibility of manufacturing our own battery cells. By 2030, some 1,000 gigawatt hours of battery capacity will be required worldwide. In order to secure a market share of 20 percent and, with it, a leading position, an investment of some 20 billion euros would be necessary for a manufacturing capacity of 200 gigawatt hours.
- From an entrepreneurial perspective, such a decision needs to be weighed up carefully. Such a move offers opportunities, as well as many risks. After all, it's not just a question of technology; entering into cell production is above all a commercial undertaking that has to make economic sense. Many unknowns as well as technological and especially market developments can only be predicted with difficulty or a high degree of uncertainty, due to the long planning period.

- Today's cell market is primarily divided between five Asian manufacturers. And with future cell technologies as well, it will be the scene of a fierce price war. Established market players have a strong competitive advantage. Since materials costs – including raw materials – are responsible for three-quarters of the value created, there only remains a narrow scope for creating and exploiting competitive advantages.
- On the subject of cell production, there is another factor that will affect our decision. We have to ask ourselves how important it will be for commercial success in the electromobility arena. As I've already pointed out, Bosch is already very well positioned in the electromobility business as it is.
- We expect to be able to let you know our decision within the next few weeks.

The city: a smart living space for six billion people

- Ladies and gentlemen, in about 30 years, two-thirds of the global population – six billion people – will be living in cities. Some conurbations in Africa and Asia will surpass 50 million residents.
- By 2050, urban traffic will nearly quadruple in volume. Cities today already cause 80 percent of all greenhouse-gas emissions and consume 75 percent of the world's energy. Going forward, the quality of life in cities will depend to a large extent on intelligent and connected solutions.
- Between now and 2020, the smart-city market will grow 19 percent each year to reach 700 billion euros. And by 2025, 80 conurbations around the world will be smart cities. In this sector, we can draw on our broad portfolio and cross-domain expertise.
- One key factor for the quality of life in a city is its air quality. That is why Bosch collaborated with Intel to develop Climo, a mobile air lab. No larger than a shoebox, Climo measures 12 air-quality parameters. It can provide information about the concentration of carbon dioxide and even pollen in real time. The data can be used as a basis for managing traffic flows, for instance, or to help residents decide if the air quality is good enough for sports or other activities. The smart lab was recently honored with a CES Innovation Award.

Smart solutions for Industry 4.0

- Bosch's newly formed Connected Industry business unit began operations at the start of January 2018. It brings together the Industry 4.0 activities of various departments and units, especially those in the software and services business. The unit's more than 500 associates will contribute our experience in project realization to an advisory service as well. Marketing our expertise in connecting entire third-party value streams – this, too, is smart. Between now and 2020, we aim to exploit Industry 4.0 to increase sales by more than a billion euros.
- Our stake in the map provider HERE will also serve to further expand our Industry 4.0 activities. Data-based real-time location services can help optimize and automate deliveries of goods and materials. They can also, for example, enable autonomous deliveries within buildings.
- The potential that connected and optimized logistics chains offer for competitiveness is something we have experienced for ourselves, too. We have been able to cut our logistics costs by some 15 percent, a figure in the tens of millions – an achievement that was honored last year with the German Logistics Award.

No digital change without cultural change

- Ladies and gentlemen, I now come to the end of my presentation. We predicted early on that the IoT would change everything. For many, Bosch has become a leader of this exciting – and challenging – trend. We are visionary thinkers, designers, and partners for multiple aspects of the digital transformation.
- Connectivity is not a purely technological issue, however; we realized long ago that it also calls for change in the corporate culture. There can be no digital change without cultural change.
- That's why at Bosch, we are rethinking leadership and collaboration – with a clear impact on our culture of innovation. We're striving for a culture in which associates continuously develop and learn; a culture in which we break down the boundaries between departments and functions; a culture in which it is specialist know-how that counts, and not position or hierarchy. For example, it was not senior management that developed the digital strategy at Bosch Power Tools, but more than 100 internet-savvy associates who volunteered from across the globe.

- In that same division, certain old-established organizational structures have already been transformed into cross-functional teams that all focus on one thing: the customer, in other words, the user of power tools.
- This is merely one of many examples. What else are we doing? Bosch has phased out more than two-thirds of the red tape that is typical for large enterprises. Individual bonuses have been eliminated, cross-functional collaboration is required and actively encouraged, agile teams complement the line organization, start-ups find unconventional ways to make new ideas a success, and we are creating new campus-like working and office spaces at many locations. One good example of this is our new IoT campus in Berlin, which we officially opened ten days ago. We are also converting our headquarters into a campus whose architecture and outdoor spaces represent openness, creativity, and collaboration. This means our corporate headquarters at Schillerhöhe in Gerlingen, near Stuttgart, will itself be a symbol of this cultural change.
- We are moving this change forward with a team of people who have continuous improvement firmly anchored in their DNA. After all, Bosch has stood for both continuity and change since the day it was founded.
- One thing is clear: the foundation of our success is the expertise of our associates. That's why we invest in the further training of our workforce – an investment that has amounted to more than one billion euros over the past five years alone. This includes offerings that relate specifically to connectivity and electrification, such as training to become a software expert or an electromobility boot camp.
- The clear message of this review and forecast is that our people are working across all business sectors to implement our strategy. We are continuing to further our existing business as we tap into new business areas, and will remain technology leaders.
- Ladies and gentlemen, thank you very much. My colleagues and I look forward to speaking with you.



Mehr Raum für Querdenker Bosch Start-ups bekommen eine neue Heimat

19. März 2018
PI9998 RB Cwi/KB

- ▶ Robert Bosch Start-up GmbH zieht in 5 000 Quadratmeter große, ehemalige Fabrikhalle
- ▶ Arbeitsräume von Künstlern gestaltet
- ▶ Kreative Umgebung fördert innovative Geschäftsideen

Ludwigsburg – Um einen Eindruck von den neuen Räumlichkeiten der Robert Bosch Start-up GmbH in Ludwigsburg zu bekommen, sollte man sich Zeit nehmen. Es gibt vieles zu entdecken: Sessel im Retro-Design laden zum Verweilen ein, Perserteppiche schaffen eine Wohnzimmeratmosphäre und bunte Metallkonstruktionen sorgen gleichzeitig dafür, dass es nicht allzu gemütlich wird. Schließlich wird hier gearbeitet. Keiner der sechs unkonventionell gestalteten Arbeitsräume gleicht dem anderen. Wer zum Beispiel schon immer mal eine Team-Besprechung in einer norwegischen Holzhütte abhalten wollte, der kann das hier tun. Doch warum das Ganze? „Um auf völlig neue Ideen zu kommen und sie umzusetzen, braucht man eine Umgebung, die sich von normalen Büroräumen unterscheidet“, sagt Peter Guse, Leiter der Robert Bosch Start-up GmbH. Möglichst unterschiedliche Impulse sollen den 250 Mitarbeitern, die hier künftig arbeiten werden, dabei helfen ihr Ziel zu erreichen: Dinge völlig neu zu denken. Rund drei Millionen Euro investiert Bosch in die neuen Räumlichkeiten.

Aus Mitarbeitern werden Unternehmer

Mit dem Ziel, den Unternehmergeist in den eigenen Reihen zu fördern und neues Geschäft in neuen Märkten zu finden, sind Guse und sein Team Ende 2013 gestartet. Und dieses Ziel verfolgen sie noch immer. Produkte und Dienstleistungen sollen schneller auf den Markt gebracht werden als das in einem großen Unternehmen möglich ist. Ein Beispiel sind die [Sensorlösungen](#), mit denen das Bosch-Start-up Deepfield Connect Landwirten die Arbeit erleichtert. „Bei uns beschleunigen flache Hierarchien und kurze Wege die Abläufe“, sagt Guse. Eine kreative Arbeitsumgebung schaffe ideale Rahmenbedingungen. Deshalb waren Künstler am Werk in der alten Fabrikhalle, die künftig die Heimat der Robert Bosch Start-up GmbH ist.

Aus unterschiedlichsten Arbeitsmaterialien, die auch aus Bosch-Werken stammen, haben sie im engen Austausch mit den Mitarbeitern neue Arbeitswelten geschaffen. 5 000 Quadratmeter stehen Start-up-Mitarbeitern hier zur Verfügung. Freiraum für Querdenker, die aus einer innovativen Idee Neugeschäft für Bosch und begeisterte [Produkte](#) entwickeln wollen. „Wir unterstützen unsere Teams auf diesem Weg nicht nur räumlich. Wir sind kritische Partner bei allem, was zu einer erfolgreichen Geschäftsentwicklung gehört, von Personalbetreuung über Finanzen sowie den Business-Plan bis hin zu Rechtsfragen und Marketing“, erklärt Guse. So werden aus Mitarbeitern Unternehmer. Neben den unternehmenseigenen Start-ups arbeiten künftig auch Innovations-Teams aus Bosch-Geschäftsbereichen in den neuen Räumlichkeiten. Peter Guse und sein Team von der Robert Bosch Start-up GmbH werden auch sie dabei unterstützen, aus guten Ideen innovative Produkte und Dienstleistungen entstehen zu lassen.

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Journalistenkontakt:

Christiane Wild-Raidt,

Telefon: +49 711 811-6283

Die Bosch-Gruppe ist ein international führendes Technologie- und Dienstleistungsunternehmen mit weltweit rund 400 500 Mitarbeitern (Stand: 31.12.2017). Sie erwirtschaftete im Geschäftsjahr 2017 nach vorläufigen Zahlen einen Umsatz von 78 Milliarden Euro. Die Aktivitäten gliedern sich in die vier Unternehmensbereiche Mobility Solutions, Industrial Technology, Consumer Goods sowie Energy and Building Technology. Als führender Anbieter im Internet der Dinge (IoT) bietet Bosch innovative Lösungen für Smart Home, Smart City, Connected Mobility und Industrie 4.0. Mit seiner Kompetenz in Sensorik, Software und Services sowie der eigenen IoT Cloud ist das Unternehmen in der Lage, seinen Kunden vernetzte und domänenübergreifende Lösungen aus einer Hand anzubieten. Strategisches Ziel der Bosch-Gruppe sind Lösungen für das vernetzte Leben. Mit innovativen und begeisternden Produkten und Dienstleistungen verbessert Bosch weltweit die Lebensqualität der Menschen. Bosch bietet „Technik fürs Leben“. Die Bosch-Gruppe umfasst die Robert Bosch GmbH und ihre rund 450 Tochter- und Regionalgesellschaften in rund 60 Ländern. Inklusive Handels- und Dienstleistungspartnern erstreckt sich der weltweite Fertigungs-, Entwicklungs- und Vertriebsverbund von Bosch über fast alle Länder der Welt. Basis für künftiges Wachstum ist die Innovationskraft des Unternehmens. Bosch beschäftigt weltweit 62 500 Mitarbeiter in Forschung und Entwicklung an 125 Standorten.

Das Unternehmen wurde 1886 als „Werkstätte für Feinmechanik und Elektrotechnik“ von Robert Bosch (1861–1942) in Stuttgart gegründet. Die gesellschaftsrechtliche Struktur der Robert Bosch GmbH sichert die unternehmerische Selbstständigkeit der Bosch-Gruppe. Sie ermöglicht dem Unternehmen langfristig zu planen und in bedeutende Vorleistungen für die Zukunft zu investieren. Die Kapitalanteile der Robert Bosch GmbH liegen zu 92 Prozent bei der gemeinnützigen Robert Bosch Stiftung GmbH. Die Stimmrechte hält mehrheitlich die Robert Bosch Industrietreuhand KG; sie übt die unternehmerische Gesellschafterfunktion aus. Die übrigen Anteile liegen bei der Familie Bosch und der Robert Bosch GmbH.

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