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## **Bosch makes factories smart, lean, and flexible** Hannover Messe 2018 (hall 17, booth A40)

April 23, 2018

PI 10610 RB DH/KB

- ▶ New plant: Bosch to invest 100 million euros in a smart factory in Mexico
- ▶ New strategy: Bosch Rexroth increases sales to 5.5 billion euros
- ▶ New name: Bosch pools software and services for manufacturing and logistics under the name Nexeed

Stuttgart and Hannover, Germany – The only fixed elements are the floor, the walls, and the roof. Everything else is movable and connected. Machines drive in and out as needed, assembly lines grow longer or shorter, autonomous transport robots deliver components to workers. Robots work directly with human colleagues, relieving them of dangerous or strenuous tasks. Power is transmitted wirelessly via induction loops in the factory floor. Workers, machines, and components are connected via intelligent software systems and mobile devices. An ultrafast 5G wireless network enables real-time data exchange, while artificial intelligence improves product quality through early fault detection. This reduces the burden on workers, leaving them with more time for other tasks, such as programming algorithms, developing new business models, or taking on other creative tasks. That is how Bosch imagines future factories will be. At Hannover Messe, in line with the slogan “Factory of the future. Now. Next. Beyond,” Bosch will be presenting what the company already offers (now) for connected factories, what solutions will soon be ready (next), and what it is developing for the future (beyond).

### **People, machines, and data: the three pillars of success in the connected factory**

Bringing connectivity to existing factories and equipment is also critical to the success of Industry 4.0. On 1,300 square meters of floor space at Hannover Messe, Bosch is showcasing both aspects: the smart, lean, and flexible factory of the future as well as connected solutions that are already in operation today in manufacturing and logistics. Both scenarios have something in common: the interplay of hardware, software, and services – orchestrated by people. “The

three pillars of success in the factory of the future are people, machines, and data,” said Dr. Stefan Hartung, the Bosch board of management member whose responsibilities include the Industrial Technology business sector.

### **Steady sales growth with Industry 4.0**

Connected solutions helped Bosch increase its sales of industrial technology by 7.7 percent to 6.7 billion euros in 2017. “Our portfolio of solutions for manufacturing and logistics is constantly growing, which means we can gradually turn our vision of a completely connected value stream into reality,” Hartung said. The establishment in 2018 of the Bosch Connected Industry operating unit with 500 associates, plus the new Nexeed software portfolio, underline the importance of connectivity to Bosch. “We are getting closer and closer to achieving our aim of exploiting Industry 4.0 to increase overall sales by more than a billion euros by 2020,” Hartung said. Outstanding results from Bosch Rexroth are also helping reach this milestone, with the drive and control technology specialist generating sales of 5.5 billion euros in 2017 – a year-on-year increase of 10.4 percent. Its strategic realignment in recent years has helped Bosch Rexroth improve its competitiveness and gain market share.

### **New smart plants in Mexico and China**

In addition, Bosch is investing heavily in Mexico, this year’s partner country at Hannover Messe: the company is spending some 100 million euros on a smart plant for electronic components in Celaya, central Mexico, which will be completed by 2019. Covering 21,000 square meters, the plant will manufacture engine control units for the Mexican and U.S. markets. Bosch is looking to create more than 1,200 jobs at the new location. “Industry 4.0 improves business processes and delivers higher productivity. That means we’re creating jobs, too,” Hartung said. Bosch is also planning an Industry 4.0 reference factory in China. A plant for control systems and linear motion technology is being built up step by step in the city of Xian. By 2020, it will be digitally equipped with new manufacturing processes – and visitors to the trade fair will have a chance to see what these processes might look like.

### **Robots generate more jobs**

Hartung also stressed the importance of robotics, adding that a recent study shows it has driven an increase in jobs so far in Germany. Economists at the Center for European Economic Research (ZEW) predict that employment will grow by 0.4 percent per year until 2021. The study reports that while robots are replacing some jobs, this is more than compensated for by job growth elsewhere. “In the Industry 4.0 era, people are as indispensable as ever,” Hartung said. When it comes to complex tasks or quality control, robots can provide specific support. Robots as colleagues – that is the message behind the Pixar-style 3D

avatars that visitors will see at the center of the Bosch booth. Standing 1.5 meters tall, they move around on the virtual factory stage. The APAS mobile production robot, for instance, works closely with human colleagues without coming into physical contact with them. Meanwhile, the ActiveCockpit intelligent communications platform keeps production workers permanently up to date on the status of operations, while an autonomous transport robot not only carries parts from A to B but also works on them en route.

### **Machines teach themselves new skills**

What makes this so exciting is that all these avatars are mock-ups of market-ready applications or pilot projects. “We are already helping our customers optimize the management of their production lines and plants,” said Rolf Najork, the managing director of Bosch Rexroth AG. “But in the future, there will be even greater demand for flexibility, transparency, and speed.” Artificial intelligence (AI) will play a central role in this. Engineers have found a fun way to demonstrate what AI is capable of in an industrial setting: KI-cker (KI is the German abbreviation for artificial intelligence) is a take on foosball where the intelligent interplay of drive and control technology with artificial intelligence gradually turns the goalkeeper and the field players into talented soccer pros. KI-cker is built around a neural network that constantly learns from its playing experience. This is how machines will teach themselves new skills in the future. By way of examples, they can learn by themselves how to identify defects and faults – thereby continuously improving their performance.

### **Nexeed brings connectivity to manufacturing and logistics**

Hardware applications need innovative software solutions running in the background to provide the necessary connectivity. At Hannover Messe, Bosch is presenting its new Nexeed software portfolio, which encompasses software and services for the entire value stream. “The factory of the future will get its intelligence from software – and from the brains of its workforce,” said Dr. Stefan Aßmann, who heads up Bosch Connected Industry. Bosch has systematically taken the comprehensive domain knowledge from its more than 270 plants and transformed it into software solutions. “Specialists in manufacturing, logistics, and software have worked together to create solutions that both simplify workers’ daily routines and make manufacturing and logistics more efficient, flexible, and eco-friendly.”

### **Stay on top of goods’ location and condition**

The Nexeed Production Performance Manager ensures systematic improvements in production by helping quality and maintenance operatives make decisions quickly and easily. To do so, it gathers and harmonizes real-time production and machine data from a variety of sources in the manufacturing

environment, gives it a clear structure, and presents it to workers on their mobile devices. This saves both time and money. Nexeed Track & Trace is a solution for monitoring the flow of goods. Sensors fitted to the goods themselves autonomously report their position and condition via the cellular network to the cloud. This means logisticians can trace each product and each carrier. It also means users can call up the precise delivery time and optimize their material and capacity planning. That, too, saves both time and money.

### **Contact person for press inquiries**

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## **Bosch puts a face to the connected factory** Hannover Messe 2018 (hall 17, booth A40)

23 April 2018

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- ▶ 1.5 meter tall 3D avatars represent the Factory of the Future
- ▶ Smart soccer table teaches itself with artificial intelligence
- ▶ New portfolio pools software and services for the connected value stream

Stuttgart and Hannover, Germany – According to the slogan “Factory of the future. Now. Next. Beyond”, the Bosch Group is presenting at Hannover Messe what the company already offers (now) for connected factories, what solutions will soon be available (next) and what it is developing for the future (beyond). Despite all connectivity and automation, humans and their creativity are indispensable in the Industry 4.0 era. Robots support them with complex and time-consuming tasks like data processing and quality control. This is also the message of 1.5 meter tall, Pixar-style 3D avatars. They take centre stage in Hannover and move around the virtual factory. All avatars are mock-ups of market-ready applications or pilot projects. Allow us to introduce them:

### **ActiveCockpit – the Data Collector**

The intelligent communication platform [ActiveCockpit](#) from Bosch Rexroth visualizes data to make it easy to understand for everyone. Its gigantic screen informs employees about the production status by processing and visualizing production data in real time. As a result, manufacturing becomes more transparent, while faster information processing enables clear analyses and efficient procedures. Users and companies both benefit from the immediate identification of problems. This reduces downtimes and avoids potential recall costs; the quality level increases.

### **IoT Gateway – the Personal Trainer**

Despite the Industry 4.0 hype, some companies have not yet arrived in the digital age. The machines lack sensors, software or the connection to enterprise IT systems – and hence important prerequisites for the connected factory. The Rexroth [IoT Gateway](#) can quickly and easily connect both old and new machines for Industry 4.0. The IoT Gateway unites sensors, software and IoT-compatible industrial controls, making it possible to detect the condition of machines. Even

operators of older machines can reap the benefits of the connected industry without large investments.

### **APAS assistant – the Team Player**

Humans are key players in the factory of the future: creative intelligence is in the employees' minds. They are supported by digital devices and robots. The collaborative production assistant [APAS assistant](#), for instance, supports employees with monotonous and ergonomically challenging tasks – without a safety fence. This human-robot collaboration is made possible by an intelligent safety concept. Thanks to its sensor skin, the APAS assistant recognizes its human colleagues without touching them and stops before a collision happens. Once the employee has left the immediate vicinity, the robot independently resumes its work exactly where it stopped before. This interaction of human and machine leads to higher efficiency, and sustainable optimization of the overall productivity, since employees can concentrate on more complex tasks.

### **ActiveShuttle – the Delivery Guy**

Robots also support with internal transport processes. They drive through the factory and, for instance, transport material cases from storage to the production station. With the ActiveShuttle, Bosch Rexroth presents a concept for an intelligent, driverless transport system that automates the internal flow of material and goods. The integrated lifting platform automatically unloads goods in the logistics and manufacturing areas. Cyclical transport or a consumption-based material supply can also be realized with ActiveShuttle.

### **XDK – the Messenger**

The universally programmable IoT multisensor [XDK](#) (Cross Domain Development Kit) is the “midwife“ for companies, who want to develop their own applications quickly and flexibly. In a compact box, the XDK combines a variety of MEMS sensors, for instance to measure acceleration, rotation angle, humidity, air pressure or temperature, with a powerful processor for the analysis, processing and transmission of the sensor data. Be it for predictive maintenance, monitoring or retrofitting: the XDK can be deployed universally; the programming language XDK Mita facilitates programming.

## **Apart from the avatars, Bosch is exhibiting the following highlights:**

### **Foosball: learning by playing thanks to artificial intelligence**

Table soccer has to be learned. To do so, we absorb and digest information with our senses, in this case the eyes. With the help of our brain, we learn systematically how to hold, play or pass the ball with the right force at the right time. Artificial intelligence (AI) works according to the same principle: instead of the brain, software processes the information with algorithms; cameras and sensors replace our senses. The soccer table, also called foosball or KI-cker (KI is the German abbreviation for artificial intelligence), teaches itself and optimizes its soccer abilities with every new co-player. Industrial applications such as robots or autonomous vehicles can also learn numerous tasks and optimize their performance thanks to AI. Their biggest advantage: even after the umpteenth try, they will not be frustrated.

### **Smart Cab for connected farming**

[Smart Cab](#), co-developed by Bosch as a member of the CAB concept cluster, turns agricultural vehicles into connected control centres in the field. All components – vehicles, cameras and drones alike – can interact with each other. Via the cloud, camera drones send detailed pictures of the condition of crops to the driver's cab, and operators are warned by the object recognition camera about living obstacles such as deer. Vehicle users can download specific functions from a feature store over the air directly to the machines. Depending on the weather or soil conditions, for example, the nozzle settings can be adjusted.

### **Nexeed – new Industry 4.0 software for production and logistics**

#### **Connecting the entire value stream**

Hardware applications need innovative software solutions running in the background to provide the necessary connectivity. At Hannover Messe, Bosch is presenting its Nexeed new software portfolio, which pools Bosch software and services for production and logistics. The [Nexeed](#) solutions make day-to-day work easier for employees and optimize production and logistics processes in terms of transparency, agility, cost, quality and time. The portfolio ranges from the sensor, over machine automation to the cloud. Nexeed solutions can be combined to connect individual lines, entire plants and plant networks, as well as their intralogistics and external goods flow.

### **Systematic production improvement**

The Nexeed Production Performance Manager, for example, ensures systematic improvement of production by helping employees with decision making. For this purpose, the software collects and harmonizes production and machine data from many different sources and “translates” them into a common language. Subject-specific functions like the Ticket Manager, which was developed for the lighting company Osram, make it possible for the employees to complete their tasks faster and more purposeful. Using an app, employees are informed about the status of their more than 80 connected machines at all times. Upcoming tasks such as maintenance work or subsequent material deliveries are displayed, evaluated and assigned to the employee with the appropriate qualification.

### **Opening the data treasure chest with Data Analytics**

The production process produces a large quantity of data of various types – the most important raw material of Industry 4.0. With Nexeed Data Analytics, this data can be used intelligently to identify new optimization potential. Customers do not have to deal with Data Analytics themselves; this task is entirely up to the Bosch experts. They gain important insights from product, process and machine data, which can be used to achieve improvements regarding quality, cost and delivery performance. Customers receive an individual service from the first data analysis to comprehensive prediction models.

### **Intralogistics en route to the digital age**

Compared to modern production, the intralogistics sector is lagging behind regarding connectivity. Nexeed Intralogistics Execution deals with the three big challenges: keeping an eye on the vehicle fleet, optimizing material storage and designing transport routes dynamically. Information on all intralogistics processes are available in real-time. By unifying relevant data from different sources – for example RFID in the internal supermarket, forklift localisation and inventory information – the solution not only helps logistics specialist with the daily work, but also allows long-term planning.

### **Seamless transparency throughout the supply chain**

These days frequent travellers can easily share information about their whereabouts. With Nexeed Track and Trace, Bosch has developed a logistics solution that enables the freight to record a digital travel diary. The software not only shares the current location, but also regularly sends information about temperature, vibration and humidity to the cloud via wireless sensors and gateways. This way, supply chains can be traced and permanently optimized. The international freight forwarding and logistics company Panalpina makes use of these benefits. They use Nexeed Track and Trace for a transparent supply chain – not only on the road, but also in the air. On the first test route between

Germany and the recipient plant in the U.S, each package was equipped with a sensor. It records regularly relevant parameters such as vibrations. At each gateway, for instance when unloading the truck at the terminal or loading the airplane on the runway, data and the location of the time-sensitive goods are transmitted to the cloud. The Panalpina sees whether the goods have been loaded into the airplane and how they are doing.

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## **Manufacturing hub Mexico: Bosch to build smart factory for electronic components**

### New investment in the HANNOVER MESSE 2018 partner country

April 17, 2018

PI 10467 RB Gri/KB

- ▶ Investment of 100 million euros (120 million U.S. dollars) in new plant in central Mexico
- ▶ Highly modern Industry 4.0 plant to manufacture key components for connected mobility
- ▶ More than 1,200 new jobs over the next few years
- ▶ Strengthening local presence in North America
- ▶ HANNOVER MESSE 2018: Bosch showcases factory of the future today

Mexico City, Mexico, and Stuttgart, Germany – Bosch, a leading global provider of technology and services, is investing 100 million euros (120 million U.S. dollars) in a new plant in Celaya. The company plans to build a new smart factory for electronic components in the central Mexican city by 2020. The investment underlines the importance of this year's HANNOVER MESSE partner country for the company: “Bosch is committed to Mexico. The country is and will remain an important market and a hub for our global manufacturing and development network,” said Stefan Hartung, member of the Bosch board of management, ahead of the international industrial trade fair. The goal is to create more than 1,200 additional jobs at the new location in Celaya in the coming years. In total, the Bosch Group employs around 16,000 associates and is active with all four of its business divisions in Mexico. In 2016, the company generated sales of 1.1 billion euros in the country [*N.B. 2017 figures will be published in May 2018*].

### **Industry 4.0 as a competitive advantage in Mexico**

The Latin American emerging market has become highly industrialized in recent years, driven mainly by the automotive industry. In 2017 alone, nearly 3.8 million vehicles were manufactured in Mexico. In order to increase efficiency and competitiveness as a leading global manufacturing location, Mexico is increasingly focusing on the use of Industry 4.0. Bosch is playing a part in this. “We are planning

to make the new manufacturing facility in Celaya a smart factory with state-of-the-art, intelligent production lines,” Hartung said. For example, the plant will employ a manufacturing execution system (MES), which automatically collects data and shares production information in real time. This makes possible both preventive maintenance of machinery and higher product quality. The system also digitally connects the plant to the Bosch Group’s global manufacturing network. “By mid-2019, manufacturing at nearly all Bosch plants in Mexico will be equipped with our intelligent control system,” said René Schlegel, president of the Bosch Group in Mexico. In total, Bosch currently operates ten manufacturing locations around the country and has already introduced the use of smart technologies, for example at its Mobility Solutions sites in Toluca and Juárez. As a leading provider of Industry 4.0 solutions, the Bosch Group also sees local business opportunities in Mexico.

### **Increasing demand for connected mobility**

The new approximately 21,000-square-meter facility in Celaya, which is located in the state of Guanajuato, will manufacture electronic control units (ECUs) for the American market. These are key components for connected mobility. Alongside Juárez, Celaya will be home to the Automotive Electronics division’s second plant in Mexico. “With the new location, we are responding to the increasing demand for electronic components in the American market,” René Schlegel said. With a total surface area of 170,000 square meters, the site will have capacity for further expansion in the future. In addition, the plan is to build a logistics center for Mexico on the adjacent property, which will also serve as a warehouse for the new plant.

### **Bosch strengthens presence in North America**

With the investment in a new location, Bosch is continuing its long-term expansion in North America. Over the past five years, a total of around 2.6 billion euros has been spent on strengthening the company’s local presence. In Mexico, where Bosch has been active since 1955, the company opened a new manufacturing facility for driving safety systems in Aguascalientes in 2016. At the end of 2017, a plant for steering systems in Querétaro went into operation. The country is also gaining in significance as a development location: since 2014, Bosch has been operating a center for software development and engineering services for the American market in Guadalajara. A large proportion of the investment sum also went to the U.S. There, the Mobility Solutions plants in Charleston and Anderson are currently being expanded, and at the beginning of this month, Bosch opened a new research center in Sunnyvale in California’s Silicon Valley.

## **Bosch at HANNOVER MESSE: the factory of the future – today!**

What will the factory of the future look like? How can people, robots, and machines work together? What role do 5G, data, software, and services play? Where can artificial intelligence (AI) be put to use? At Hannover Messe 2018 (hall 17, booth A40), Bosch is bringing the factory of the future to life – today. Entitled “Now, next, beyond: factory of the future,” the technology company’s 1,300-square-meter showcase demonstrates what it offers today (now), and what solutions it is developing for tomorrow (next) and the future (beyond). The main attractions are 1.5-meter-tall mobile robotic figures that give a Pixar-like face to Bosch’s connected-factory assistants. Another highlight is a football table that improves its soccer abilities with every game and every new opponent – thanks to AI.

### **[Press briefing and short guided tour of highlights:](#)**

**[Monday, April 23, 2018, 1:00–2:00 p.m., hall 17, booth A40](#)**

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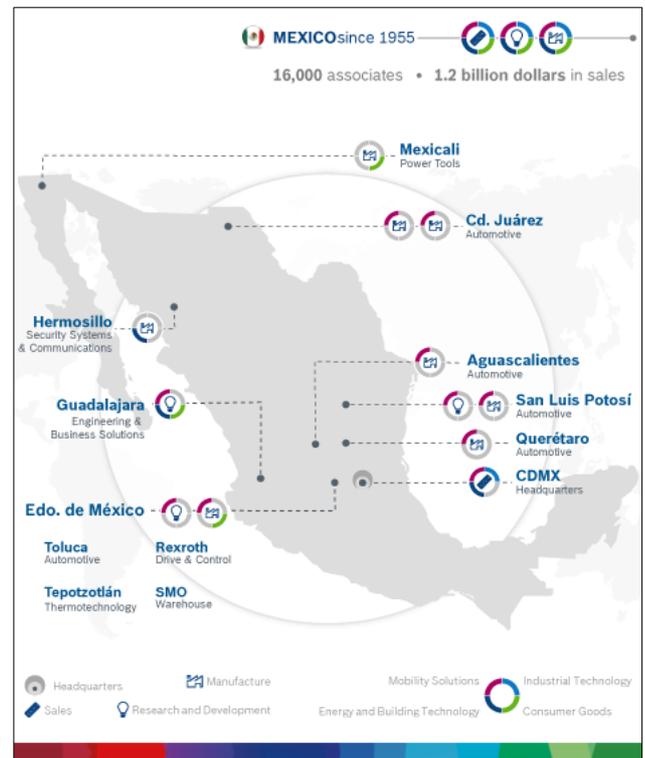
# Fact sheet

## Bosch in Mexico

February 2018

### Important location for the global network of the Bosch Group

- Bosch has been active in Mexico since more than 60 years (1955) in Mexico. Today, it is present with all of its four business sectors.
- At ten locations (Aguascalientes, Guadalajara, Hermosillo, Juarez, Mexicali, Mexico City, Querétaro, San Luis Potosí, Tepotzotlán, Toluca), Bosch employs 16,000 associates in Mexico – more than double than in the beginning of the decade.
- In 2016, Bosch generated sales of 1.1 million euros (1.2 billion US-Dollars) in Mexico and achieved a significant double-digit growth compared to the previous year. In 2017, business also developed well (sales figures will be communicated in May 2018).
- Mexico is an attractive market already today and remains an important location in the Bosch Group's global manufacturing and research network.
- In Mexico, Bosch is developing and manufacturing both, for the local market as well as the Americas region. The company produces for example hydraulic systems, power tools, security systems as well as mobility solutions such as steering systems and driver assistance systems like ABS and ESP.
- As a leading user of Industry 4.0 Bosch is also using connected solutions at its Mexican manufacturing plants to increase efficiency, e.g. Juarez and Toluca. The company also offers a wide spectrum of solutions in the areas of drive and automation technology as well as sensors and software for the Mexican manufacturing industry.
- Mexico is also becoming an increasingly important development location for the Bosch Group. In 2014, the company opened its first software engineering center for the Americas in the Mexican city of Guadalajara.
- Bosch's focuses on a strong localization strategy in Mexico: this includes local engineering, manufacturing as well as a high share of local supply.



## Dual education at Bosch in Mexico

- The dual education system has a long tradition at Bosch: Robert Bosch set up the first occupational training department at his company in 1913. Today, the supplier of technology and services is training some 7,300 apprentices in more than 30 countries – with nearly 2,500 of these apprentices based outside Germany.
- Vocational competence development is part of the localization strategy of the Bosch Group.
- In Mexico, too, the demand for qualified professionals is high. More than 150 apprentices are currently being trained at three Technical Training Centers (Centro de Capacitación Técnica) at Bosch in San Luis Potosí, Toluca and Juarez.
- The training center in San Luis Potosí opened in 2001 and celebrated its 15<sup>th</sup> anniversary in 2016. This made Bosch the first - and for a long time the only – company to offer dual training in Mexico. Meanwhile, the model is also used by other companies and is now officially recognized by the Mexican government. Based on the dual system, the center, in collaboration with the San Luis Potosí University of Technology (Universidad Tecnológica de SLP), offers a three-year training in mechatronics with a focus on flexible manufacturing. In addition to technology, subjects such as corporate governance, communication, teamwork, the Bosch Production System (BPS) and quality standards are part of the curriculum.
- Connected manufacturing requires new skills among skilled workers and trainees. The current dual training program therefore also includes topics in the fields of automation, robotics, IoT and Industry 4.0 in Mexico.
- Both training and exam requirements comply with the German standard. The training centers are IHK / AHK certified.
- Since autumn 2017, Bosch also offers apprenticeships for industrial business management for the first time.



## Market with potential

- With more than 120 million inhabitants, Mexico is an attractive market.
- Mexico is the 15th largest economy in the world and has a similar importance in international trade.
- Mexico is the country with the most free trade agreements worldwide.
- In 2016, Mexico was the world's eighth largest market for machinery and equipment with a volume of more than 27 billion euros.
- Mexico is the seventh largest car manufacturer and the fourth largest exporting nation in the global automotive industry.
- In view of the country's current health profile, this market offers increasing potential. Furthermore, Mexico's food processing industry is the tenth largest worldwide.



## Connected Manufacturing Quotes Bosch Management

April 23, 2018  
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### **Dr. Stefan Hartung, Member of the Board of Management Robert Bosch GmbH**

- “The three pillars of success in the factory of the future are people, machines, and data.”
- “We are getting closer and closer to achieving our aim of exploiting Industry 4.0 to increase overall sales by more than a billion euros by 2020.”
- “Industry 4.0 improves business processes and delivers higher productivity. That means we’re creating jobs, too.”
- “In the Industry 4.0 era, people are as indispensable as ever.”

### **Rolf Najork, Chairman of the Executive Board of Bosch Rexroth AG:**

- „In the factory of the future the only fixed elements are the floor, the walls and the roof. Everything else is flexible and movable.“
- “We have to think far more radically. Manufacturing companies need to become even more flexible and faster. Our concept for the factory of the future envisages machinery that keeps on reconfiguring itself flexibly to match the order situation.”
- “Bosch Rexroth’s development shows that we’re on the right track with our strategic realignment and expansion of our activities in the field of Industry 4.0.”

### **Dr. Stefan Aßmann, Head of Bosch Connected Industry:**

- “The factory of the future will get its intelligence from software – and from the brains of its workforce.”
- “Specialists in manufacturing, logistics, and software have worked together to create solutions that both simplify workers’ daily routines and make manufacturing and logistics more efficient, flexible, and eco-friendly.”

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*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 440 subsidiaries and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. 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](http://www.bosch.com), [iot.bosch.com](http://iot.bosch.com), [www.bosch-press.com](http://www.bosch-press.com), [twitter.com/BoschPresse](https://twitter.com/BoschPresse).*