Invented for life

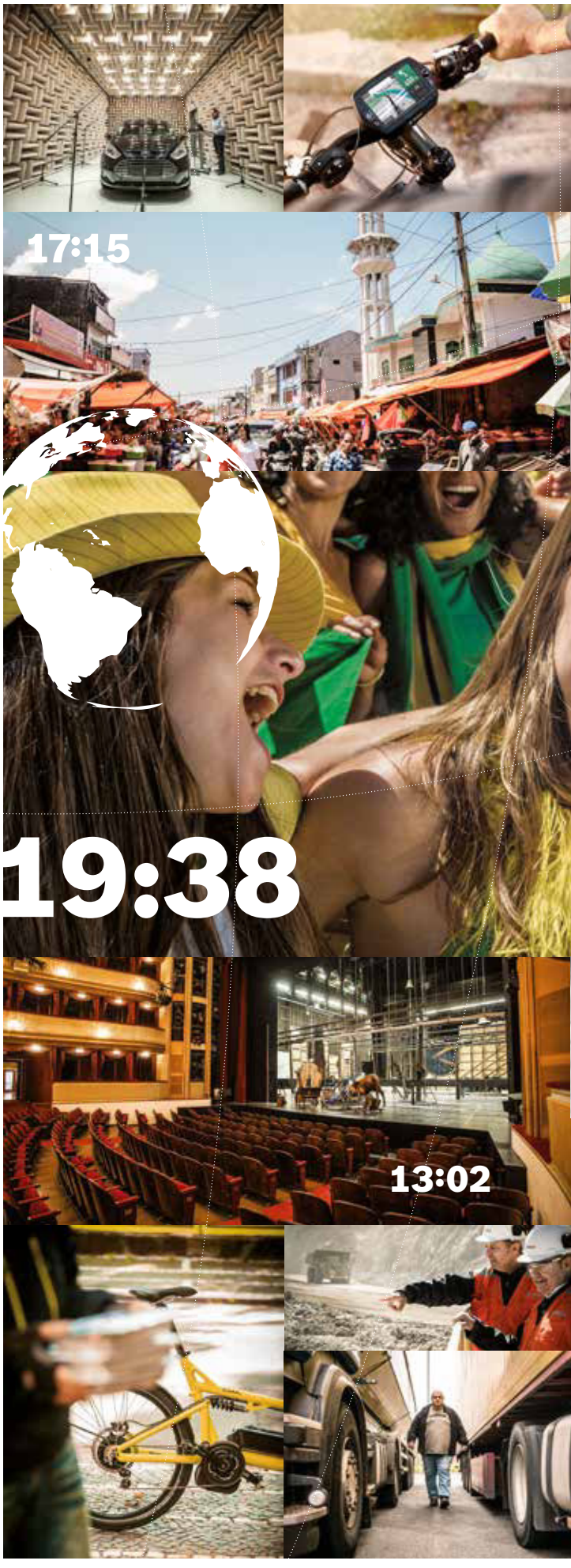
Annual Report **2013** – Magazine

BOSCH
Invented for life

24 hours

What do we mean by “Invented for life”?
Come with us on a journey to myriad destinations, each of which illustrates a different answer to this question. Over the course of 24 hours, we meet men and women who use or develop products and services for the benefit of millions of people worldwide. Most people have no idea how many times each day they come into contact, directly and indirectly, with Bosch Group technology. Mobility, security, heat, and food – these are just a few of the many areas in which we’re active.

Day for day and hour for hour, people and technology work in symbiosis to create tangible benefit. This happens at many different points across the globe. Join us for a glimpse behind the scenes, and share the enthusiasm of nearly 300,000 Bosch associates united in the pursuit of a common goal: to come up with technology that, in improving quality of life, is “Invented for life.”



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01

Protecting hand and driving force
Versatile technology for everyday life

Bosch is driving growth in Brazil

Sun, samba, carnival – these are the clichés, but Brazil is also so much more. South America's largest country is experiencing remarkably dynamic growth. And for millions of Brazilians, Bosch is an everyday presence in vital areas such as transportation, security, and energy supply.

Goooooooooooal! The TV commentator's seemingly endless cry unleashes a wave of jubilation across the country. The *seleção*, as the national team is called, has just scored another goal. When the ball hits the back of the net, there's no holding the fans back. Their exuberance reaches fever pitch. Many offer thanks to the heavens: Brazil has taken the lead, which must be divinely ordained. From the Amazon to Porto Alegre, nothing arouses emotions like soccer. For a brief moment, millions of people's everyday worries are forgotten.

Ailton de Jesus Perqueira, however, doesn't get caught up in all the excitement, at least not while he's on duty. In the security control room at the Arena Itaipava Fonte Nova in Salvador da Bahia, he only has eyes for his monitors. At moments like these, when emotions are running high, it takes his full concentration to catch critical situations in time. "It does happen, especially in a teeming crowd, that someone doesn't feel well and needs a doctor," he says, demonstrating how he can zoom in on an individual seat. This helps the paramedics figure out where they need to go quickly. The arena is home to the top-league club Bahia, which means it was designed to handle large-scale events.

There was an old stadium located on the same spot, but it was torn down in 2008. "Here in the newly-built arena, we've installed 280 cameras, 500 loudspeakers, and 4,000 fire alarms," says Rodrigo Alexsandre Elias, the head engineer, detailing the safety systems. "We can evacuate the 50,000-seat stadium within just eight minutes," he adds. The sports facility has been using technology from the Bosch Security Systems division ever since its inauguration in March 2013. "The Bosch systems worked perfectly from day one. And they're highly compatible with the other equipment in the stadium," Rodrigo Elias says. The venue also features Bosch thermotechnology in the form of 21 solar thermal collectors and two heat pumps.

"I've never seen anything like this," his colleague Ailton de Jesus Perqueira adds enthusiastically. "We can get pictures of isolated events both live and with a time delay. A number of hooligans looking to vent their aggression on the new stadium have since found this out to their cost," the watchman with hundreds of camera "eyes" says with a grin. During the games, security staff also sit in the control room, ready to direct their colleagues straight to the troublemakers. The new technology has even given the security experts in the control room a psychological trick they can use to quell a brawl: "We capture what's happening on camera and project the situation onto the big screens in the stadium," Perqueira explains. That way, everyone can see who is getting into a fight. "That often embarrasses the people involved so badly that it stops them in their tracks," he says with a laugh.

Pure emotion: for Brazilians, soccer is more than just a sport. It's the elixir of life and allows many to briefly forget their everyday worries.

19:38

Brazil, São Paulo

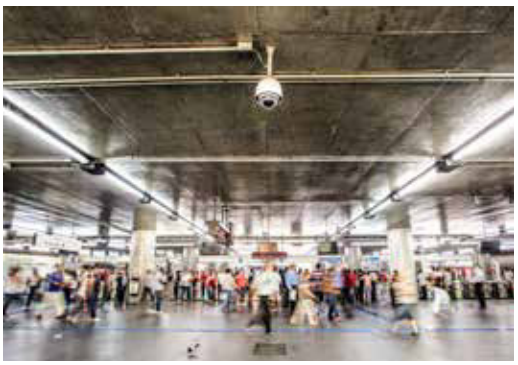
Official language	Portuguese
Capital	Brasília
Area	8,514,215 km²
Population	192.4 million

UTC: coordinated universal time

Keeping an eye on everything: São Paulo's metro records the fewest incidents per million passengers.

"The Bosch systems worked perfectly from day one."

Rodrigo Alexsandre Elias



900,000 people pass through the central Sé station every day.

Five million passengers daily

For Laurindo Junqueira, managing crowds of 50,000 at peak times in Salvador is peanuts. “We currently have five million to keep an eye on.” That’s the number of passengers who ride the São Paulo metro – every single day! The director of transportation planning has been with the metro for 40 years. He was involved in setting up the local public transport network right from the start. “Back then, they were desperate for engineers to work on the project,” he says, explaining how, as a nuclear physicist, he ended up at the metro. Today he ranks among the most seasoned experts on metro systems, and his expertise is regularly in demand around the world.

The transportation authority in South America’s largest city also employs Bosch technology to keep an eye on things in its 66 stations. The biggest control center on the Rua Vergeiro looks like mission control at a space agency. Over 100 men and women work here, keeping watchful eyes on 125 trains and their passengers. Hundreds of cameras and sensors feed data and images into the control center’s computers, which can then be viewed on a variety of monitors big and small.

São Paulo’s metro is one of the world’s most heavily-trafficked public transportation systems. “The fare is very cheap, so the metro attracts a lot of passengers. That has brought us almost more success than we can cope with,” Junqueira says. Every day, 900,000 people pass through the central hub at Praça da Sé alone, at the heart of the city’s financial district. “We’ve reached our limit. At peak times, 13 passengers are crammed into one square meter. The maximum is supposed to be six,” Laurindo Junqueira says. For that reason, the system is undergoing continuous expansion; transportation experts predict that the megacity of São Paulo will grow from its current population of 20 million to 30 million by 2030.

Dealing with such large numbers of people is a challenge for the security experts. An adjacent room houses even more monitors, with images of platforms, escalators, and entrances. This is the domain of João Cruz, from where he coordinates the activities of over 300 security personnel on the ground. Four colleagues check the images and the messages received from passengers, who text an average of 250 emergencies, technical malfunctions, or other problems every day. “When an emergency call comes in, we can have an officer on the scene within three minutes,” Cruz says. Like Junqueira, he considers the metro one of the safest places in São Paulo’s urban jungle. “We register an average of one serious incident per million passengers. We compared that with the 32 biggest transportation authorities in the world. Thanks to our surveillance system, we came out at the top of the list,” Cruz says proudly.

i

Decades of doing business in Brazil

Bosch has been part of Brazil’s development for many decades now. Carlos Schlosser opened the company’s first office in Rio de Janeiro in 1910. Two years later, the job of marketing Bosch products passed to a newly established company, Borghoff S.A. On November 16, 1954, Robert Bosch do Brasil Indústria e Comércio de Acessórios para Motores e Chassis Ltda. was set up. Two years later, its headquarters was moved to Campinas, following the start of diesel-component production there.

From 1963, Junkers heating appliances were imported from Germany and sold in Brazil. One year later, Rexroth Hidraulica Ltda. was established. Since 1970, Packaging Technology has had a subsidiary in the country, Bosch Máquina de Embalagem Ltda. Five years later, manufacturing of diesel components started in Curitiba. In the same year, Bosch joined PROÁLCOOL, a government project to promote the use of alcohol as a fuel.

In 1988, to coincide with the market launch of LE-Jetronic in the country, the one-thousandth Bosch Car Service in Brazil opened its doors. The year 1994 saw the introduction of flex fuel technology, developed especially for Brazil. And one year after Thermotechnology had set up its own subsidiary in Brazil in 2001, Security Systems followed suit. Today, Bosch employs some 10,000 associates in Brazil, at locations in Campinas, Curitiba, Joinville, Atibaia, Belo Horizonte, Pomerode, and São Paulo.

The company’s interest in Brazil extends far beyond the country’s business significance. Motivated by a long-standing fascination with Brazilian history and culture, in the 1960s Bosch began assembling a specialist collection comprising first editions of important works on many aspects of the country. The collection, which is located at the company’s headquarters, currently numbers some 1,000 titles. It spans the period from the continent’s “discovery” in the 15th century to the establishment of the Republic of Brazil in the late 19th century.

Among the most valuable works are a letter from Columbus written in 1493 in Latin, as well as various rare atlases, including the 1482 Ulm edition of Ptolemy’s Cosmographia, which did not yet include the Americas. The value of the collection lies in the comprehensive picture it offers of Brazil during those centuries and the rarity, origin, and superlative condition of its volumes.

Reducing crime

Another Brazilian who understands what a vital service he provides is Roberto Cruz. He coordinates security for the local authorities in Santos. Located an hour southeast of São Paulo, this port city was the first community in Brazil to use cameras to monitor public spaces. Santos is a popular tourist resort and weekend retreat for *Paulistas*, as the people from São Paulo are known. So it was in the city's interest to make the town as safe and thus as attractive to visitors as possible. They used a Bosch system from the outset, and this has now been in operation since 2007. "Crime in the monitored areas has gone down by 60 percent," says Chief Inspector Fabio Mortari with satisfaction. He recounts the time a pickpocket took a wallet from a Rio de Janeiro tourist on the beach boardwalk. "With the help of video surveillance, we caught the perpetrator and gave the surprised victim his wallet back before he had even noticed it was missing."

Diesel technology keeps supplies on track

The drive between Santos and São Paulo illustrates the vital importance of roads as the chief supply routes in Brazil. Given the rudimentary quality of the railways in this booming nation, trucks and buses are the principal mode of transport. Without Bosch technology, the country would quickly grind to a halt. "About eight out of ten trucks and buses are fitted with our components," says Mário Massagardi, vice president for sales and engineering at Bosch Diesel Systems in Curitiba. Some 2,700 associates here manufacture components such as injection pumps and injectors for use throughout South America. At this southern Brazilian location, Bosch has also developed a special solution for truck engines: DualFuel systems. They enable diesel engines to run when natural gas or ethanol is added. "Gas, in particular, is much cheaper than diesel. With these systems, we can offer additional alternatives for the transportation industry, which has been badly hit by the high fuel prices," Massagardi explains.

"In the years to come, our products are likely to become even more prominent," the diesel expert predicts. A large percentage of the trucks on the roads are past their prime and not able to cope with the Brazilian economy's growing needs. What's more, the PROCONVE 7 standard – which corresponds to Euro 5 – was introduced for trucks in Brazil at the end of 2012, posing yet another technical challenge. Massagardi sees even greater opportunities in another market that has not yet been tapped at all: "Up to this point, the Brazilian government has prohibited diesel engines in passenger cars to discourage fuel imports. But now the country produces enough to keep itself supplied, and we figure that this restriction will be lifted soon."

Instead of diesel, cars in Brazil have so far always run on gasoline or ethanol. Because of that, Bosch developed the flex fuel system especially for Brazil, which allows vehicles to run

i

Flex fuel/DualFuel

The right mixture – Bosch makes it possible

In the 1970s, the high cost of importing fossil fuels prompted the Brazilian government to focus more strongly on ethanol as a substitute for gasoline and diesel. After all, this was a fuel that could be made with locally grown sugar cane. Since then, ethanol production has developed into an important industrial sector. The use of diesel engines in passenger cars is still prohibited. Ethanol poses considerable challenges for systems manufacturers, since the liquid can damage components. For this reason, special alloys, materials, and surface treatments are needed to protect parts such as pumps, rails, injectors, and even spark plugs.

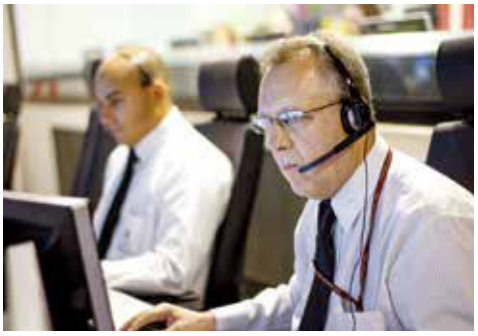
Calibration of the control unit is considerably more complex than with other combustion methods, requiring roughly 50 percent more effort. It has only been possible to combine gasoline and ethanol since Bosch developed flex fuel technology specifically for the Brazilian market. The special thing about this technology is that the ratio of gasoline to ethanol is flexible. Today, roughly 90 percent of all passenger cars on Brazil's roads are equipped with this "flexible fuel" technology. In 2013, the ten-millionth flex fuel vehicle was manufactured in Brazil. Other important markets for flex fuel vehicles are the U.S., Canada, and Mexico.

The Bosch Flexstart system also makes cold starts possible with pure ethanol (E100), even at temperatures below 13 degrees Celsius. Unlike conventional flex fuel systems, the Bosch system does not require any additional gasoline in order to pre-heat the ethanol. This task is assumed by glow plugs integrated in the fuel rail.

Engineers at Bosch Diesel Systems in Curitiba now want to transfer this experience of combining different types of fuel to diesel engines. First prototypes fitted with "DualFuel" technology are already on the roads. Instead of CNG, ethanol can be used to fuel trucks in combination with diesel – in the sugar-cane industry, for example. A second variant which combines diesel and CNG costs up to 40 percent less than pure diesel and promises to find application in more areas. Using DualFuel technology, 70 percent of a vehicle's fuel needs can be covered by CNG instead of diesel.

In Brazil, most goods are transported by road. More than 80 percent of all trucks are equipped with Bosch diesel technology.

Thanks to its near-comprehensive surveillance of the highway, the control center can react quickly when something goes wrong, sending help to the scene within minutes.



on either of these fuels, as well as on any mixture of the two. The main challenge concerns the fuel pump and fuel rails, as ethanol is a highly corrosive substance. But as Gerson Fini, regional president Gasoline Systems in Campinas, says with satisfaction: “We solved the problem.” In short, more than 80 percent of cars that use flex fuel contain Bosch components.

Bosch Security Systems also has a role to play on Brazil's roads. Every day, for example, 900,000 vehicles traverse Bandeirantes and Anhanguera, the two main arteries between the million-strong cities of São Paulo and Campinas. The private operator CCR AutoBAn has been using Bosch video cameras to expand surveillance there since 2000. And it has achieved standards very few routes can match anywhere in the world: “We can now monitor over nine-tenths of our 360 kilometers of highway,” says Neucélia C. Messias, head of the control center in Jundiaí. Camera surveillance will reach 100 percent in 2014. From here, the hand-picked, specially trained staff feed information to the traffic display signs, giving drivers timely warning of any hazards up ahead. If there are accidents, they direct the emergency services. “We have been very satisfied with the Bosch technology over the years, because it allows us to monitor what’s happening on our routes day or night, rain or shine,” the head of the control center says approvingly.

The cameras are also useful for drivers, who can check www.autoban.com.br/ao-vivo to get a picture of the current traffic conditions. “When there are delays, we also indicate alternative routes that aren’t part of our network,” Messias says. The user always takes top priority, even if it means collecting less at the tolls. There is also a police officer stationed at the CCR AutoBAn control center. But all the police are allowed to do is watch: “If they want to make active use of our technology or the resulting images, they need a warrant,” Messias explains. ❮

15:33

Chile, Calama

Official language	Spanish
Capital	Santiago de Chile
Area	755,696 km²
Population	16.6 million

UTC –04:00

02

Copper – crucial for connectivity

End-to-end solutions for mine operators

The world would be a different place without copper. Connectivity depends on it – the metal is literally at the heart of data and electricity networks around the globe. One of the places it is mined is Chuquicamata in Chile, where the copper mine produces up to 530,000 metric tons every year. An operation this big requires appropriately-sized equipment: the list here includes 100 huge dump trucks each weighing in empty at over 200 metric tons, more than 60 excavators with shovels as big as houses, 16 gigantic drilling machines, and kilometers of conveyor belts.

The Bosch Group is valued as a competent supplier providing a number of end-to-end solutions. Bosch Rexroth supplies the hydraulic systems for the heavy plant. The diesel components for the huge machines come from the Bosch facility in Curitiba, Brazil. The hot water for the site's needs is provided with the help of Bosch Thermotechnology, while cameras from the Security Systems division monitor the safety of personnel. ❮

15:13 Every day, thousands of tons of slag are moved using heavy machinery.

03

Living tomorrow's mobility today

Singapore tests out an innovative mobility concept

Is electromobility just a distant dream? Not by a long shot – in fact, its suitability for everyday use is being tested in the metropolis of Singapore right now. Based on Bosch infrastructure that is without equal anywhere in the world, its features include an assistance function that directs drivers to the nearest charge spot.

Curious glances follow the little Smart as its glides almost inaudibly between Singapore's skyscrapers. The tiny car has no trouble keeping pace with the rest of the traffic. Indeed, the Smart emblazoned with the words "electric drive" accelerates surprisingly quickly at traffic lights, catching some drivers of more luxurious models off guard. The electric Smart is always sure to turn heads; after all, electric cars are still a rare sight, even in this southeast Asian financial hub. "It can happen that people want to take my picture with the car," says Samantha Yeh, who drives her company's electric car privately as well.

In Singapore, however, cars like Samantha's won't be a rare sight for much longer, thanks to a groundbreaking government initiative. As early as 2010, this city-state's government voted in favor of developing an infrastructure that would make electric driving, including battery charging, possible anywhere in the city. In addition, feedback is being collected on how well the system functions in practice. Bosch Software Innovations, the Bosch Group's systems and software unit, is in charge of setting up this infrastructure project, which is the only one of its kind in the world.

"We've set up 114 charge spots, which means we now have the entire city of Singapore covered," says Friedemann Bay, head of this Bosch project, as he proudly takes stock of results so far. The charge spots are the only part of the Bosch infrastructure that can actually be seen. At its core is software that can manage huge data streams. In this city of 5.8 million, for example, Bosch has also developed a system in which an app lets drivers reserve a charge spot near their destination. "The app shows you exactly which of the city's charge spots are available or in use," Bay explains.

A variety of charge spots and payment systems are also being tested. Eventually, any number of providers, such as parking lot operators, shopping malls, banks, cinemas, and theaters should be able to use the Bosch platform. With that goal in mind, the software platform is being kept open.

For the mobility of the future, Bosch also develops systems such as electric motors, batteries, and power electronics.

Singapore, Singapore

Official languages	Tamil, Malay, Chinese, and English
Capital	Singapore
Area	712.4 km²
Population	5.3 million

14:41

A modern city with an innovative approach to mobility: in Singapore, electric cars are in daily use.

"The government aims to use this project to gain experience on several fronts," Bay says. What infrastructure and supply grids does such a densely populated area really require for electromobility? How many charge spots do people actually need? What happens if everyone plugs in their electric cars at the same time at the end of the workday? Singapore's government also wants to know the best way for people to get around the city-state in the future. What is the right ratio between public transportation and private cars? Might it be possible to use electric cars in car- or taxi-sharing schemes, for example? "In order to make these political decisions, some of which are quite controversial, the data we gather during daily operation will be crucial. Experts in many countries are keen to find out how we get on," Bay says.

Valuable feedback from real-world use

The pilot project in Singapore currently includes about 100 electric vehicles. They are operated by various authorities of the city-state. And companies such as the software company SAP, which already runs a small e-fleet in Germany, have also joined in with their own vehicles. "We have tailored our existing system to the conditions in Singapore and are now also collecting feedback on the practical experience of using it," says Simon Dale, who is in charge of the project at SAP. Employees such as Samantha Yeh can reserve

16:27_ "If you don't reserve in time, all the e-cars are gone."

Samantha Yeh

i

Electromobility projects

Experience gathered in everyday practice in Singapore is helping to launch and refine other projects around the world. Bosch is involved in more than 15 infrastructure projects for electric vehicles across the globe. One of these is in Milan, in northern Italy (Companies for eMilan). Here, various companies have built a network of charge spots. Indeed, downtown Milan, where private cars are normally banned, has been opened for electric passenger car traffic. In Berlin, Bosch is contributing the software for the Hubject joint venture, which is linking electromobility suppliers, charge-spot operators, utility companies, fleet operators, automakers, and their customers in order to enable comprehensive access to a charging infrastructure.

In 2013, a research project supported by the German Federal Ministry of Economics and Technology called “Get eReady” launched in the greater Stuttgart area. Scheduled to run until December 2015, it’s exploring the potential of electromobility for vehicle fleets of varying sizes and types of use. To this end, at least 750 plug-in hybrid and fully electric vehicles are to be newly registered. This number of vehicles will deliver reliable data on driver profiles, charging requirements, and where charging infrastructure is needed.

13:28 Samantha Yeh is so enthusiastic about her company’s electric car that she uses it privately as well.

a car online for their own use. “There’s a big demand,” Dale says, pleased with the success of his project. “That’s right,” his colleague agrees. “If you don’t log in and reserve in time, all the e-cars are gone.”

“We have found that users only average a little over 60 kilometers a day in the city,” Bay says. Moreover, in Singapore’s tropical climate, a lot of energy is needed to cool the passenger compartment while driving. The capacity of today’s batteries is more than sufficient to meet those needs. Electric vehicles have proved to be a practical and eco-friendly alternative in urban traffic. Practice has also shown that the cars are usually parked close to drivers’ workplaces or homes. “That puts the need for charge spots in the city center into perspective,” Bay says.

Hands-on experience such as this is what helps the electromobility experts. Samantha Yeh, internal IT coordinator at SAP Singapore, uses the electric car more than the average driver, including on weekends. “I still have to plan so I can get to a charge spot in time to recharge the battery. But the Bosch system makes it very easy to find the right spots. It’s really fun to drive these cars.” The IT specialist also has no trouble figuring out the different charging systems available in Singapore. That’s a thumbs-up for her colleague Simon Dale and his efforts: “It’s not a question of if but when electromobility’s day will come.” ‹

04

A guardian angel on board

The fight against organized crime goes high-tech

Goods worth billions of euros are transported by road every day. Criminals know this only too well. They have valuable consignments, especially computers and games consoles, in their sights. Now, invisible guardian angels are taking a growing number of truck drivers and their cargoes under their wings.

Michael Lindner is one of those truckers who are not easily fazed. After all, he's spent a good 30 years crisscrossing Europe's highways. At night, too, he prefers to stay in his rig. "You wouldn't believe the suspicious types slinking around the vehicles," he says, shaking his head. He's well aware that some of those shady characters are eager to get their hands on the merchandise he transports across Europe.

Cigarettes are especially coveted because they're easily resold. "A fully loaded semi carries goods worth between 2.5 and 3 million euros," explains Anja Brettschneider, general manager at Log-In, the forwarding company that Michael Lindner works for. In Germany alone, crime syndicates attempt to steal the freight carried by Log-In trucks on average every two to three months. "So far without success," Brettschneider says with a smile. "But we spend a substantial amount on security," she adds. It comes to several hundred thousand euros each year – and that's just at Log-In.

Combating attacks by criminal gangs is a global problem, and one that relies heavily on sophisticated technology. Many trucks that transport cigarettes, consumer electronics, or computers travel under heightened security and are connected via satellite to a control center. What's more, drivers have to stick to predefined routes. That means the "kings of the road" have to abide by strict rules. "While it does restrict your freedom to choose a route, it's good to know someone is watching your back," Lindner says.

"Hi, this is the control center. Why did you just turn off the route?" Jürgen Morlok is one of the invisible guardian angels who never leave the truckers' side while they're on the road. He checks that drivers closely follow the predefined routes and only stop at agreed-upon points. If they deviate even slightly, an alert instantly appears on his screen. "Traffic has been rerouted, I'll be back on course soon," the driver reassures him from somewhere in Berlin. The two men exchange pleasantries before ending the call. From his position at the Bosch Security Systems control center in Magdeburg, Jürgen Morlok has kept an eye on over half Europe's roads for eight years now. With its eight screens, his workstation is reminiscent of an air traffic controller's. "It takes about two years before a staff member can handle these responsibilities alone," explains Marco Thiel, an expert instructor in the field of mobile security.

Over the course of a shift, Morlok and four of his colleagues monitor the progress of 200 trucks on average. "That's roughly a

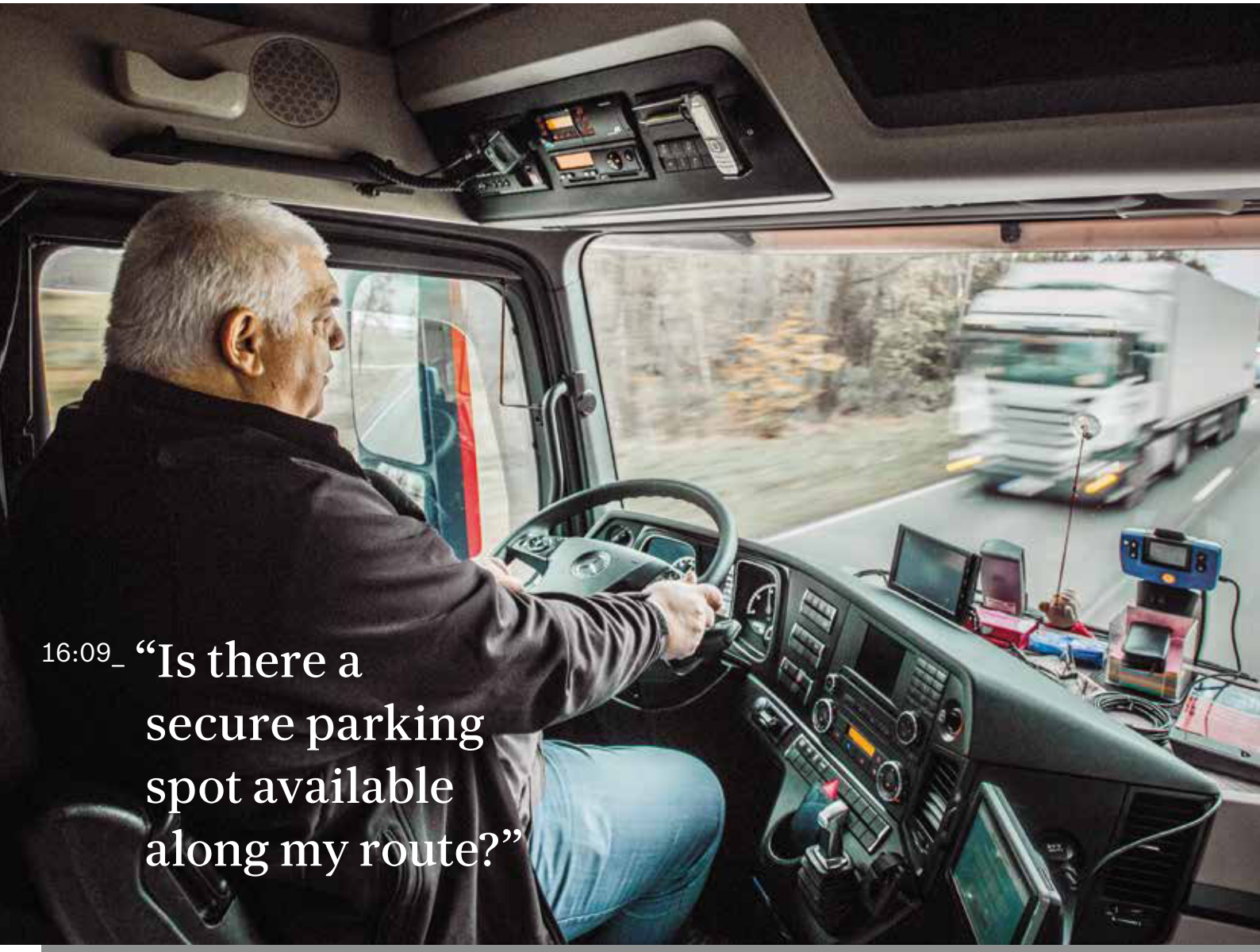
Jürgen Morlok monitors trucks in transit across Europe from the control center in Magdeburg, Germany.

Germany, Berlin

15:44

UTC +01:00

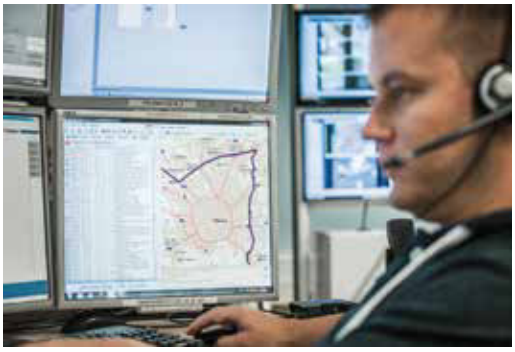
At the end of a long drive, Michael Lindner is relieved when he manages to find secure parking for himself and the valuable cargo in his 40-ton truck.



16:09_ “Is there a secure parking spot available along my route?”

200 trucks
are monitored during each shift in the control center

That corresponds to a merchandise value of
1 billion euros



16:10_ “Yes, there are some available at the Theessen rest stop on the A2 freeway. I’ll reserve a spot for you.”

billion euros in merchandise,” says Thiel, adding, “The businesses that make use of our services certainly aren’t just moving peanuts.” And the criminals know this too. Sometimes they wait for the truck to pull out of a cigarette factory’s gates and then tail it until the time is right to make their move. Despite the millions’ worth of freight, it’s the drivers who are the main concern. “Our focus is on the drivers’ safety and getting them help fast if anything happens,” Thiel says. Anja Brettschneider couldn’t agree more: “The safety of our employees is our number one priority.” This concern for their welfare is repaid by the truckers in the form of fierce loyalty.

Increasingly brazen criminals

Attempts to get at the goods despite the tight security are becoming increasingly brazen – with some criminals even going as far as to attack moving vehicles. “A gang once tried to cut holes in a trailer from a specially rigged van,” recalls Marco Thiel. The trailer was electronically secured, so the control center instantly picked up on the activity. They notified the police, who apprehended the van at the next highway exit. Since highly organized syndicates also try to jam the signal between the truck and control center, the technology has to constantly be one step ahead in order to fend off this high-tech interference.

Drivers and their cargo are especially at risk at truck stops and rest areas. It is here that two out of three heists occur, above all at night. The Transported Asset Protection Association (TAPA) estimates that goods worth more than eight billion euros are stolen by crime syndicates every year. “There’s a huge need for well secured parking,” says Anja Brettschneider, underscoring the problem. The EU Commission in Brussels is even considering making it a requirement for all EU member countries to provide secure parking for truckers. The first steps in this direction have already been taken. “Secure Truck Parking” is the solution provided by Bosch. At present, there are about 100 secure parking spots spread across 13 truck stops in Germany. “Customers can reserve a space in advance using an online booking platform,” explains Thomas Rollin, project director for Bosch Secure Truck Parking.

What’s more, from mid-2014, spaces monitored by camera will be available at two truck stops. “Video surveillance automatically captures any suspicious activity around the trucks,” explains the Bosch expert Manuel Gross, who is working hand in glove with the EU Commission on this issue. The result is that truckers like Michael Lindner don’t have to put themselves in danger by leaving the driver’s cab to check on the cargo. And that’s not all. Reserved parking means that rest breaks can be precisely scheduled, allowing dispatch managers to streamline truckers’ time behind the wheel. “In a second phase, we aim to expand the booking system for standard and premium parking spaces throughout Germany and beyond its borders to provide secure stops along all the major European traffic arteries,” Gross adds. The reality is that there’s growing demand around the world for ways to protect valuable merchandise and truckers from the clutches of crime syndicates.

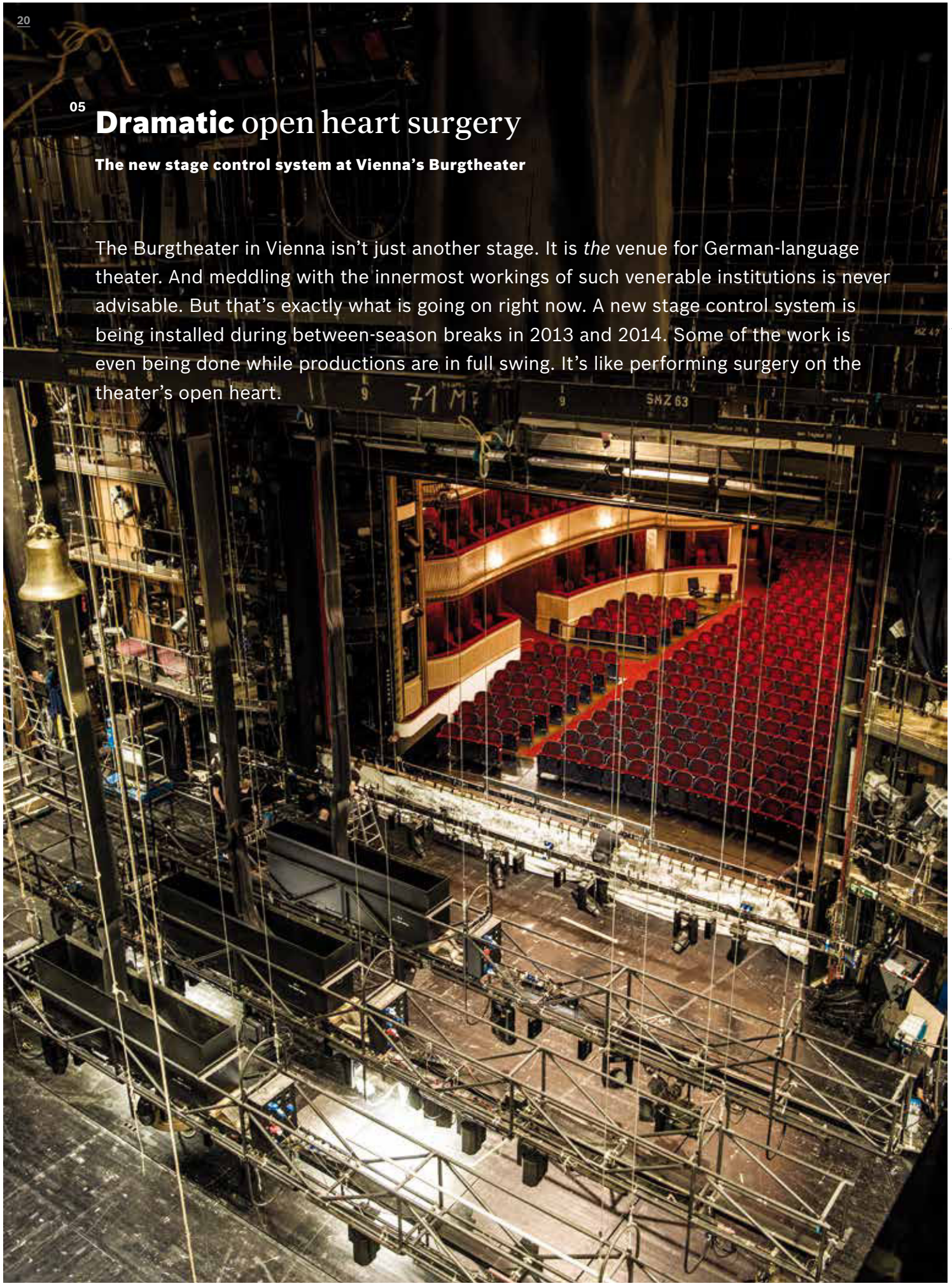
The rigs equipped with GPS tracking devices also deliver a stream of data – such as where there is the least likelihood of a bottleneck, where the incline is less steep, and where a constant speed can best be maintained – that can be used to optimize routes and trip times. All this information is analyzed by trucking companies like Log-In with a view to improving vehicle routing. “Thanks to this telemetry, we’ve been able to reduce our fleet’s diesel consumption by around 10 percent,” Anja Brettschneider says. ❮

05

Dramatic open heart surgery

The new stage control system at Vienna's Burgtheater

The Burgtheater in Vienna isn't just another stage. It is *the* venue for German-language theater. And meddling with the innermost workings of such venerable institutions is never advisable. But that's exactly what is going on right now. A new stage control system is being installed during between-season breaks in 2013 and 2014. Some of the work is even being done while productions are in full swing. It's like performing surgery on the theater's open heart.

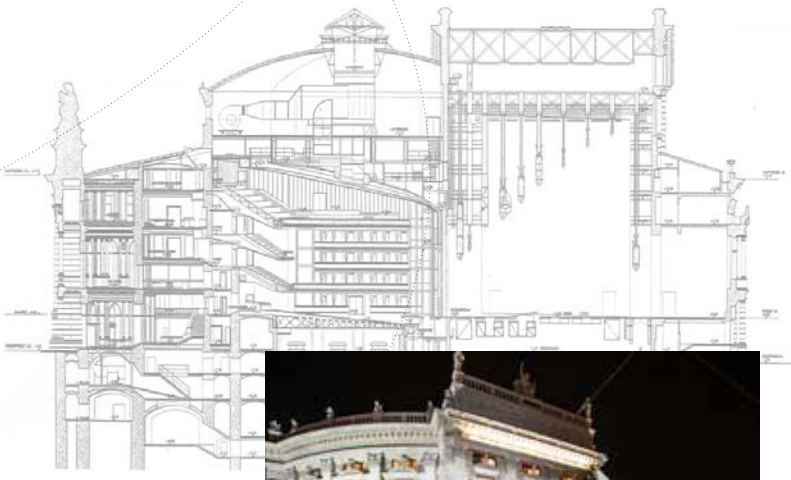


Austria, Vienna

Official language	German
Capital	Vienna
Area	83,879 km²
Population	8.5 million

UTC +01:00

11:07



Vienna's Burgtheater

Facts

Built	1888
Maximum capacity	1,340
Seats	1,175
Stage area	780 m²
Height	8.8 meters or 5 stories
Premieres	9 (2013 – 2014 season)
Diameter of revolving stage	20.8 meters
Height of flies	28 meters
Address	Universitätsring 2, 1010 Vienna www.burgtheater.at

Audiences at Vienna's Burgtheater expect to see world-class performances. Nothing is done in half measures here: "Our patrons are very special," Regina Fritsch says, casting her gaze across the rows of seats that are still empty at this early hour. She adds, "Even after 27 years, I still get nervous at every premiere." Praise is usually doled out sparingly. *Mother Courage and Her Children*, with Regina Fritsch as Yvette Pottier, has just been through its baptism of fire. "Mixed" is how she describes the reviews after the premiere, yet she's pleased nonetheless. "That's the way it is here. The performance is always compared with previous productions. They say, 'Pretty good. But not a patch on what it was like ten years ago.'" Ten years from now, chances are people will be saying, "Fritsch as Yvette, now *that* was something." People expect nothing but the best at "the Burg."

Audiences' high expectations mean a great deal of pressure – and not just for the actors onstage. Behind the scenes as well, everyone is passionately devoted to making "their Burg" a success. "There's nothing like our solidarity anywhere else," Regina Fritsch says. The support of the crew is tangible. "We try to make the impossible happen," says Ernst Meissl, the Burgtheater's technical director, with a grin. Actors, set builders, technicians, carpenters, wardrobe people – they're all one big family who are there for each other. No one here ever looks for a new job. "Once Burgtheater, always Burgtheater," as Meissl succinctly puts it.

The technical director is himself a living institution, having been connected with the theater "forever, really." As a boy, he confidently told his parents, who were in theater themselves, "I want to work here one day." Meissl has now been here for 36 years and has experienced quite a lot during his tenure. Listening to him, it becomes clear that the real excitement happens behind the scenes, not in front of them. But thanks to the Burgtheater family, the excitement never becomes too much to bear.

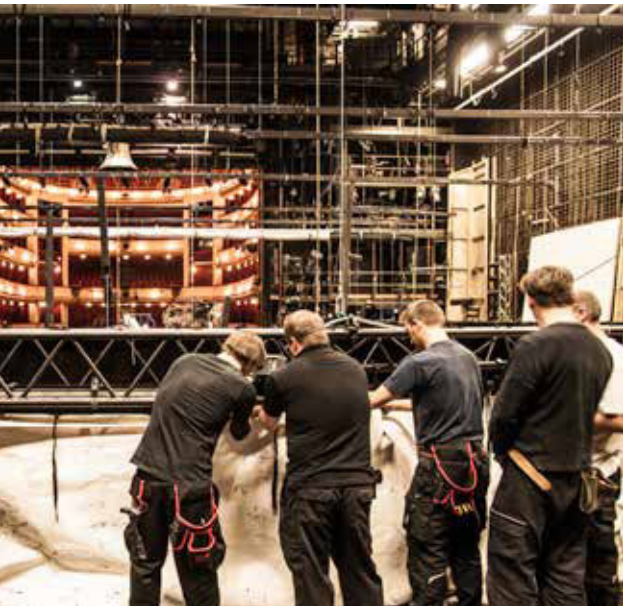
Nothing could throw an old pro like Meissl – or could it? The action going on behind the scenes right now is anything but routine, even for him. And it's very delicate. The Burgtheater needs a new stage control system. That means entering forbidden territory – performing open surgery on the theater's heart, so to speak. It all has to go without a hitch; the alternative is unthinkable. Performances, which only take a break for Good Friday, Christmas Eve, and a very few weeks in the summer, would otherwise grind to a halt.

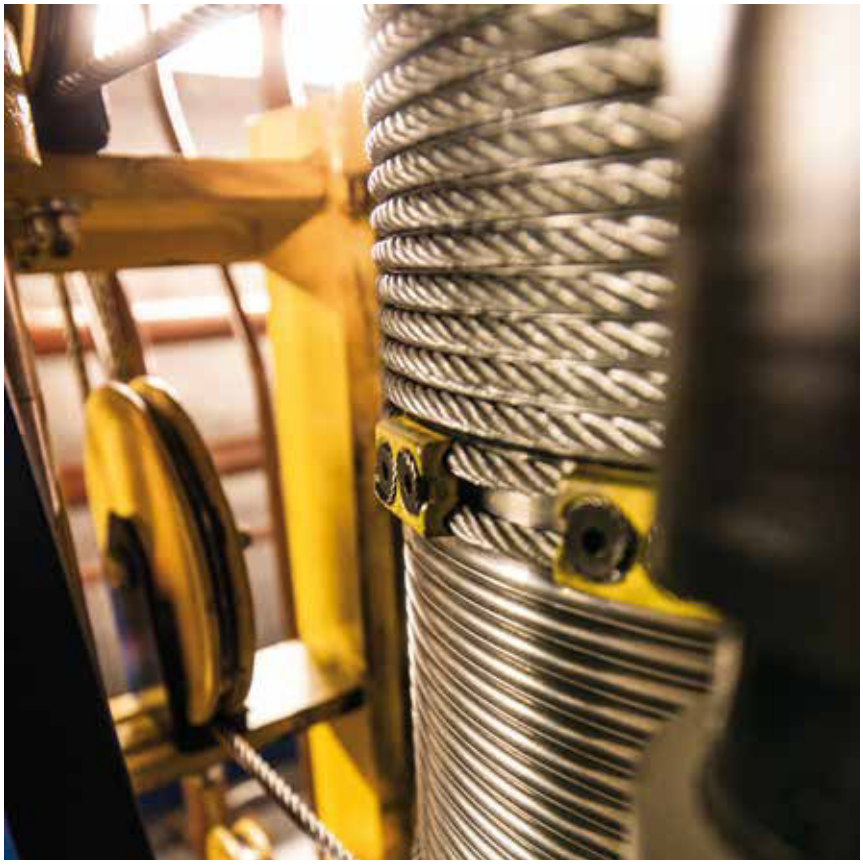
Following a whole year of planning and preparation, this complex operation is already under way. It is inconspicuous, quiet, focused, and highly professional. Any “outsider” granted access to the most sacred inner workings has to be someone the Burgtheater family implicitly trusts. Ideally, such a person should be just as deeply immersed in theater as they are. Leopold Denk fits the bill perfectly. A knowledgeable theatergoer, he is a regular at the Burg. And as an expert at Bosch Rexroth, he is also well versed in stage technology. In fact, he has been eyeing the job of upgrading the Burgtheater for ten years. Now he has his chance. “We’re installing a control system that has no equal in any other theater,” he says with visible pride. Clearly, he is looking forward to seeing it in action at the Burg.

Bosch Rexroth has a wealth of experience in equipping the world’s stages. Moscow’s fabled Bolshoi Theater also boasts technology made by the Bosch subsidiary. “But unlike the Bolshoi, here in Vienna everything has to be adapted to the existing systems,” Denk says. Bosch Rexroth hydraulics have been moving all the Burgtheater’s flies for decades. So the stage is familiar. Denk had already retrofitted the orchestra elevators at the neighboring Akademietheater. What’s more, the Bosch subsidiary Bauer Optimierungstechnik recently upgraded the ventilation for one of the world’s most famous concert halls, the spectacular Goldener Saal (Golden Hall) at Vienna’s Musikverein. This is where the Vienna Philharmonic’s famous New Year’s Concert, broadcast all over the world, is held each year on January 1.

The work carried out so successfully at these tradition-steeped venues was enough to earn the trust of “the Burg.” High above the stage, on the rigging grid, Denk and the Burgtheater’s Andreas Dendl orchestrate the next steps. The preparations for all the wiring, switchboards, and sockets as well as the sophisticated hydraulics are being made during the regular season. At the same time, the stage manager and head technicians shuttle back and forth to the Bosch Rexroth headquarters in Lohr, Germany, for training. “These people are virtuosos in their field. They want to fully master the technology from the word go,” says the technical director Meissl in praise of his colleagues. The transition will be completed during the 2014 summer break. Burgtheater and Bosch Rexroth experts will have just under six weeks to hook up all the wiring and control units. “That’s a tight schedule,” Meissl says reflectively. But then he flashes a confident smile: “We’ll get that done, too, though. After all, we’re the Burg!”

14:08 Open-heart surgery: renovation work on the stage means performing a complex operation on the theater’s most sensitive part.





13:17 Pulling together: changing the scenery requires concentrated teamwork. Using powerful cables, new sets can be lifted quickly into place.

12:54_ “My wife and I are regulars at the Burgtheater, so it gives me great pleasure to be able to install its new stage technology.”

Leopold Denk

When the work is finished, it will even be possible to operate the complex machinery for the stage and scenery from a remote control console in the auditorium. This will give the director a full overview of the set changes from the audience’s perspective, so if he needs to make minor adjustments, it will all be there at his fingertips. Sensors also measure the precise load on the girders from which the flats are hung. That lets even complex, multi-part scenery be flown in and out in sync and with absolute precision. “The chief improvement for us is safety,” Meissl says, as the heavy bells for the Mother Courage set are hung four stories below him.

This unique new stage technology is right in line with the Burgtheater philosophy. “It’s a philosophy of excellence and a pioneering spirit. That’s why, when the theater was built in 1888, it was the first to install electric lighting,” Karl Heindl says. His official title is safety officer, but he is in fact the Burg’s walking encyclopedia. “Brand new effects often debut on our stage. That’s part of our innovative spirit,” Heindl says, to which his technical director adds, “We expect the new technology to unlock a lot of new possibilities.”

The thrill of anticipation among the experts behind the scenes is palpable. More technology means more opportunities to bring to the stage all the ideas the artistic designers come up with. No matter how bizarre, Meissl, Heindl, and the crew make it happen. “For a young actress’s dramatic ‘suicide,’ we got an inflatable cushion like firefighters use,” the two men recall, grinning. “With that, she ‘died a safe death’ from six meters up.” The first rehearsal at the fire department, however, caused quite a stir, as Meissl recalls: “People thought this pretty young girl really wanted to do herself in.”

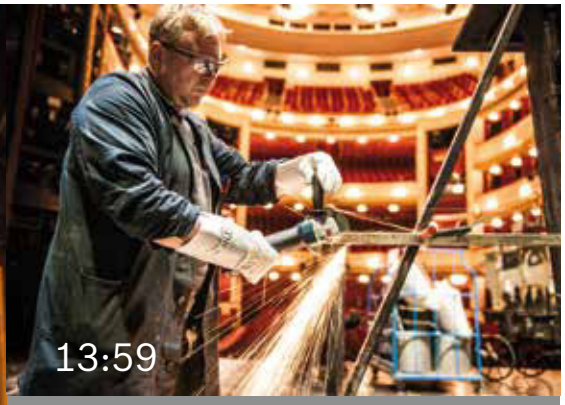
Praise for the audience

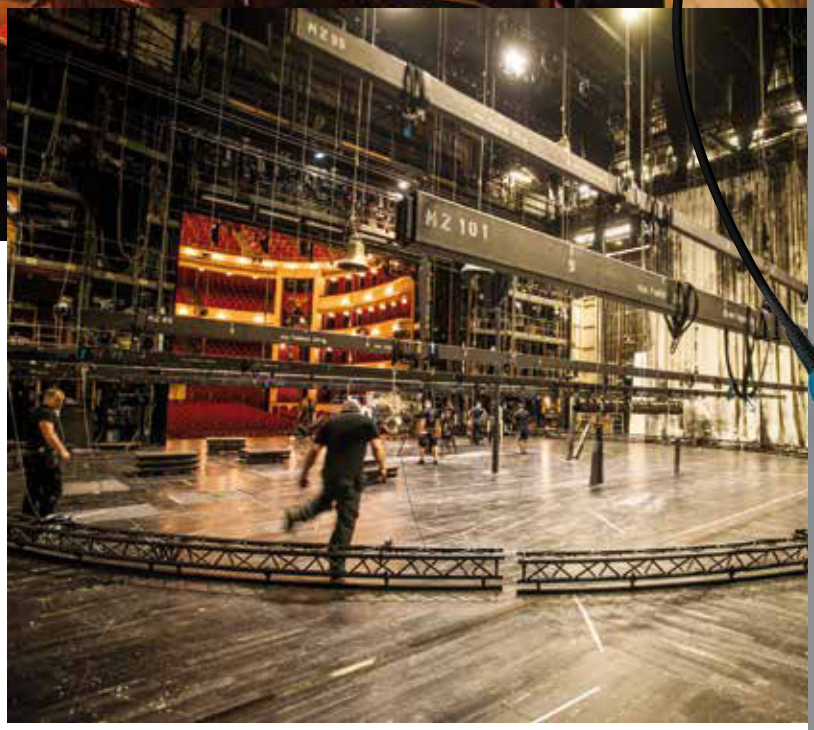
Meissl and Heindl are an inexhaustible source of such tales, which the audience never hears. All theatergoers get to see is the scripted drama on the stage. Here, Regina Fritsch will play the unhappy Yvette Pottier again this evening – with all her misfortunes, conflict, and contradictions in the dismal era of the Thirty Years’ War. The Brecht play demands a lot of its audience, the actress admits. “But people expect that here, and they come to be challenged, even provoked,” she says approvingly of “her” Viennese audience. And when not a sound, not even a cough can be heard in the house, she knows the actors have cast their spell. “That’s what you become an actor for,” Regina Fritsch says, her eyes sparkling. And that’s something the Viennese can certainly appreciate. The productions and acting skill at the Burg have long been the talk of the town. They are a must-see. That’s why there is a performance nearly every day. Despite its opulent architecture, the Burgtheater is still a theater for the people, with affordable ticket prices and even a standing area.

The most popular and celebrated actors and directors are assured of their fans’ loyalty even after death. “That’s one of the special things about the Burg,” Karl Heindl says. Their bodies are laid out on the right-hand stairway known as the “Feststiege,” the Festival Staircase. “The usual red carpet is replaced by a black one, the walls and golden candelabra are swathed in black cloth, and solemn music plays in the background. That gives audiences an opportunity to pay their last respects and say goodbye,” Heindl says, describing a procedure that could only happen in Vienna. Here, where sophistication and supreme performance are so passionately lived and loved, even a sad occasion should be carried off in grand style. Otherwise it wouldn’t be the Burgtheater. ‹

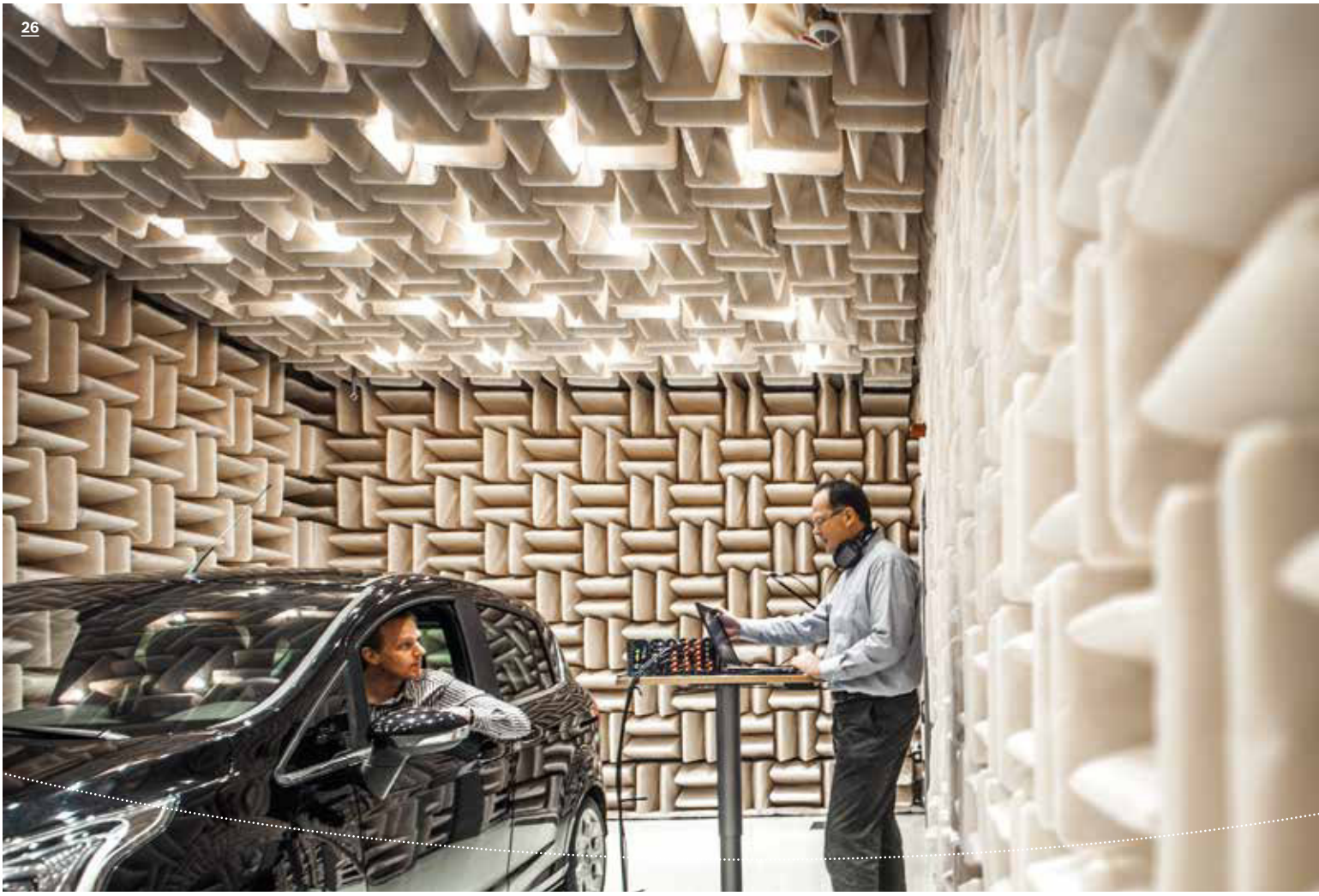
13:02 It plays a starring role in the dreams of many playwrights, directors, and actors: Vienna’s Burgtheater has long been the most important venue for German-language theater.

11:56 Regina Fritsch takes a break from rehearsing to see things from the audience’s perspective. The actress has been one of the Burgtheater’s iconic figures for many years.





Working safely: the Bosch power tools being used for renovation work in the theater shut off automatically when dropped.



06

Undercover operation hits the right note

Bosch sound design in Schwieberdingen

Automotive equipment has to work smoothly, but the right sound is just as important. A quality product must not produce unwanted noise. Getting the sound right isn't a matter of chance, it's the job of experts trained to listen very carefully.

12:43 Technology with perfect pitch: trying to achieve the perfect "soundscape" inside the car.

12:21 Volker Scheef (left) und Michael Fischer listen intently to a car. By eliminating noises that might disturb drivers, the Schwieberdingen sound artists fuse technology and sound into a harmonious whole.

Julia starts her sports car and sets off to work. The engine purrs reassuringly. The traffic is congested, as almost every morning. But Julia is relaxed, the pleasant sound of the engine now blanketed by the tunes coming from the radio. What she doesn't know is that the pleasant sound of her vehicle is the result of precision planning and measurement by experts. Their job is to meld every whine, click, tap, and hum produced by a car's individual components into a harmonious whole. So the music from Julia's radio remains free of even the slightest ripple of disturbance.

The sound studio these specialists use is the acoustic test chamber at Bosch's center of competence for noise and vibration in Schwieberdingen near Stuttgart. Behind a heavy, meter-thick steel door lies a sound-absorbing room, large enough to accommodate a car. The walls and ceiling are lined with fiberglass wedges in a bright, warm winter white, creating an almost cozy atmosphere. The special structure of the wedges absorbs sound rather than reflecting it, with the size of the individual wedges determining the frequency. When the door closes, the room falls eerily silent. The world outside with its myriad sounds is locked out, literally. All you can hear is your own breathing. For many people, the complete lack of ambient noise soon becomes hard to bear.

But for noise experts like Michael Fischer and his team, total silence is the perfect working environment. Today they are subjecting a new injection valve to what is known as a sound cleaning process. "We measure the operating noises of our parts. They may not be very loud but the sensitive human ear may perceive them as unpleasant and even annoying," Fischer explains. The right sound is very important these days, he says, because it underlines the status of a vehicle. The more expensive the product, the less customers are willing to accept an unwanted or even unpleasant "soundscape."

Fischer and his team have to neutralize the noises produced by the individual parts, so that the special sound designs automakers create for their engines can achieve their full impact. "It's a question of subtle details, including the things you don't hear once we've finished our work. We're involved in a kind of undercover operation," he explains. Fischer works closely with Bosch colleagues in research and development. When a new product is being created, he and his team are usually involved from the outset. "We can give the engineers timely tips on how to hit the right note with a new part," says Fischer. Close cooperation with colleagues from various specialist departments is key to success.

The sound of an injection valve is measured by tiny microphones arranged radially around it. An electronic system controls the fuel supply and the operation of the test piece, just as it will later in the actual engine. Testing begins, and the valve ticks gently as it opens and closes. The microphones pick up the noise as they rotate around the test setup. Via a tangle of cables, the data collected is transferred to a computer. The whole operation takes just ten seconds.

But now the real work begins. The experts analyze the data and compare it with other measurements. "Often we listen to the recordings again ourselves if the numbers produced by the computer don't seem to add up," Fischer says. So is he, like Julia and millions of other drivers, able to relax in a car without listening out for unwanted noises? Fischer laughs: "Sadly no. I've caught the noise bug. It's an occupational hazard, but it's still fascinating." ‹


15:13
UTC 00:00
Ghana, Accra
Official language English
Capital Accra
Area 238 ,537 km²
Population 25.2 million
MONROE

07

Training for life

Power tools experts share their knowledge – and learn a lot in the process

For Westerners, the market in Accra, Ghana, is an overwhelming experience: brightly-colored fabrics, an abundance of aromatic fruit, hustle and bustle everywhere. There's practically nothing that can't be found here. Some stalls peddle voodoo dolls and all kinds of desiccated animal parts, with enough options to keep even sorcerers and necromancers satisfied. A couple of kilometers down the road, Princess Viakos's shop holds the next surprise. Hammer drills, cutting discs, and angle grinders are among the items for sale here. This slightly lopsided building isn't peddling supernatural paraphernalia but high-tech equipment for tradespeople. With a smile, the resolute owner of this Ghana-style DIY store points to the packages with the five red letters: "Bosch is especially popular here," she says.

Drills, screws, and hooks, as well as tools of all kinds, are stacked up to the corrugated iron ceiling. Demand is high – after all, Ghana is among the countries that are developing by leaps and bounds. Its gross national product is recording double-digit growth annually. The main drivers of this growth are the oil reserves that have been tapped in recent years. And an increasing number of new buildings in the capital, Accra, bear witness to the nation's upward trend.

“There’s growth everywhere, even given that the starting point was quite low,” says Harald Streitberg. He keeps track of the emergence of many western African countries from his base in Casablanca, Morocco. With the experience he has gained in nearly four decades at Bosch – including stints in Chile, Mexico, and Australia – Streitberg knows good market development when he sees it. And once he sees it, he makes sure he’s among the first on the scene.

Harald Streitberg approaches his work with a healthy dose of patience; he knows how long it can take until everyone has reached a modest level of prosperity. So he doesn’t let Accra’s facades fool him. The majority of Ghana’s 24 million inhabitants still live in humble conditions. That is also evident in Princess Viakos’s DIY shop. “I keep talking until the customer buys,” the busy shop owner chuckles. But, as she is very well aware, many people would jump at the chance to buy her wares, if only they could. Bosch power tools are highly sought after, but for most customers a purchase like this is a major investment. “So it’s all the more important that the tools are used properly,” says Jürgen Mamber, who organizes training for salespeople and their customers at Bosch Power Tools headquarters in Leinfelden, near Stuttgart, Germany.

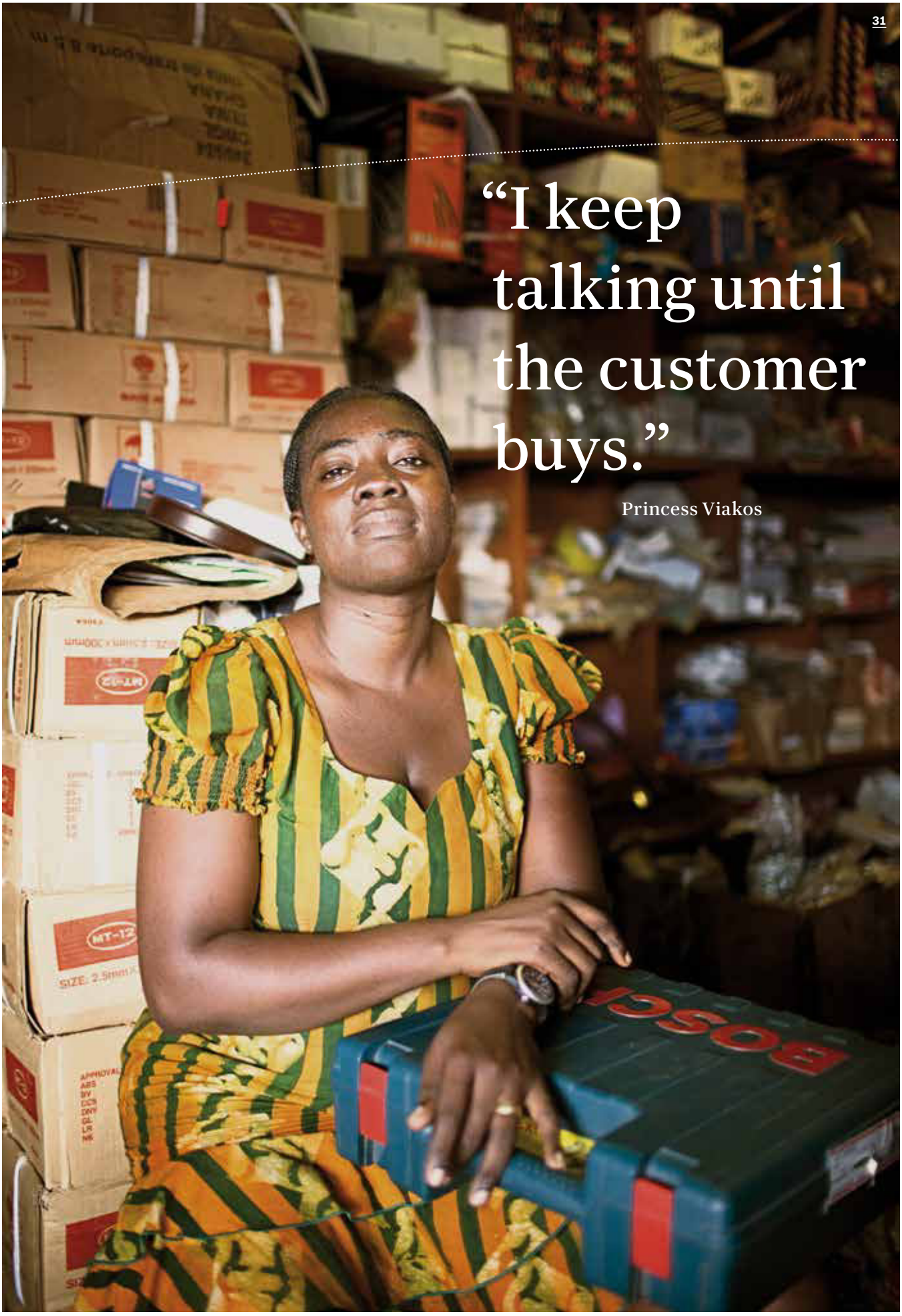
The training Mamber and his colleagues offer around the world teaches technical theory and practical tips on using the tools properly. “The equipment often overloads because people don’t know any better,” Mamber says. Bosch Power Tools works with 98 trainers the world over. Some of them give courses at Bosch training centers such as the one Peter Du Bruyn runs in Midrand, South Africa, midway between Johannesburg and Pretoria: “We train around 900 retailers and customers every year.”

Common issues include unprofessional repairs or tools being put to uses for which they were never intended. “The conditions in Africa force you to improvise,” Mamber says. It’s not unknown to find a circular saw blade mounted on an angle grinder, for example, without a thought given to the risk this poses. “We teach people which tools to use for which jobs. That protects people as well as machinery,” Du Bruyn explains. “So in a way, we also provide training for life,” Mamber says. And it is clearly paying off: “The training we conducted at a construction company in India quickly and dramatically reduced the rate of on-the-job accidents,” he recalls. That greatly impressed the company’s management. “Since then, the company’s construction sites have used nothing but Bosch tools.” The head trainer is pleased that his training courses have had such a successful promotional effect.

But this is not the only positive effect. The experience the trainers gain around the world is channeled back into new product development. One result is the increasing availability in Africa of tools and accessories that are simple, as well as sturdy and versatile. For example, few people can afford to own many different cutting discs. “So now we offer one that can do it all. It’s a little more expensive, but if the customer needs to cut through a steel pipe, it gets the job done,” Mamber says.

New markets like those Harald Streitberg explores, and new applications like those the trainers discover, provide the developers at Leinfelden HQ with completely new insights. A case in point involves the Bosch hammers now being used in mines in the Bolivian Andes. These locations are so remote that they are only accessible on foot or by mule. That means tools must be reliable and durable, because replacements are not readily available. In the mountains, the Bosch trainers realized that the thin air at altitudes above 3,000 meters affects the percussion drills’ compression, causing it to drop so far that the tools no longer work properly. “Nobody had considered that effect before,” Mamber admits. Now the developers have found a solution – and Bosch percussion drills a new field of application. ‹

For Westerners, the market in Accra is an overwhelming experience.



“I keep talking until the customer buys.”

Princess Viakos

46-year-old **Fevzi Yildirim** was born in Hadim, Turkey. At the age of 14, he and his parents moved to Cologne, Germany. He considers himself fortunate to have grown up in two cultures because “you see things in different ways.” He studied aerospace engineering in Stuttgart. “That taught me to challenge things in order to better understand them,” he recalls. In 1998, after completing his PhD at the German Aerospace Center’s Institute of Technical Thermodynamics, he began his career at Bosch in research and advance engineering, where he initially worked on fuel systems. He was made head of a project for fuel pumps in the Gasoline Systems division in 2001. Five years later, he moved to Chassis Systems Control as head of product management and, for the last three years, he has been in charge of the “Motorcycle Safety” product group in Japan, focusing on developing new safety and assistance systems for motorcycles.

08

We want to save thousands of lives

Motorcycle stability control defuses critical situations

Even for seasoned motorcyclists, encountering a sudden obstacle while cornering presents a serious hazard. To help them through such critical situations unscathed, Fevzi Yildirim and his team in Yokohama have developed MSC motorcycle stability control.

Fevzi, you and your team have developed a system that can help motorbike riders enormously when cornering. How did you arrive at this solution?
One in four motorcycle accidents happen in bends. So we said to ourselves: we want motorbikes to remain controllable even when leaning into a bend. Getting there wasn't so easy, however. You have to analyze precisely how bikes react in such situations, what physical forces are at work, and which laws of physics cannot be broken. And then it's a question of taking the rider safely to the limits of those laws – but no further.

Were you always confident that a system like this was feasible?
(Laughs) When you venture into new territory, you never know where the journey will take you. That's what's fascinating about it. After a certain time, it was clear in theory which conditions had to be met. Simulations showed us that our idea could work. But then the idea has to be transferred to the bike. Fortunately, the initial results here were also encouraging.

What does your system do exactly?
When riding along a straight stretch, the wheel will tend to lock up if the brakes are applied heavily. Like in a car, an ABS can get around this problem. But conditions are different in bends. A locked-up wheel has to be avoided there at all costs. That's why we had to draw up a completely new computational basis for our system, which is not comparable with a conventional ABS.

Doesn't it mean that riders will then take more risks and try to push their bikes to the physical limit?
Our system can prevent that. It intervenes before they reach that limit.

What drives you to develop systems like these?
When I was 16, a school friend died in a moped accident. It still affects me today. Young, inexperienced riders in particular need assistance systems like these, but they're not the only ones. MSC has the potential to exert a positive influence on two-thirds of all motorcycle accidents in bends in which the rider is at fault.

But don't these systems spoil the fun?
I've been a keen motorcyclist for decades, and I can tell you there's no loss of enjoyment. For the majority of riders, it's not just about fun anyway. Just think of the millions of riders on the road every day all over the world. For most of them, it's simply a means of transportation they use, often in hazardous road conditions. In India alone, 40,000 people die in motorbike accidents every year. With our system, we can save thousands of lives a year. That fits in with our values at Bosch, and represents an additional incentive for me personally.

You develop these systems in Japan. Why there?
In Yokohama, we have gained a lot of experience through working with the world's biggest names in motorcycle manufacturing. Add to that an exciting mix of German strength in project planning and Japanese attention to detail.

13:19

Japan, Yokohama

Official language	Japanese
Capital	Tokyo
Area	377,835 km²
Population	126.7 million

"When I was 16, a school friend died in a moped accident. It still affects me today. Young, inexperienced riders in particular need assistance systems like these, but they're not the only ones. MSC has the potential to exert a positive influence on two-thirds of all motorcycle accidents in bends in which the rider is at fault."

How do you cope with the different culture?
There are many things in Yokohama that remind me of my Turkish roots. That surprised me a lot. In many respects, we think in similar ways. The family structures are comparable. Even the languages have certain things in common in terms of grammar and sentence structure, though not the words or writing system, of course. All that has helped me understand the Japanese mentality better. I really enjoy living there.

What's next?
So far, we've focused mainly on reactive functions that intervene in critical situations. The next logical step will be to improve the connections between the various functions and their control units on the bike and so further optimize the existing functions. Then we'll turn our attention to predictive functions that can detect critical situations in advance and alert the rider, or even initiate early reactions from the bike – light braking, for example.

What do you mean by a predictive function?
Communication between cars and motorcycles is one example. When there's a risk car drivers might not see motorcyclists, such communication would make it possible to alert them. ❮

MSC

Improved safety – especially in bends

MSC motorcycle stability control is a braking control system for motorcycles that was conceived and developed by Bosch researchers, who also made a first application available. Engineers in Bosch's Chassis Systems Control division have now made this safety feature ready for series production. MSC helps provide the best possible stability in every situation. The system supports the rider when braking and accelerating, particularly in bends. Since nearly half of all fatal motorcycle accidents occur in bends, MSC can help to improve motorcycle safety significantly. And it works without affecting the motorcycle's handling – which means all the pleasure of riding remains intact.

MSC registers the bike's motion using an array of sensors. These include wheel sensors, which measure the rotational speed of the front and rear wheels, and a lean-angle sensor, which computes lean and pitch angles more than 100 times per second. On the basis of these data, as well as other motorcycle-specific parameters such as tire size, tire shape, and geometric position of the sensor, MSC computes how much braking force is possible for any given lean angle.

If the MSC recognizes that braking force is greater than the laws of physics will allow, the ABS control unit activates the pressure modulator in the front or real wheel's hydraulic brake circuit. By lowering the braking pressure and building it up again within a fraction of a second, it ensures that the amount of pressure applied to each wheel during braking interventions is as high as possible without causing the wheel to lock up.

For motorcyclists, the Bosch MSC can be a lifesaver. However, just like ABS, it cannot suspend the laws of physics. Nonetheless, the system supports bikers in borderline situations, helping them get more out of their motorcycles, while keeping them much safer at the same time.

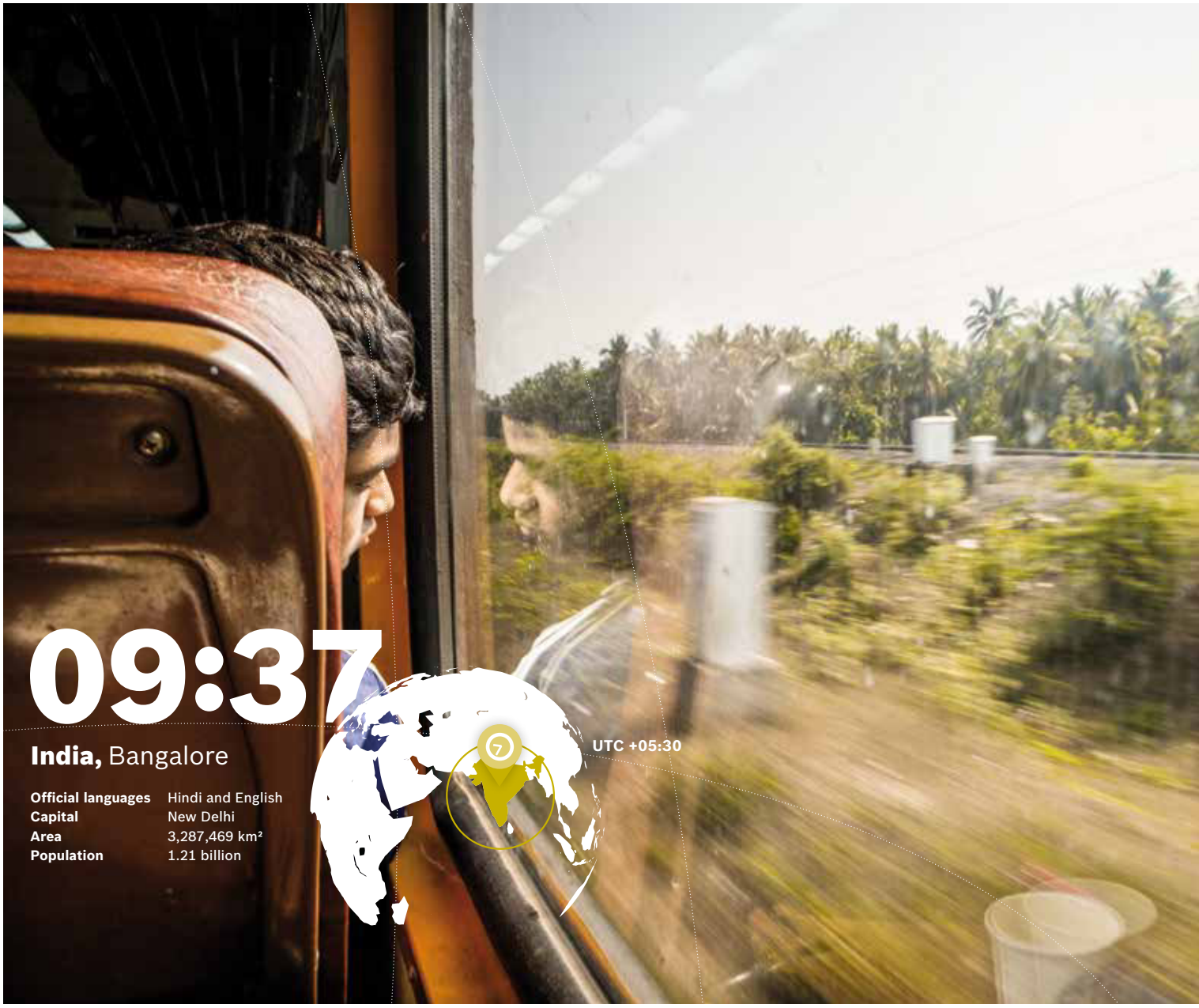
12:39 In Japan, many tests and development stages were needed before the innovation was ready for series production.

09

Keeping millions on track

Bosch diesel technology in Indian locomotives moves millions of people every day

The railway is India's main mode of transportation. Train trips often take days, passing through widely different regions and climate zones. That poses a technological challenge for the engines, whose job it is to reliably get millions of people to their destinations every day.



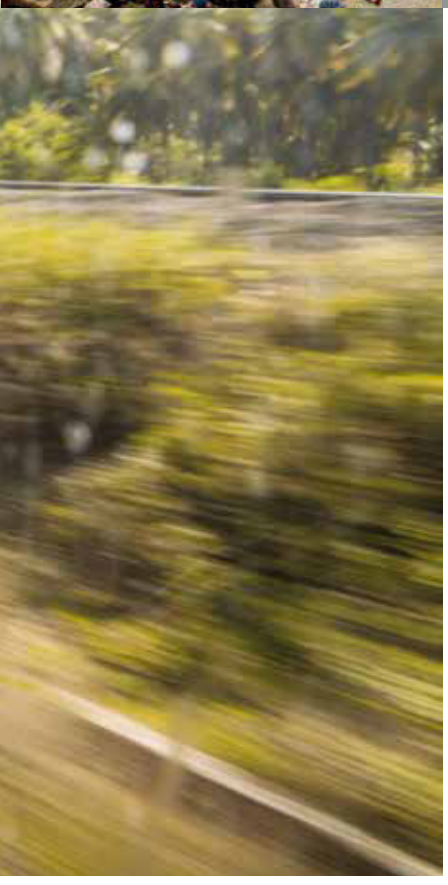
16:59 For millions of Indians, the railroad is the only affordable way of traveling long distances.

In the early hours of the morning, Bangalore station is already bustling with activity. Orange diesel locomotives pull a long train of blue and white railroad cars into the station. Hundreds of passengers wait impatiently on the platform. The train has barely finished grinding to a halt before they push hurriedly into the cars, trying to get themselves settled for the long journey ahead. Most of them will be spending the best part of the day on board.

Often, the exact duration of each trip is anyone's guess. "The long-distance trains leave on schedule, but they often don't arrive on time," Prabhu Shankar says with a telling smile. The

More than 8 billion passengers

use the 65,000-kilometer Indian railway network each year. Its almost 9,000 locomotives also move more than one billion metric tons of freight.



sales manager at Bosch India handles business with Indian Railways and knows what is expected of the trains day in, day out. Some stop at more than 40 different stations, and connect with many different routes. And again and again, the weather plays havoc with the timetable: in the rainy season, heavy monsoons cause delays, and heavy fog in the winter means that speed has to be reduced drastically.

One thing Indian Railways can rely on, however, is the technology of their diesel engines. That's because the beating heart of practically every

New injection technology will boost the efficiency of Indian locomotives.

train in the fleet has been supplied by Bosch since 1968. Plants in Bangalore and Nasik manufacture fuel injection pumps and injectors for the large, 16-cylinder engines. "On long-haul trips, the trains often travel over 2,000 kilometers. We can't have the engine give up on us," Prabhu Shankar says. "The reliability of our components is very important to Indian Railways." Ramamurthy Madhusudhana agrees. The senior engineer carries out maintenance work on Indian Railways' diesel locomotives: "The fact that we have been working with Bosch for more than 40 years is mainly due to the quality and reliability of the technology."

The Indian Railways network spans the entire subcontinent. And India's vast diversity is visible not only outside the train's windows, but also in the constantly-changing clothing and languages of its passengers as the train travels from region to region. Even the menu in the dining car changes: while fiery coconut-based curries are on offer in the south, further to the north the fare shifts to creamy lentil *dal*. Working together with Bosch, Indian Railways is currently improving the efficiency of its older diesel engines. Cutting-edge components will boost the output of the most common engine model from 2,600 to 3,300 horsepower, and electronic injection pumps will reduce fuel consumption by 2 percent. With the 2.2 billion euros Indian Railways spends on diesel every year, that means savings running into millions. ❮


JEFRI YEHUB YANAN
PT Eastern Pearl Flour Mills
Kompas

17:15

Indonesia, Makassar

Official language	Indonesian
Capital	Jakarta
Area	1,904,569 km²
Population	237.6 million

10

Sealed and delivered – all the way to the remotest island

How one-kilo bags of flour can be a game-changer for an entire region

Indonesia is developing rapidly, but getting certain supplies to the population – flour, for example – is still a pressing issue. In a country with an underdeveloped road infrastructure, tropical climate, and more than 17,500 islands, this is a huge challenge. Food that travels such long distances needs to be well packaged in order to maintain its freshness.

19:28 In a country without a developed road infrastructure, supplies are often shipped by boat.

Usaha Ibu – "Mama's Company" – is only accessible to people in the know. Somewhere in the narrow alleys of Maros, about an hour's drive outside the million-strong Indonesian city of Makassar, is Hajjah Nursiah's unassuming house. Her "company" consists of just one room. She sits regally on a stool, dropping little cylinders of dough into a wok full of hot oil. She has also added sugar to the wok, which has the effect of coating the cylinders with caramel as they fry. The delicacy is called *kacang sembunyi*, and Mama Hajjah, who is in her mid-40s, sells it to people as far away as Makassar.

"I used to have to buy flour for the dough in 25-kilogram sacks," she says. The sack would then sit around open. "That's not good," she explains with a disapproving hand gesture, as a tropical downpour lashes the pavement outside. "The small packages are much better. The packaging protects the flour, so there is no loss of quality. That's important for us," she adds earnestly. The proud small-business owner knows it pays to deliver a good product. She started her operation four years ago. Now,

she employs two neighborhood women. Crouching around a table, they roll peanuts into the strips of dough their boss cranks out of the pasta machine before tipping the next batch into the hot oil.

"Mama's Company" is an example of many Indonesians' fierce determination to take advantage of opportunities even in difficult circumstances. This is a country experiencing rapid change. Long traffic jams are the order of the day in the big cities. Anyone who can afford a car likes to flaunt it. But not all Indonesians enjoy this kind of prosperity. Many have to get by doing odd jobs. Given the insufficient transportation infrastructure, unreliable supplies and fluctuations in the quality of food are not unusual. In Makassar, even getting flour of consistent quality is something that cannot be guaranteed. "Some wholesalers mix cheaper flour into ours to pad their profits. But that damages our brand," says Nick Trim, the Australian general manager of operations at ET Pearl, a huge mill located on the booming city's dockside. This is one of the reasons he cites for ET Pearl's increasing preference for one-kilogram packages. "The contents of these plastic bags cannot be adulterated during shipping to the consumer. You could tell right away if someone had tampered with this," Trim says, with a satisfied smile.

Three machines from Germany fill and seal the bags of flour. The Bosch Packaging Technology machines can process up to 50 units a minute, 24 hours a day. Each bag is also inspected for foreign substances before being loaded into boxes. "Consistently high quality is very important to us," says Rifki Effendi. The chemical engineering graduate from RWTH Aachen University in Germany is responsible for this process. Every day, 150 metric tons of flour are filled into these convenient bags, which are then packed in ten-kilogram boxes. The mill still delivers flour in 25-kilo sacks as well. Roughly three-quarters of the flour has to travel a long way. "Supplies are usually shipped by boat in Indonesia, because that's the only way many regions and, of course, the many islands can be reached," the mill manager Trim explains.

> "Now I can buy the flour in smaller quantities, and can be sure that its quality will always be consistent. That's very important for my company."
>
> Mama Hajjah

In view of the difficult routes and tropical conditions, the one-kilo bags filled by the Bosch machines deliver yet another benefit. "While the flour spoils after six weeks in the conventional 25-kilo sacks, it keeps fresh at least twice as long in small plastic bags," Trim adds. It frequently takes a long time for the flour to reach its final customers. Some of it is taken to the old port and loaded onto small wooden boats whose extended bows are typical of the country.

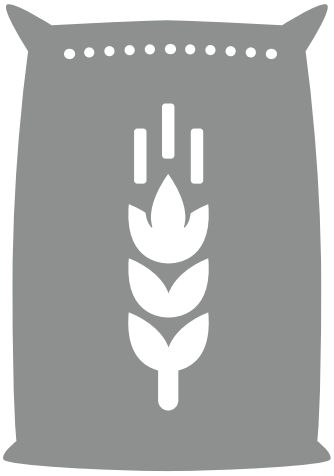
In a country where one in four people live below the poverty line, reliable food supplies are a fundamental condition for political stability. Following several poor harvests in the 1970s, the Indonesian government decided to promote wheat as a staple

40%

of food produced worldwide is lost during production and harvesting, and as a result of improper storage.

83 million metric tons

of grain are produced on average in Indonesia each year.



870 million

people around the world suffer from hunger every day.

81 kg

of food are thrown away by every German man, woman, and child every year, according to government statistics.

foodstuff in addition to rice. Wheat does not grow in the tropics, arriving instead on freighters such as the Hope Star, which takes two weeks to make the voyage from Australia. The Makassar mill, however, also receives shipments from the U.S., Canada, India, and Turkey. “Every day, our people watch the big exchanges where wheat is traded, such as Chicago,” Nick Trim says, describing the Makassar mill’s global strategy. If the price is right, then wheat is bought by the freighter-load.

Using powerful suction hoses, it takes almost 70 hours to remove the 27,000 metric tons of wheat from a freighter’s hold. “That is, if it doesn’t rain,” the shipping manager Mahjuddin adds. “If it does rain, we have to close the cargo areas and wait for better weather; the wheat must not get wet.” And while the Hope Star’s load is gigantic, it is only enough to last the mill two weeks. The ET Pearl facility produces a total of 500,000 metric tons of flour a year, supplying some 25 million people throughout eastern Indonesia. The Makassar mill is one of the largest in the world.

Customers will pay a premium

The one-kilo bags that come off the Bosch packaging lines are also very popular with the wholesaler Haji Ridwan’s customers. In Makassar’s bustling Terong Market, he runs a tiny shop that is packed to the rafters. He has now switched completely to the convenient bags, which are easy to transport in their boxes on a motorcycle or a three-wheeled cargo bike. “Customers even pay a bit more for them,” the shop owner cheerily confirms, stowing a bundle of rupiah in a drawer. People definitely pay more attention to quality now, he notes. “That’s why more and more customers are objecting to having flour scooped out of a large sack,” Ridwan adds with a slightly disapproving nod toward Franciscus Wysyan’s shop.

Wysyan’s single-room establishment is at least as full as Ridwan’s own. Customers have difficulty squeezing past one another. “Not everybody can afford or wants the original flour from the mill,” explains the shopkeeper, as his assistant fills up the next bag with flour from a sack. The exact contents of that sack are a trade secret. Less expensive flour from Indian or Turkish wheat may be mixed in – wheat that is not as hard and protein-rich as the U.S. or Australian varieties. “We also sell those types of flour,” Trim says. But Wysyan’s customers are also

Everyday reality: throughout Indonesia, flour is still bought in bulk, scooped out of large sacks.

Save Food initiative

Bosch Packaging Technology is playing its part

Save Food is an alliance between the UN Food and Agricultural Organization (FAO) and Messe Düsseldorf GmbH. It was launched at Interpack, the leading trade fair for the packaging technology industry, in May 2011. Bosch Packaging Technology was involved right from the start. Since 2013, the initiative has also been supported by the UN Environment Program (UNEP). Its aim is to find ways of preventing the global loss and waste of food. According to the FAO, roughly one-third of all food is lost each year on its route from source to consumer. In the industrialized countries, as much as 40 percent of food perishes after being bought by consumers. In the less developed countries, food loss is more the result of poor harvesting methods, a lack of infrastructure, and poor storage facilities. In China, 45 percent of the rice harvest is lost. For Vietnam, this figure is as high as 80 percent. These huge losses are also a waste of valuable resources such as arable land, energy, and, above all, water.

Packaging can help to improve the transport of food over long distances, and can enable food to be stored without any loss of quality. Appropriate technologies take account of local conditions in countries with insufficient supply infrastructures. In many emerging countries, food is still packed in ways that are inappropriate for end consumers – in large unsterile sacks, for example. With the help of Bosch packaging machinery, sensitive products such as flour, rice, salt, and sugar can be packed hygienically in one-kilogram bags. In this way, food can reach people without any loss of quality.

www.save-food.org

19:51 Franciscus Wysyan's customers are increasingly asking for flour in one-kilo bags.

becoming more discerning: "More and more, we're also switching to the one-kilo bags from the flour mill," he admits. It's all a question of supply and demand – in Makassar just like everywhere else.

Consistent quality and a long shelf life are the goals Nick Trim is particularly committed to. "We want to follow the example Bosch has set with its packaging machinery and support the Food and Agriculture Organization Save Food initiative with our flour," the young Australian says. "I've been here for over a year, and I believe the technology we use can contribute to Indonesia's development." That might sound somewhat idealistic, Trim admits. "But this idea spurs us all on, every day." Usaha Ibu – Mama's Company is one example of this development: "Recently a manager from the French retail chain Carrefour in Makassar expressed interest in my *kacang sembunyi*. Carrefour!" The small-business owner Hajjah Nursiah can still hardly believe it. It looks as if she will soon be able to hire more neighbors and continue her success story. She will be helped by flour packaged on a machine from far-off Germany that was "Invented for life." ❮

11

When the car knows the way better than the driver does

With today's technology on a trip to tomorrow

Technology is getting better all the time, bringing the goal of accident-free driving closer. Even today, more is feasible than many people believe.

UTC +01:00

10:46

Germany, Abstatt

10:26_ “Eighteen months after the start of our project, we have already made significant progress. It has earned us a lot of recognition from automakers, who see us as pacemakers in automated driving.”

Michael Fausten

Bosch – “Invented for life.” The big decals are the only unusual thing about this silver Porsche. At least from the outside. But behind the wheel, driving becomes an unforgettable experience. Inside this Porsche Panamera, everything is different. It’s almost as though an invisible force were at work. The sports car surges into the tight bend, without anyone having touched the pedals. It seems far too fast – but the car brakes in time. The only thing the driver has to do is steer. And no sooner has the Porsche slowed than it picks up speed again, accelerating powerfully out of the bend. The car seems to know the road better than the driver. It knows, for instance, how fast to approach the next bend and where caution is called for. Detecting a speed limit as it drives into a picturesque village to the north of Stuttgart, the car reduces its speed accordingly.

“Now let’s try a sportier mode,” says Adrian Thomys from the passenger seat. With an impish grin, he taps a command into his tablet. As if by magic, the Panamera changes its driving style. Thomys has clearly awoken the Panamera’s sporty side. The Porsche noticeably picks up speed and races much more aggressively through the next bend. Wow! But the relaxed style of driving is actually more pleasant. The engineer’s fingers stroke the tablet, selecting the comfort mode again. The car reverts to a more sedate pace, easing off the gas early and gliding serenely through the next bend. This is really laid-back driving – and not at all hard to get used to.

For Adrian Thomys and his associates at Bosch Engineering GmbH, the Panamera is a kind of test lab on wheels. They use the Porsche to show what today’s standard equipment is capable of. For a year and a half, Thomys and his ten colleagues have been refining the complex interplay of different components on board the Panamera. “Bosch systems in the vehicle, such as the ESP® electronic stability program, ACC adaptive cruise control, satellite navigation systems, and the diesel hybrid powertrain control system will be far more interconnected in the future,” the 33-year-old engineer explains, adding, “I was surprised to see what can be achieved with existing technology. We’ve developed a number of new solutions, including some embryonic features of automated driving.”

It’s clear that Adrian Thomys is totally in his element. “Yes, I’ve found my dream job,” he confirms, and the sparkle in his eyes tells of the passion he brings to his work in this complex field. He first came into contact with driver assistance systems while studying mechanical engineering. “I knew immediately that this was what I wanted to do.”

He wrote his undergraduate thesis on how to combine a GPS device with the vehicle’s control systems. How? The Panamera is fitted with ACC adaptive cruise control, so it can recognize the car in front and automatically keep a safe distance. “Now, eight years later, things have come full circle here at Bosch,” says Thomys with palpable satisfaction.

Despite all the invisible helpers, full concentration is required at the wheel. The Panamera may know the way, but it can’t see what’s around the next bend – yet. Appropriate sensors and the ability to communicate with oncoming traffic would be needed for a car to see around corners. A number of solutions have already been developed, but the aim with the Panamera is to use the technology that is presently available. “This is just a first step. I reckon fully automated driving will be ready for series production in about ten years,” Thomys says.

Thanks to the sophisticated solutions that have been developed, the Panamera hybrid can make even better use of its electric motor, since it knows the course of the road from the navigation system.

10:52 Adrian Thomys and his colleagues demonstrate the things that are already possible on the basis of standard equipment.

In economy mode, it eases off the gas in good time ahead of the next bend, harnessing existing momentum to corner gently and at the same time using braking energy to charge the battery. “In this mode, you can reduce fuel consumption by a good 15 percent,” Thomys explains. This underscores what the real purpose of the converted Porsche is – to find new ways to make driving even more efficient, proactive, and safe, true to the motto emblazoned on the doors.

What does the driver feel, what can be improved? These are the questions that spur the 33-year-old on in his job as keeper of the invisible Panamera helpers. While he spends most of his time at the computer, “it’s important to experience how each new development functions in the real world,” he says.

A dyed-in-the-wool petrolhead, Thomys is already looking beyond the current project. If he had his way, he’d like to set his sights on the next challenge – integrating steering into the already complex system. “Evasive maneuvers while cornering are not easy, even for experienced drivers, and are the cause of many skidding accidents. We could make driving safer here,” says Thomys, simulating the critical driving situation with a hand gesture.

There is still a long way to go before cars can drive completely on their own. Thomys’s Bosch colleagues in the Chassis Systems Control division have been researching the technical requirements for this for roughly two years, together with the algorithms team in Palo Alto, California, and the systems team in Abstatt, Germany. Beneath the Californian sun, they are exploring how to get precise and up-to-the-minute information on road layout and topography into the car. As the example of the Panamera shows, this information is crucial. But at the same time, a vehicle also needs real-time information about what’s happening on the road itself. “That calls for new sensors, control units, and connection strategies in the vehicle,” says the engineer Belén Aranda. “Eighteen months after the start of our project, we have already made significant progress. It has earned us a lot of recognition from automakers, who see us as pacemakers in automated driving,” adds Michael Fausten, the man in charge in this field. Indeed, Bosch is the only supplier testing a highly automated prototype on German autobahns. “Our car accelerates, brakes, steers, and overtakes – at speeds of up to 130 kph,” Fausten explains. He and his team reckon it will be 2020 before the first cars with a high level of automation hit the road. Overland trips or driving in urban traffic will not be possible before 2025. Alongside technology issues, there are also legal questions to be clarified,” his colleague Aranda says. Under current legislation, automated driving would not be allowed.

Adrian Thomys steers the Panamera back to Abstatt, the headquarters of the Bosch Engineering subsidiary. At the entrance to the plant, he crosses paths with a super sports car, one that could be attracting admiring glances on the roads in a year or two. Fine-tuning the handling properties of prototype cars is also everyday routine for the engineers at BEG. “My son would like that car,” says Thomys with a smile. Little Maximilian obviously gets his love of cars from his dad. ❮

UTC –08:00

07:52

USA, Palo Alto

Making journeys safer

The United Nations estimates that rising traffic volumes will claim up to two million lives a year by the end of the decade. The organization's aim is to push the number of victims below one million per year. This will be impossible to achieve without driver assistance systems, as human error is the cause of more than nine out of ten accidents. Assistance functions provide support in critical situations and relieve drivers of monotonous tasks that cause fatigue. Driver assistance systems can already achieve a great deal. That's why the EU and the U.S. have made the ABS antilock braking system and the ESP® electronic stability program – both Bosch innovations – mandatory for all new registrations from 2014. And in the future, achieving Euro NCAP's maximum five-star rating will be impossible without driver assistance systems. Starting from 2014, cars will have to have at least one assistance function to qualify for this rating and, from 2016, predictive pedestrian protection as well.

At Bosch, around 5,000 engineers worldwide are working on the development of safety and driver assistance systems. In 2014, Bosch will be offering a traffic jam assistant that automatically steers, brakes, and accelerates in bumper-to-bumper traffic on freeways. Looking ahead, this will become a congestion pilot capable of automated lane changes. In 2015, Bosch will be launching an expanded parking assistant. The special feature of this system is a remote control that helps maneuver the car in crowded garages. In the future, there will even be a 360-degree video sensor system that lets vehicles find their own space in parking garages.

Parking at the touch of a button: cars will soon be able to get themselves in and out of tight spaces.

Bosch milestones in driver assistance systems

1978 _ World's first production ABS antilock braking system

1980 _ World's first electronically controlled airbag control unit

1989 _ Bosch TravelPilot, Europe's first navigation system

1993 _ Ultrasound-based parking assistant

1994 _ Antilock braking system for motorcycles

1995 _ World's first ESP® electronic stability program

2000 _ Radar-based ACC adaptive cruise control

2008 _ Semi-automatic ultrasound-based parking assistant

2010 _ World's first ultrasound-based blind spot assistant

2010 _ Predictive emergency braking system

2010 _ Traffic sign recognition

2010 _ Lane keeping systems

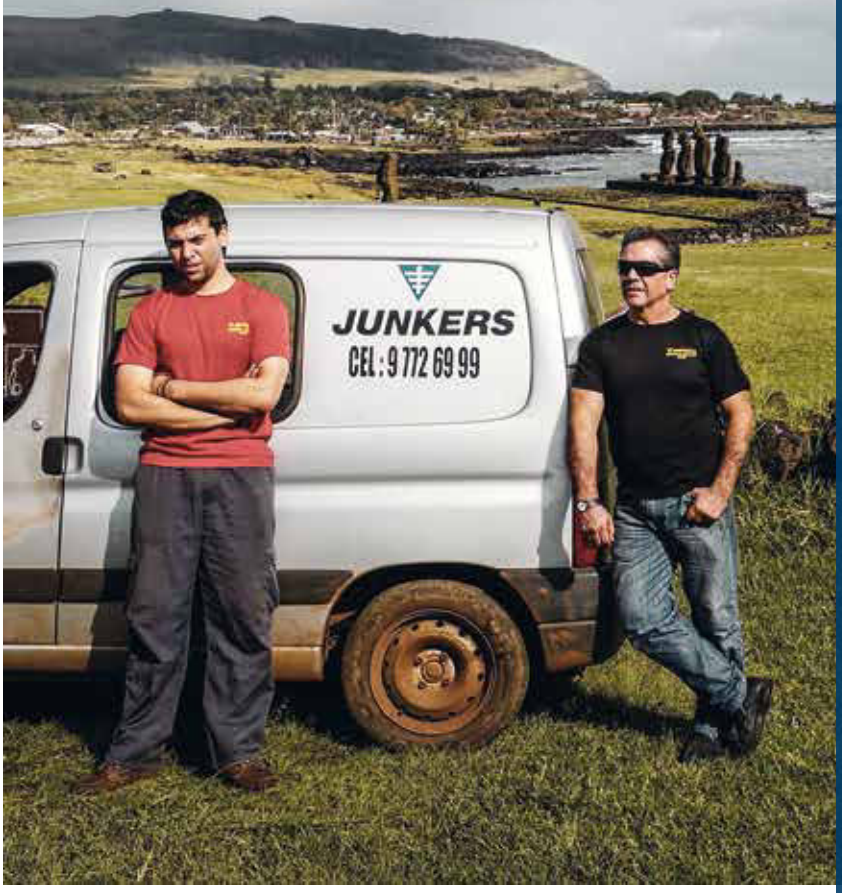
2013 _ iBooster electromechanical brake booster

UTC –06:00

21:47

Chile, Rapa Nui, Hanga Roa

Official language	Spanish
Only town	Hanga Roa
Area	162.5 km²
Population	5,806



12

Unrivalled and robust

Hot water for Easter Island

Competition is not something Luis Diaz has to worry about. Anyone out to poach this heating engineer's customers would have to fly over five hours to get to them. This advantage, however, is limited to an area of 163 square kilometers in the middle of the Pacific Ocean, 3,800 kilometers west of Chile. Luis Diaz and his son Fabian are the only heating engineers on Rapa Nui (or Easter Island).

An athletic man in his mid-40s, Diaz originally hails from mainland Chile, but 16 years ago he ended up on this lonely Polynesian island. It has only 5,800 residents, but Diaz has made a lasting impression on them: "I've probably installed over 3,000 Junkers hot-water heaters. Other brands have become as rare as hen's teeth," the Chilean says with a chuckle. The main reason he has remained so loyal to the brand is the robustness it offers. On Easter Island, the boilers are usually mounted on outside walls, so they have to withstand the damp, salty sea air. "The Junkers systems simply hold up the longest. Who knows, maybe in a few hundred years archaeologists will arrive on the island and find boilers next to our world-famous moai statues," he jokes, pointing to the gigantic, black stone figures which dot the Easter Island landscape in their hundreds. Then he strolls back to his van. It is, of course, emblazoned with just one word: Junkers.

13

Milking the profits

Heating water with gas instead of electricity: an eco-friendly switchover

The lush green, rolling hills are reminiscent of the Shire in *The Lord of the Rings*. No wonder: the movie was shot not quite an hour's drive from here. This location, 130 kilometers south of Auckland, New Zealand, is also home to Scott Bryant's dairy farm. "Around here, people feel very close to nature," Scott says. "Protecting the environment is very important to us." For Scott Bryant and other dairy farmers like him, however, energy is not just an ecological issue but also a matter of cost. Cleansing his milking machines thoroughly takes lots of hot water. Every day, up to 1,200 liters have to be heated to 80 degrees Celsius. He used to heat the water with electricity, which cost 15,000 New Zealand dollars (roughly 9,000 euros) a year. "The new gas-fired hot-water heater saves me about 5,000 dollars. So the investment will have paid for itself within two years," the farmer says with satisfaction.

The idea of equipping dairy farms with gas-fired hot-water heaters was born in neighboring Australia. "There's a lot of entrepreneurial spirit in our team. When a customer told us about the outdated heating systems at the dairy farms, we got straight to work," Mark Blacker recounts. At Bosch Thermotechnology in Melbourne, his job includes looking after the New Zealand project. "We had to make the switchover to gas as quick and easy as possible for the farmers. The cows aren't going to wait until you've finished."

A system can be retrofitted for gas operation within a matter of hours. Using specially developed valves, the new heater can easily be integrated into existing milking machinery.

Carl Steiner also heats with gas: "We start at five in the morning here. At that time of day, you want everything to run smoothly." In the past, the farmer had to start the heating process the evening before. "The new system is much simpler. It goes on automatically at four a.m., and an hour later the water is up to temperature." Scott Bryant agrees: "I save money, plus I can guarantee the best standards in hygiene." ‹

19.1 billion

liters of milk are produced each year in New Zealand.

That's the equivalent of 120 million bathtubs full or one-third the volume of Lake Constance.

4.6 million

cows share the country with 4.5 million people.

10:35

New Zealand, Waitoa

Official languages	English, Maori, New Zealand sign language
Capital	Wellington
Area	269,652 km²
Population	4.5 million

UTC +12:00

14

Revolutionary ease of use for cars and e-bikes

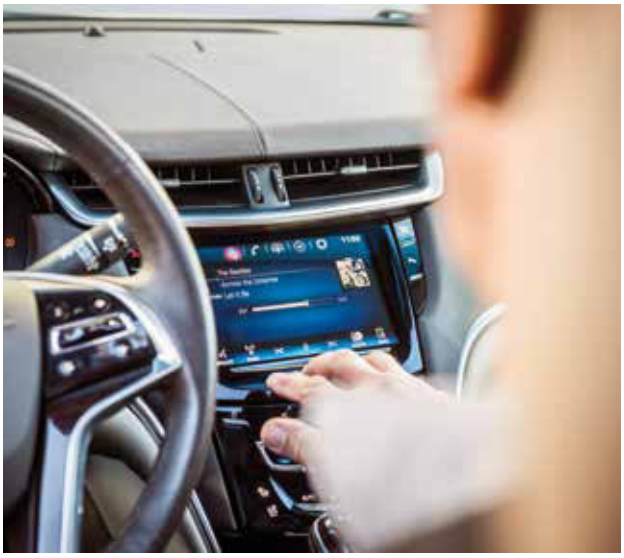
A new generation of GPS devices and bike computers goes beyond customer expectations

What do people want a GPS device to do? How do they communicate with it? What device is best for whom? These were the questions asked at the start of a new development project which resulted in revolutionary innovations.

A turkey float is pulled by a 2014 GMC Sierra during the 2103 Macy's Thanksgiving Day Parade.

08:23 UTC –05:00

USA, New York City



New-generation GPS devices do as they are told. The technology in their U.S. version even "understands" different dialects, from New York to Texas.

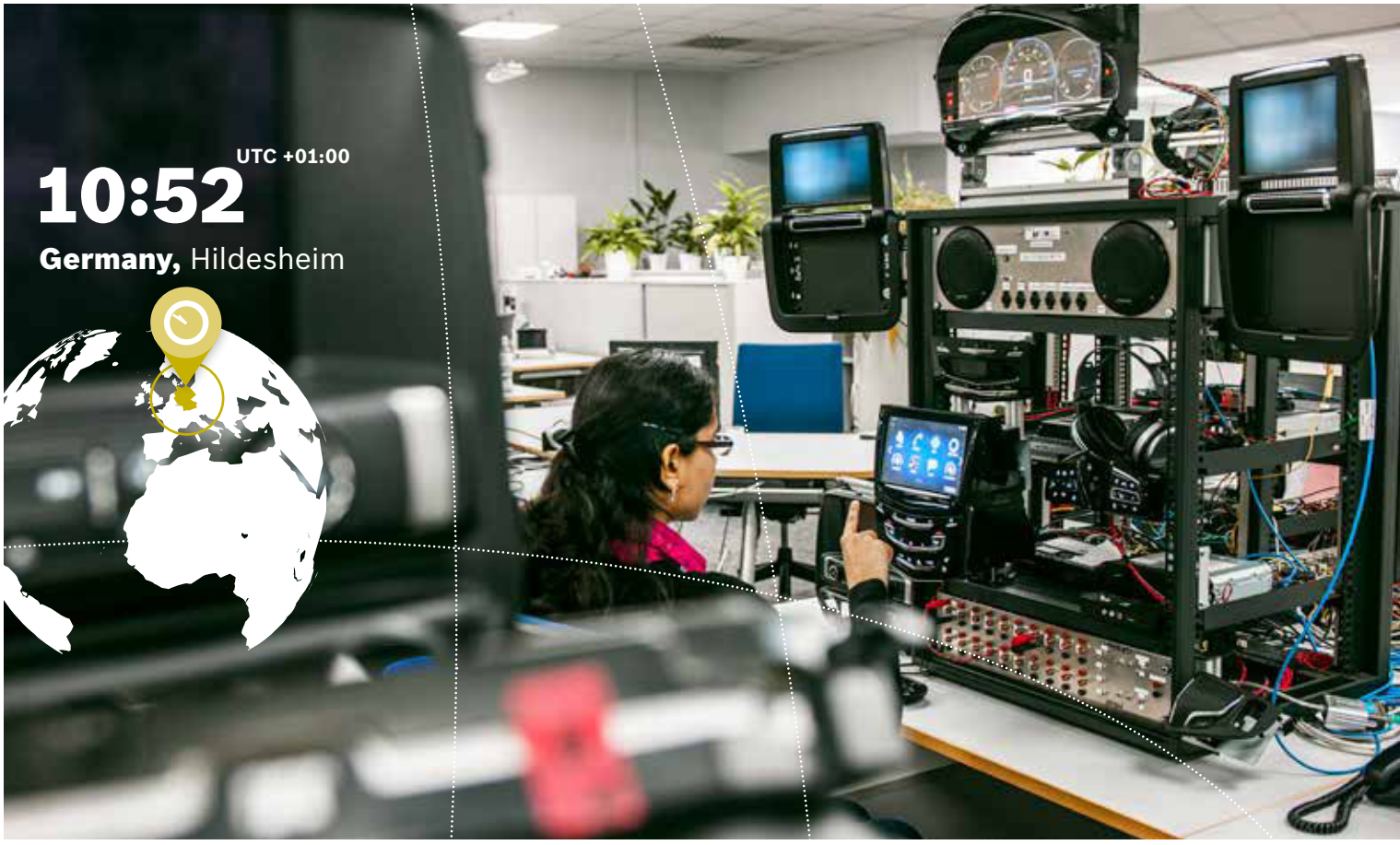
I'm in the mood for some Elvis."The Cadillac reacts promptly to the whim uttered so casually by its owner, Wayne Brooks. No sooner said than done – the strains of *Jailhouse Rock* fill the car as it moves along the urban canyons between New York City's skyscrapers. Wayne turns up the volume slightly with a swipe of his hand. He now wonders, "Any burgers around?" This wish comes true as well; the navigation device shows him several restaurants. With "Take me to Randy's," the best route is calculated and displayed on the screen. Then Elvis carries on crooning.

Voice recognition in itself is not a technological innovation. What is innovative is that Wayne can express his wishes in a conversational tone. And he's not the only one. The instructions Rusty Carter gives in his brawny GMC pickup are followed without a hitch, even though his broad Texas accent would be a challenge for a New Yorker like Wayne to understand. Happy, Rusty cranks up the country song in his GMC, his gloved fingers operating the volume knob easily. "Fancy gimmicks" like the Cadillac's are not for him. The Texas cattle rancher wants a car that fits his character – tough and dependable.

Different worlds, very different vehicles. Under the surface of the Cadillac and the GMC, however, the same technology serves both Wayne and Rusty. Some 1,000 developers at the U.S. car giant General Motors (GM) and at Bosch spent two years working on this platform. Prior to that, interviews with countless end customers were conducted to collate the many characteristic ways people from New York to Texas select a song, make a phone call, or enter a destination into a GPS device. That took an enormous amount of work. "When talking about the enormity of the task, our American partners said, 'We had to eat an elephant, one bite at a time,'" says Matthias Scholz, head of the project at Bosch Car Multimedia in Hildesheim, recalling the groundwork that was as extensive as it was global.

Bosch engineers from Germany, the U.S., India, and China were entrusted with the GM project. The software comprises a grand total of 20 million lines of code. "The previous devices had four million," Scholz says. The teams at both companies communicate on a daily basis. "That's why things only really start hotting up here in Hildesheim in the afternoon," Scholz says, "once our partners on the other side of the Atlantic have arrived at work."

The tangible result of this teamwork is a kind of command center, a central console where information from the car and its surroundings is brought together, and which allows the driver to communicate with the vehicle by speaking or touching a couple of keys. While isolated functions are available in other cars as well,



The design and function of GPS devices are adapted to individual car models.

the capabilities of this new system are unmatched. “That goes especially for natural language voice control, which is currently only available for the U.S. market,” says the Bosch engineer Heiner Schepers. “Our system now features in 16 different GM Group models.” What’s more, over 14 million GM vehicles will be equipped with the Bosch system by 2020.

But this success doesn’t mean the engineers can sit back and relax. Every model has special requirements that reflect the brand designers’ expectations – and, more importantly, those of the end customers. These may include different visual displays or special functions such as the option of operating the device with gloves on. “That’s why we specified especially sturdy knobs for this model,” Scholz says.

No sooner have the Bosch engineers brought a pioneering technology to the production stage than they are already at work on future devices. This means integrating more and more functions, such as on-board assistance systems or information from other road users such as oncoming cars. Added to that are ever-increasing amounts of data from the internet that keep the car’s central unit supplied with up-to-the-minute information. “Soon, our system will be able to load and use apps, too,” Scholz says.

The goals Bosch is pursuing in Reutlingen, Germany, are similarly revolutionary. Bosch is creating a computer for e-bikes that can monitor an e-bike’s electric drive and battery while at the same time providing the rider with a wealth of additional services. In collaboration with Bosch’s own user experience experts, interviews and market observations were used to pinpoint cyclists’ needs, also drawing on experience in the related field of consumer electronics. “On the basis of our findings, we know that navigation, fitness, and range are important elements,” says the product manager Fouad Bennini. “A device like this should also be easy to read and intuitive to operate. But above all, Nyon has to be fun.”

Nyon, on the market since early 2014, is the first all-in-one e-bike on-board computer with a separate control unit. It delivers all the above by checking its position via satellite and providing more than just location information. Not only distance, but also other variables such as topography and cycling behavior, are integrated into the calculations, and the remaining range is displayed on a map.

The device can also connect to a heart rate monitor or smartphone via Bluetooth. This gives the cyclist up-to-the-minute information about calorie consumption, heart rate, and incoming texts or calls. “The only thing I can’t do is make a call – and that’s for safety’s sake,”

Nyon connects e-bikes with the internet, paving the way for many new services.

Bennini says with a chuckle. At home, the cyclist can synchronize the data with a laptop via the internet, share information with friends, and load new maps for the next tour.

The computer is operated via a separate control unit so hands can stay on the handlebars during the ride. Just like the one in the Texas rancher's pickup, this computer was also made to respond to gloved fingers, as cyclists need to use it comfortably in the winter as well. And Nyon is primed for use in other companies' services and business models too. Future versions might be able to display tourist attractions, events, or rest stops along the route. Fouad Bennini knows one thing for sure: "We've gone beyond just giving customers what they want. We're satisfying needs, and in this way creating new markets." ‹

UTC +05:30

13:39

India,
Bangalore

i

Involving the user right from the start

How should the cockpit of an electric vehicle be designed if drivers are to find everything easily? What functions does a power tool have to have for a do-it-yourselfer to be satisfied? When developing products and services, the focus is on the user's perspective right from the start. Engineers ask themselves whether the application is easy to understand, whether the design is appealing, and whether the new solution will stand the test of time. But that's not all. They also take regional differences into consideration. For example, lifting gear for a tractor in India has to be more robust and simpler in design than for a high-end vehicle destined for Europe or the United States. As a rule, repair shops in India are not as well equipped, which means mechanics have to be able to perform maintenance work without too much fuss.

Considering users' needs, experience, and emotions right from the start of the development process is what "user experience" – or UX for short – is all about. A new product or service should be more than just "good enough" – it should wow people. Sparking this enthusiasm is the key to subsequent success.

15

Silent sentinels from Zhuhai

Smoke detectors that work without a hitch

Fires kill people every year. In many cases, a smoke detector could have saved their lives. Millions of these devices come from Zhuhai in China.

Flashing blue lights pierce the darkness as firefighters search for the last remaining pockets of embers. The shock is written all over the Berger family's faces as they stand, wrapped in blankets, in front of their home. A firefighter reassures them: "That was a close call. But the damage isn't too bad. Good thing you had a smoke detector. Without it, this might have ended very badly." The expert isn't just saying that to comfort the Bergers. He knows how disastrous fires can become. In this case, they were lucky to have a silent sentinel that warned them in time.

A forgotten candle, an electrical fault, or a lightning strike: often something very small can have devastating consequences. Around 500 people perish in residential fires each year in Germany alone, with damage to property running into billions of euros. The danger to life is particularly acute when people are asleep. According to official statistics, around three-quarters of home fire fatalities happen at night – which is why smoke detectors are so crucial.

Qinqin Chen watches vigilantly to make sure every smoke detector that leaves the Bosch plant in Zhuhai, not far from Hong Kong, is in perfect condition. She scrutinizes the palm-sized plastic cone, scans the bar code, and places the device alongside others in a transparent box. The box is sealed and carbon monoxide gas streams in. There's a good reason for doing this: when buildings burn, most deaths are the result of smoke inhalation, not contact with the flames. Just a few breaths can be toxic and possibly result in a loss of consciousness or even death due to the high concentration of carbon monoxide. As such, fires present a significant danger even for people who are not in the immediate vicinity of the flames.

Nothing should be left to chance, so every single smoke detector in Zhuhai is individually tested to make sure it goes off when a certain concentration of carbon monoxide is reached. Chen is very well aware of her responsibility. The smoke detectors that pass through her hands are installed all over the world. "I report all discrepancies," she says. "We're not making sneakers here, where a crooked seam doesn't make that much difference. So I'd rather ask too many questions than not enough."

"Our quality controls are very exhaustive, but we need them for maximum reliability," the site manager George Behlke says. Each device is furnished with a bar code to identify it throughout the manufacturing process, and every step in its production is documented. The experts agree: quality like this should also be customers' top priority, because scrimping when it comes to smoke detectors can have very costly consequences.

A total of 1.5 million smoke detectors leave the Zhuhai plant annually; with 1,300 associates, it is the largest manufacturing facility Bosch Security Systems operates. Loudspeakers and video cameras have also been manufactured here since 2008. Motivation at the site is high, as the latest associate survey confirms: this facility had the best results in China and third best in the entire Bosch Group.

Chen was pleased to see that the Chinese government is also concerned with the topic of fire safety. In summer 2013, the authorities launched an awareness-raising campaign. They concentrated their efforts particularly on hotels, restaurants, shopping malls, hospitals, and factories. High-rises, construction sites, and companies that make flammable products were also targeted. "It's a matter of life and death," Chen says. She knows how vital her work is. Robert Bosch, the company's founder, would certainly have approved of her attitude. He once said: "All tasks are important, even the most modest. No one should entertain the notion that their own work is more important than that of the people who work for them. We must all work for the good of the whole." ‹

“We’re not making sneakers here, where a crooked seam doesn’t make that much difference.”

Qinqin Chen

10:02 Hongping Liu is committed to ensuring outstanding product quality.

09:32

UTC +08:00

China, Zhuhai

Official language	Standard Chinese (Mandarin)
Capital	Beijing
Area	9,571,302 km²
Population	1.35 billion

16

A load of fun

The cargo e-bike is revolutionizing inner-city deliveries

E-bikes are increasingly becoming a real alternative for getting around in city traffic. They're fast, fun to ride, and can also be used to transport cargo – as one business owner in Darmstadt, Germany, was happy to discover.

Pedestrians scurry past, businessmen hurriedly gulp down take-out coffee, stressed car drivers honk their horns. Darmstadt may only have a population of 150,000, but the traffic here seems every bit as hectic as in the nearby financial metropolis of Frankfurt. Yet amid the bustle, there is one island of calm. Behind the windows of the "Mondo Daily" restaurant, there's a soothing sense of tranquility. The sweet-spicy smell of curry fills the air of the bistro, mingled with the scents of fresh mint and cumin. An indoor fountain in the shape of a Buddha statue gurgles gently, accompanied by the warm bass tones of electronic lounge music in the background.

In the middle of this peaceful oasis stands a tall man with a shaved head and an infectious smile. Alexander Ernst greets his staff warmly, gesturing animatedly as he talks. From looking at the proprietor of Mondo Daily, you can't tell that he's just back from a 25-kilometer bicycle ride. Sure, the 43-year-old is in good shape, but the fact that his pulse is almost at resting rate as he gets off the saddle is mainly due to the electric motor fitted to his bike. Alexander Ernst rides an e-bike – or to be more precise, an eCargo bike. He uses the electric-powered bicycle not just to commute to work but also to deliver meals to customers. The idea of an e-bike delivery service came to the restaurant owner – naturally – over a meal. "One of the guests at a barbecue I went to arrived on a bright-green cargo bike. Before I knew it, I was hatching a plan to set up a delivery service using just such a bike," Ernst recalls.

The bicycle manufacturers Riese & Müller have been completely won over by e-bikes as well, and have switched over production to them almost entirely. "Five years from now, we reckon most of the bikes sold in Germany will be e-bikes," says the company spokesperson Tobias Spindler. Riese & Müller's own projected growth supports that assessment: in 2014, they plan to boost sales from 9,000 to 14,000 units. "And that's a cautious estimate," Spindler says. Riese & Müller use motors exclusively from Bosch eBike Systems. The Bosch subsidiary, only founded in 2009, is growing at a similar pace to the bike manufacturer. Just 12 months after its launch, it unveiled its first e-bike drive system. Today, Bosch eBike Systems is the European market leader. An automotive supplier in the bicycle business? "The industry eyed us very suspiciously at the beginning," the business unit manager Claus Fleischer recalls. That soon changed, however, as more and more end customers specifically asked for a Bosch drive system.

What's the secret of this success? Fleischer answers without hesitating: "We've got a great team and great products." He points in particular to the special character of the company, which is still in its infancy. The "eBikers" can draw on the Bosch Group's resources and expertise:

UTC +01:00

14:16

Germany, Darmstadt

Alexander Ernst
cycles the 50 kilometers between home and his restaurant every day.

11:42 Eco-friendly transportation: Alexander Ernst uses an e-bike to purchase supplies and deliver his restaurant's specialties.

"Our electronic systems and software, which control the interaction between drive unit and power pack, are what set us apart from our competitors' solutions," Fleischer explains. It's no coincidence that his business unit is part of the Automotive Electronics division, which also produces sensors, semiconductors, and systems for cars, laptops, and smartphones.

With so much expertise behind it, Bosch eBike Systems is already far ahead of traditional bicycle manufacturers. And yet the business has preserved the charm of a start-up. At the company's headquarters in Reutlingen, the predominance of polo shirts instead of ties makes it immediately clear that this is the home of bike lovers and lateral thinkers. Like Alexander Ernst, many of them ride to work on an e-bike – even from Ludwigsburg, 60 kilometers away.

Back in Darmstadt, Alexander Ernst gets back on his bike. He needs fresh ingredients from a Turkish specialty store. There, brightly colored fruit and vegetables gleam temptingly in their crates, and the smell of warm pita drifts over from the bread counter. But Alexander is mainly here for the herbs and spices. His restaurant uses some 15 kilograms of them every week. This time he loads his cargo bike with boxes full of fresh parsley and mint. Outside the store, traffic inches along. It's as hectic as ever, the streets full of angry car drivers and harried pedestrians. Alexander takes in the scene with a bemused look: "I'm glad I don't have to deal with that any more. My e-bike gets me through the traffic much faster. Plus, I don't have to look for a parking space."

The phone rings. A regular customer wants his meal delivered at twelve sharp. Mondo Daily thrives on lunch business; the restaurant gets really busy around midday. The first delivery takes Alexander to a modern office complex with a steel, glass, and concrete façade, where several of Mondo Daily's regular customers work. "Of course, the main reason we order from Alexander is because it tastes good, but we also like the overall concept," one of them says. He means the many fresh ingredients used in the meals, a lot of which are local and organic. What's more, the majority of the dishes are vegetarian or vegan. "And of course the delivery service is eco-friendly, too," the customer adds approvingly.

In his restaurant, it's important to Alexander Ernst that his food be tasty, healthy, and environmentally responsible in equal measure. "My wife's family is from Lebanon. Good cuisine is very important to the people there. They're passionate cooks and eaters." The truth of this statement is obvious when his mother-in-law helps out in the kitchen, lovingly forming falafel balls or seasoning one of her famous curries.

Three portions of that curry have been ordered by the staff of the clothing store that's next on

FALAFEL RECIPE

Ingredients

900 g	dried fava beans, soaked overnight
1 bunch	dill
1 bunch	parsley
1 bunch	cilantro (fresh coriander) or
1 tsp	ground coriander seed
2	onions, finely chopped
1 bunch	scallions
1/2 tsp	each chili powder and cumin
8 cloves	garlic, crushed
	oil for frying
1 pinch	baking powder
2 tsp	sesame seeds
	salt and pepper to taste

Instructions

Preparation time:
approx. 25 minutes

Drain the beans, remove their outer skins, and grind them to a paste in a food processor. Remove the paste to a large bowl. Add the fresh ingredients to the processor and finely chop. Add the bean paste back to the processor along with the spices, salt, and pepper, and process until everything is well blended.

Scoop up small spoonfuls of the mixture, shape them into balls and press flat (roughly 1 cm thick). Sprinkle each falafel with a little sesame and deep fry. They are done when golden brown and the green is no longer visible.

12:20_ “I’m glad I don’t have to deal with that any more. My e-bike gets me through the traffic much faster. Plus, I don’t have to look for a parking space.” Alexander Ernst

Alexander’s delivery schedule. With the precious cargo stowed in the thermobox in front of the handlebars, he cycles through Darmstadt’s pedestrian district. Delivery by car would be impossible here, but many streets are open to bikes. Several deliveries later, Alexander heads off back to the restaurant. Over a cup of hot rooibos tea, he returns to the subject of his cargo e-bike. “I couldn’t do it with a normal bike. The distances are too great and the loads are often too heavy, especially when I’m out buying. But with the e-bike, it’s great.” The restaurant owner is considering buying more bikes. And what if the weather’s bad? “The day before yesterday, it was pouring. But to be honest, riding the e-bike is so much fun I don’t mind the rain,” Alexander says with a grin. ❮

The right boost at all times

The drive solutions produced by Bosch eBike Systems comprise three perfectly synchronized components: the drive unit, the on-board computer, and the power pack. The drive unit is the heart of the system: mounted on the bottom bracket of the e-bike, it houses motor, gear unit, control electronics, and sensors, and provides the right amount of boost exactly when it’s needed. The rider sets the level of electric assistance via the on-board computer. The display supplies further information such as remaining battery time or distance traveled.

The power pack is the muscle of the system: a lithium-ion battery delivering either 300 or 400 watt-hours. Mounted on the luggage rack or frame of the e-bike, it supplies power for up to 150 kilometers. If a greater range is required, the power pack can be recharged to 50 percent capacity within an hour (300 Wh battery) or one-and-a-half hours (400 Wh battery).

The Goliath GP 700 in action in the Mille Miglia rally

17

New “old parts” for the Mille Miglia

Bosch lets the thrill of vintage technology live on

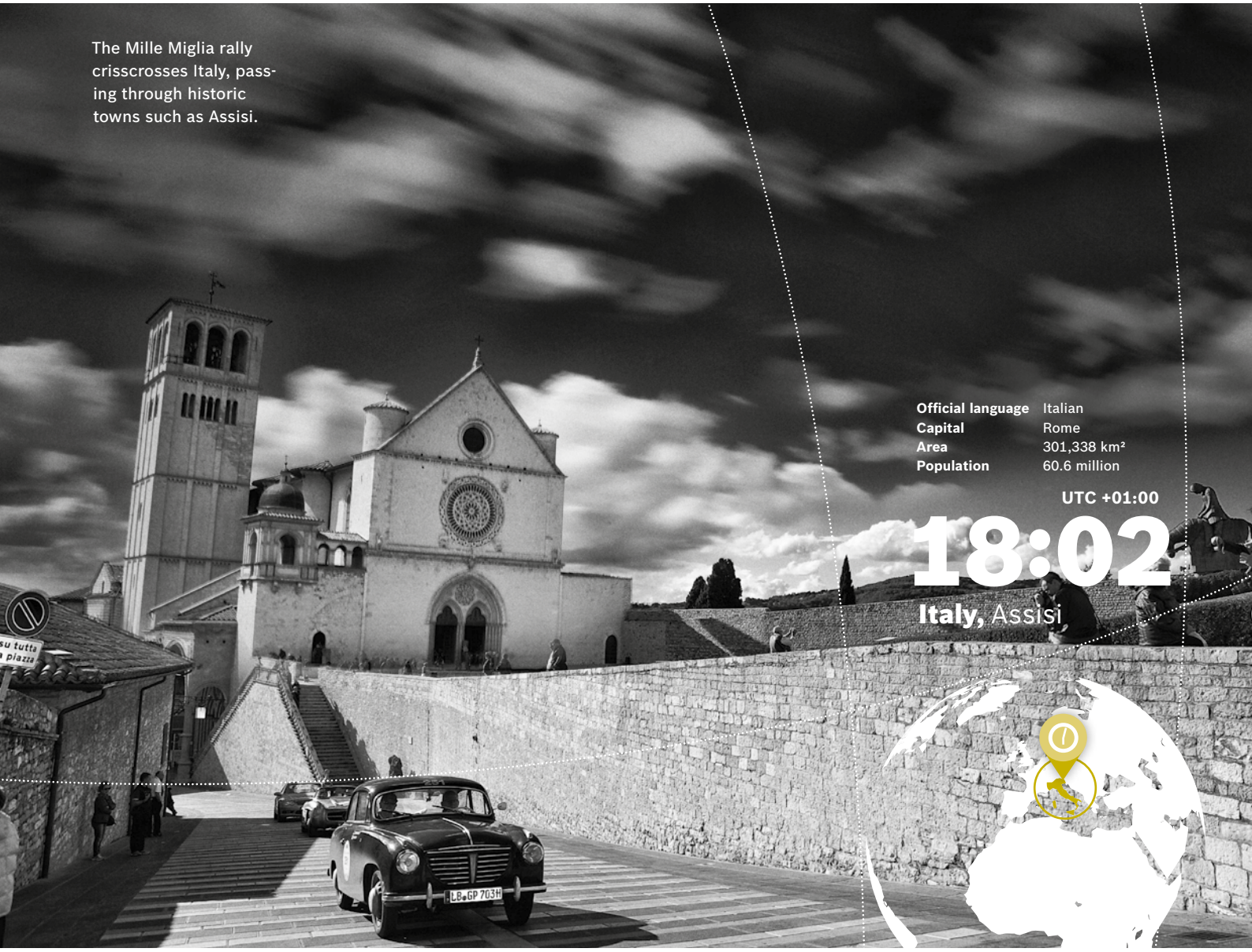
Historic cars awaken memories of times gone by. At events like the Mille Miglia rally, thousands of spectators line the streets. Classic car enthusiasts lavish time and money on their vintage vehicles. The same question preoccupies them all: can I still get spare parts? Bosch usually has the answer they want to hear: yes, you can. Many parts are even rebuilt using original machinery.

UTC +01:00

16:17

San Marino, San Marino

Official language	Italian
Capital	San Marino
Area	60.6 km²
Population	32,471



The Mille Miglia rally crisscrosses Italy, passing through historic towns such as Assisi.

Official language	Italian
Capital	Rome
Area	301,338 km²
Population	60.6 million

UTC +01:00

18:02

Italy, Assisi

Rat-a-tat-tat ... the two-stroke labors up the gentle slope. The name on the steering wheel seems to evoke a lot more power: Goliath. “Now here’s a car that was very much ahead of its time,” Robb Horton explains as he steers the little black car along the country road. The Goliath GP 700 even boasts one of the first Bosch gasoline injection systems, a technological milestone back in 1954. “There are only four of them in running order in the world today,” says Horton proudly. Such a rare gem was exactly what he and his friend Heinz Gerngross were looking for. The two former Bosch associates had a dream: to take part in the Mille Miglia Storica, the annual classic car race between Brescia and Rome, instead of being merely roadside spectators.

After all, not everyone is allowed to join in the “thousand mile” rally across Italy. The organizers have very strict selection criteria. To compete, cars either have to have taken part in one of the original Mille Miglia races from 1927 to 1957, or be the same design and age as one that did.

Last summer, Horton’s and Gerngross’s veteran car passed muster. Since then, the number 251 – its start number for the rally – has adorned the Goliath’s doors. It may not have struck fear into the hearts of the Ferraris, Bugattis, and Mercedes also competing in the race, but the little black car with its 25.5 horsepower still managed to finish 184th out of 450. What’s more, it mastered all the time trials and special stages along the 1,500-kilometer route with flying colors.

In the course of its 127-year history, Bosch has developed and produced more than 750,000 different car parts. Of these, 58,000 are still in its product range.

With painstaking attention to detail, Horton and Gerngross transformed the black car into a veritable jewel. No mean feat, considering the Goliath factory in Bremen where it was built went out of business in 1961, a victim of the Borgward bankruptcy 52 years ago. That means finding spare parts is difficult and calls for technical savvy and serendipity. “We discovered that the VW Beetle and the Porsche 356 used almost the same wheel brake cylinder, and there are still some of those about,” Horton explains with a grin, adding: “Porsche is more expensive, but unfortunately it’s the only part with the right five holes.”

The two Bosch veterans are not the only ones with a passion for old cars: in Germany alone, 4.4 million people live in a household that has a classic car in the garage. According to recent figures from the German Federal Motor Transport Authority, the number of street-legal vehicles in Germany that are at least 30 years old is around 420,000. Then there are 5.8 million “modern classics” built between 15 and 29 years ago. The numbers are rising all the time. “When it comes to spending money on their cars, economic sense doesn’t come into it for a lot of enthusiasts,” says the leading classic car expert Johannes Hübner. According to estimates, the principal market, Europe, is worth around 20 billion euros.

Can I still get spare parts?

But what if the old beauty refuses to fire up just before the classic car rally? Where can you still get a spare part that was designed decades ago – and preferably an original? In situations like these, more and more enthusiasts are turning to Bosch for the right part. The company’s dedicated Automotive Tradition unit, set up in 2005, offers a full information, support, and spare-parts service for vintage vehicles. “Many classic car fans don’t even know that genuine parts still exist,” explains Jochen Geiken. He succumbed to the fascination of classic cars at an early age, borrowing money in 1969, while still a Bosch Car Service apprentice, to buy an MG 1600 Roadster.

Now a master mechanic, Geiken set up his own Bosch Car Service garage in Germany’s Taunus region almost four decades ago. He warns his customers off parts of dubious origin offered on the internet. “The growing demand for spare parts has attracted forgers. A fake part can be a danger to life if it fails

i

Automotive innovation milestones

1902 _ High-voltage magneto ignition system and spark plug

1913 _ Bosch automotive lighting system, comprising headlights, a generator, and a regulator

1914 _ Bosch starter

1926 _ Electric wiper drive

1927 _ Diesel injection pump and injection nozzle

1932 _ First car radio, Autosuper 5

1936 _ Diesel injection system for passenger cars

1951 _ Gasoline injection system as standard equipment for two-stroke engines

1967 _ D-Jetronic electronically controlled gasoline injection system

1973 _ Hybrid prototype based on a Ford Escort

1978 _ Bosch ABS antilock braking system

1995 _ ESP® electronic stability program

1997 _ Common-rail system for passenger cars

2007 _ Direct injection with piezo injectors

2010 _ Predictive emergency braking system

2013 _ First complete electrical powertrain in a production car (motor, power electronics, battery)

at a key moment." People are better off asking the Automotive Tradition professionals. "They're often able to help," Geiken says.

Achim Kschischek is proud of this trust. He's the section head for product marketing at the Automotive Tradition unit in Karlsruhe, Germany. The Automotive Aftermarket division's large central warehouse is located here, and it has an entire unit dedicated to historic parts. Kschischek is responsible for marketing spare parts of older design, from starters to original-specification ignition distributors. At its Karlsruhe spare-parts warehouse, Bosch also stocks parts that were manufactured decades ago. In the course of its 127-year history, the company has developed and produced more than 750,000 different car parts. "We still have 58,000 of them in our range."

Then there are the technical documents, frequently as old as the parts themselves. After compiling them from works archives, customer service records, and automakers' classic car departments, Bosch has scanned the specs and made them available in an online database at www.automotive-tradition.de. "To save costs, many automakers and parts suppliers have thrown out not just the spare parts for old cars but also all the documentation," Achim Kschischek adds. Not so Bosch. True to the spirit of the company founder Robert Bosch, who balked at throwing away even a paper clip, Automotive Tradition has preserved the old spare-parts records.

Yet even at Bosch, stocks are finite. But where demand is so high that rebuilding original parts makes economic sense, orders go to people like Hubert Rapp in Germany's Allgäu region. At the foot of the Bavarian Alps, he and 120 colleagues enjoy breathtaking views reminiscent of a film set. "It's one of the most scenic places to work in Germany," beams the 40-year-old. Rapp's realm in Blaichach is responsible for nine different product families, from series resistors to temperature sensors. Additional parts are made at other sites belonging to the Bosch Automotive Technology business sector. Sometimes a little redesigning has to be done before the "new old" parts are manufactured. This is necessary, for example, for parts that used to contain asbestos, now outlawed. Adhesives today classified as carcinogenic are also out of the question. Plus, technological advances sometimes call for a redesign, as in the case of a phase sensor which was originally designed for a 6-volt battery. Today's cars have 12- and 24-volt circuits. "Even so, we make spare parts for all power requirements – 6, 12, or 24 volts," Rapp says, "and you can rest assured that all the materials we use are completely safe." ❮

10:15 Robb Horton is proud of his British Elva Mark 5 roadster.

Looking for “old” spare parts? Automotive Tradition is the right address.

10:38 Experience and old machinery: in Blaichach, this combination results in new “old parts.”

18

Finding the right washing action boosts convenience and conserves resources

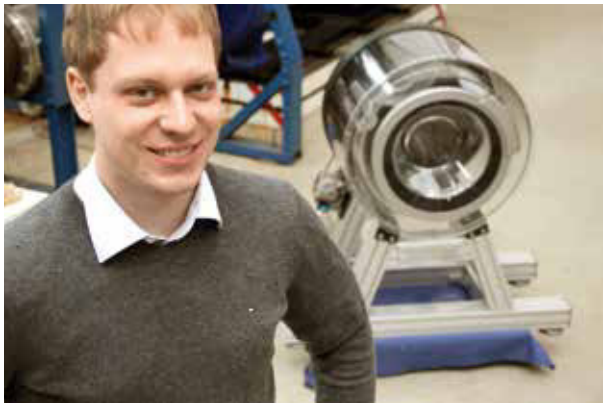
Household appliances are still being fine-tuned to serve customers better

While the Wang family sleeps, their washing machine is hard at work. That's nothing unusual; it's a normal nighttime activity around the world. But in Shanghai, as in many other Chinese cities, residential space is scarce and expensive. As a result, the only place for a washing machine is often the living room. This poses a challenge, though, as the noise from the machine can easily disturb a family like the Wangs as they watch TV or sleep. The spin cycle must therefore be silent as a whisper. Clara Guderez in Seville, on the other hand, has somewhat lower expectations of her machine's decibel level. Like many Spanish families, she keeps her washing machine on the balcony, where it has to be able to cope with the sizzling summer heat and sudden thundershowers.

Using a climate chamber, the experts at the BSH Bosch und Siemens Hausgeräte GmbH technology center in Berlin can simulate these weather conditions. And to develop the whisper-silent spin cycle, the center's purpose-built acoustic laboratory is used. Over 300 different models undergo more than 100 separate tests here. After all, you can always make a good thing better. That's what Bosch has been doing with household appliances for over 80 years. The first refrigerator was launched on the market back in 1933. Remarkable progress has been made since then. Where a washing machine used 250 liters of water per wash cycle in the 1950s, today's machines need just 55 liters – over 75 percent less. And in winter, a dryer with a heat pump is even more efficient than line-drying clothes indoors.

The search for the right washing action, however, is not over. How does the laundry move in the drum? How is the water mixed with detergent? Tobias Morgenthal and his team of students from various Berlin universities use a transparent washing machine to get to the bottom of these questions. "This lets us capture 3D images of the way the clothes move," Morgenthal says, pointing to the cameras positioned on all sides of the machine. Sometimes the movements of a fluorescent object in the machine are additionally observed using black light in a darkened room.

BSH has been collaborating with the Technical University of Berlin, Beuth University of Applied Sciences, and the Hochschule für Technik und Wirtschaft (HTW) in Berlin since 2011. The aim of this joint effort is to expand basic research on laundry care and bring together specialist expertise from various disciplines. For example, the technical university conducts "traditional" technical research in areas as diverse as mechanics, production, flow technology, process technology, electrical engineering, computer science, and environmental protection technology. Part of an applied research project at Beuth University of Applied Sciences in Berlin is devoted to simulating how clothing moves in the rotating drum. In its collaboration with Bosch, HTW Berlin focuses on the drum's contents. Among the aspects analyzed are the sheer diversity and ever more sophisticated processing of modern textiles, and what this means for today's washing machines.



10:38 Using a transparent washing machine, Tobias Morgenthal and his students look at the way textiles move in the drum.

The average household washes four kilograms of laundry per load. But this is rarely done as efficiently as it could be. To help tackle unnecessary waste, the experts at BSH have created an eco-friendly solution: the i-Dos dosing system. "Most people don't realize that they use too much laundry detergent, which means they also use more water than is necessary," Ingo Schulze says. The intelligent dosing system measures just the right amount. All the customer has to do is pour in the correct quantity of detergent and softener for roughly 20 loads – that's it. The i-Dos system saves households 7,000 liters of water each year. Plus, it cuts the amount of detergent needed by 30 percent compared with average use. ‹

UTC +01:00

11:32

Germany, Berlin

250

liters of water were used per wash cycle by washing machines in the 1950s.

55

liters of water are used by modern washing machines.

400

engineers in Berlin are working on making washing machines and dryers quieter, more powerful, and more efficient.

46,000

associates work for BSH Bosch und Siemens Hausgeräte GmbH in 50 countries.

At the BSH technology center in Berlin, over 300 different models undergo some 100 different tests.

Out of this world

Power tools in space

UTC 00:00

13:52

In orbit, International Space Station

Altitude	approx. 400 km
Orbital period	93 minutes
Days occupied	4,772 days
Crew	6

Work in outer space calls for especially easy-to-use and dependable tools. The astronauts on the International Space Station rely on tools from Bosch. The Bosch Power Tools division has been working with Roscosmos, the Russian space agency, to develop special cordless screwdrivers and drills that work reliably even in zero gravity, 400 kilometers above the earth. The astronauts practice using them on the ground at the Roscosmos training center near Moscow. There, a mock-up of the space station has been submerged in a purpose-built pool, which allows the weightlessness of space to be simulated. ❮

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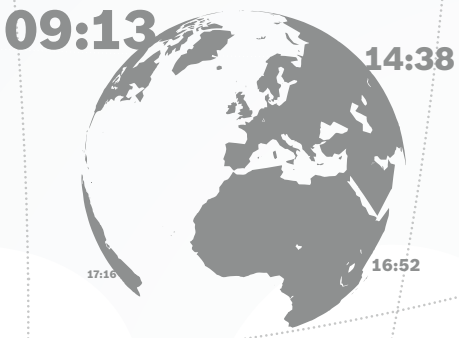
Invented for life



Annual Report **2013**

BOSCH
Invented for life

A.1

The Bosch Vision

Creating value – sharing values

As a leading technology and services company, we take advantage of our global opportunities for a strong and meaningful development. Our ambition is to enhance the quality of life with solutions that are both innovative and beneficial. We focus on our core competencies in automotive and industrial technologies as well as in products and services for professional and private use.

We strive for sustained economic success and a leading market position in all that we do. Entrepreneurial freedom and financial independence allow our actions to be guided by a long-term perspective. In the spirit of our founder, we particularly demonstrate social and environmental responsibility – wherever we do business.

Our customers choose us for our innovative strength and efficiency, for our reliability and quality of work. Our organizational structures, processes, and leadership tools are clear and effective, and support the requirements of our various businesses. We act according to common principles. We are strongly determined to jointly achieve the goals we have agreed upon.

As associates worldwide, we feel a special bond in the values we live by – day for day. The diversity of our cultures is a source of additional strength. We experience our task as challenging, we are dedicated to our work, and we are proud to be part of Bosch.

A.2

Key Data

Currency figures in millions of euros	2013	2012[1]
Sales revenue	**46,068**	**44,703**
percentage change from previous year	3.1	–[3]
percentage of sales revenue generated outside Germany	77	77
Research and development cost[2]	**4,543**	**4,442**
as a percentage of sales revenue	9.9	9.9
Capital expenditure	**2,539**	**2,714**
as a percentage of depreciation	126	101
Associates		
average for the year	279,739	273,091
as of December 31, 2013	281,381	272,830
Total assets	**55,725**	**52,611**
Equity	**27,686**	**26,900**
as a percentage of total assets	50	51
Profit before tax	**2,827**	**3,641**
as a percentage of sales revenue	6.1	8.1
Profit after tax	**1,251**	**2,304**
Unappropriated earnings (dividend of Robert Bosch GmbH)	**88**	**88**

[1] Figures following adjustment for new methods of accounting and valuation
[2] Including development work charged directly to customers
[3] Year-on-year comparison is not meaningful, as figures for 2012 sales revenue have been adjusted

The Bosch Group at a Glance

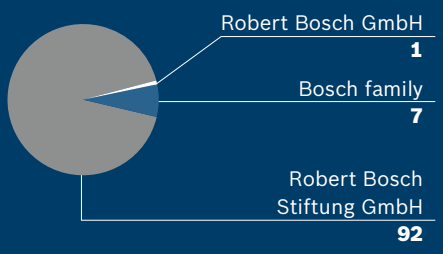
The Bosch Group is a leading global supplier of technology and services. In 2013, its roughly 281,000 associates generated sales of 46.1 billion euros. Its operations are divided into four business sectors: Automotive Technology, Industrial Technology, Consumer Goods, and Energy and Building Technology. The Bosch Group comprises Robert Bosch GmbH and its more than 360 subsidiaries and regional companies in some 50 countries. If its sales and service partners are included, then Bosch is represented in roughly 150 countries. This worldwide development, manufacturing, and sales network is the foundation for further growth.

In 2013, the Bosch Group invested some 4.5 billion euros in research and development and applied for some 5,000 patents. This is an average of 20 patents per day. The Bosch Group's products and services are designed to fascinate, and to improve the quality of life by providing solutions which are both innovative and beneficial. In this way, the company offers technology worldwide that is "Invented for life."

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.

Shareholders of Robert Bosch GmbH

Shareholding



Voting rights

Business sectors with divisions

Automotive Technology
Gasoline Systems
Diesel Systems
Chassis Systems Control
Electrical Drives
Starter Motors and Generators
Car Multimedia
Automotive Electronics
Automotive Aftermarket
Steering Systems[1]

Industrial Technology
Drive and Control Technology[2]
Packaging Technology

Consumer Goods
Power Tools
Household Appliances[3]

Energy and Building Technology
Thermotechnology
Security Systems

[1] ZF Lenksysteme GmbH (50% Bosch-owned); company is included in the financial statements at equity
[2] Bosch Rexroth AG (100% Bosch-owned)
[3] BSH Bosch und Siemens Hausgeräte GmbH (50% Bosch-owned); company is included in the financial statements at equity

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Bosch 2013

B.1

Foreword
to the 2013 Annual Report

Dear Reader,

Our ambition is to spark enthusiasm among our customers with technology that is "Invented for life." The magazine that accompanies this year's annual report illustrates just how diverse a spectrum of products and services this encompasses. For its part, our annual report maps out the objectives and strategy we are pursuing and the progress we are making. To that end, we have restructured the group management report. In the "Fundamental information about the group" section, we showcase our multifaceted areas of business, while in the "Objectives and strategy" section, we use specific examples to explain how we go about that business. The concise "Report on economic position" puts our business figures into clearer perspective, also by comparing all figures with those of the prior year on a like-for-like basis, given that the fifty-fifty joint ventures are no longer proportionately consolidated.

Despite being faced with a difficult economic climate, we made good headway in 2013. Rigorous efforts to cut costs and streamline our processes and structures helped us improve our competitiveness. At the same time, we came closer to achieving our long-term objectives. This was not without making tough strategic decisions, however. Here, I am thinking above all about our parting of ways with crystalline photovoltaics. Yet by selling off part of our photovoltaics business and making plans to relocate some of our own production, we have succeeded in creating job prospects for as many of our associates as possible. That was very important to us.

We believe that competitiveness and excellence in innovation are closely linked. High profitability opens the way for innovative strength to match. By introducing a complex package of measures, we aim to tap into our company's tremendous potential even more effectively – whether this be associates' ideas or the synergies to be gained from cross-divisional collaboration. This is a global endeavor, but one that focuses in particular on our core European market, which is going through a difficult phase. Wherever headcount is in need of adjustment, we are committed to making these changes in as socially acceptable a way as possible. We call this the "Bosch way," and it reflects both our corporate culture as well as the mission handed down by our founder to ensure the company's strong and meaningful development while safeguarding its financial independence.

11:47_ “Scarcely any other company matches Bosch’s depth and breadth of technological expertise. This is why we consider the opportunities for successful development to be good – from a global perspective.”

Dr. Volkmar Denner

Scarcely any other company matches Bosch’s depth and breadth of technological expertise. This is why we consider the opportunities for successful development to be good – from a global perspective – and are engaged in expanding our international presence in all our areas of activity. In our automotive technology business, our substantial investments are paying dividends. One example is the powertrain, where we are enjoying great success with products that help manufacturers meet the stringent Euro 6 emissions requirements. Another example is driver assistance systems, which are paving the way for automated driving. At the same time, our intensive efforts are continuing in the growth field of electromobility, where we have set our sights on becoming one of the leading suppliers. Although our industrial technology business is feeling the impact of the difficult economic environment, this segment still offers attractive prospects. Connected manufacturing looks set to revolutionize industrial production as we know it, and we are involved here as both a supplier and a user. And besides the aspect of energy efficiency, connectivity over the internet is also a driver of growth in our Consumer Goods and Energy and Building Technology business sectors. In this sense, “Invented for life” also stands for interconnected life. An unwavering customer focus is of vital and ever greater importance – in all that we do and wherever we do it.

On behalf of the board of management, I would like to thank all our associates around the world for the achievements and successes they have made possible. We are also very grateful to the employee representatives for their constructive help in finding solutions, as well as to our business partners, shareholders, and supervisory board members for their support.

With best regards,

Dr. Volkmar Denner
Chairman of the board of management

B.2

Board of Management

Top row, from left to right:
Dr. Dirk Hoheisel, Dr. Werner Struth,
Uwe Raschke, Peter Tyroller





Middle row, from left to right:
Dr. Volkmar Denner, Dr. Stefan Asenkerschbaumer

Bottom row, from left to right:
Dr. Stefan Hartung, Dr. Rolf Bulander,
Wolf-Henning Scheider, Christoph Kübel

10:13

Germany, Gerlingen-Schillerhöhe

B.2

Board of Management

Dr. Volkmar Denner
Chairman

Corporate Responsibilities
- Corporate Strategy
- Corporate Communications
- Research and Advance Engineering
- Engineering Coordination
- Senior Executives[5]
- Real Estate and Facilities

Subsidiaries
- Bosch Software Innovations GmbH
- Healthcare Telemedicine
- Bosch Venture Capital GmbH
- Bosch Energy Storage Solutions LLC

Dr. Stefan Asenkerschbaumer
Deputy Chairman[2]

Corporate Responsibilities
- Finance and Financial Statements
- Planning and Management Accounting
- Internal Accounting and Organization
- Purchasing and Logistics
- Information Technology
- In-house Consultancy

Wolf-Henning Scheider

Corporate Responsibilities[2]
- Automotive Group
- Original Equipment Sales
- Marketing and Sales

Divisions
- Chassis Systems Control[1]
- Electrical Drives
- Starter Motors and Generators[1]
- Automotive Aftermarket[2]

Subsidiaries[2]
- ZF Lenksysteme GmbH[3]

Dr. Rolf Bulander[2]

Corporate Responsibilities
- Quality

Divisions
- Gasoline Systems
- Diesel Systems
- Starter Motors and Generators

Subsidiaries
- Bosch Engineering GmbH

Dr. Dirk Hoheisel

Corporate Responsibilities
- Automotive Systems Integration[2]

Divisions
- Chassis Systems Control[2]
- Car Multimedia
- Automotive Electronics

Subsidiaries
- ETAS GmbH

Uwe Raschke

Corporate Responsibilities
- Consumer Goods
- User Experience

Divisions
- Power Tools

Subsidiaries
- BSH Bosch und Siemens Hausgeräte GmbH[3]

Regional Responsibilities
Asia Pacific[1], Western Europe, Central and Eastern Europe, Russia, Middle East, Africa

Dr. Stefan Hartung

Corporate Responsibilities
- Energy and Building Technology

Divisions
- Security Systems
- Solar Energy
- Thermotechnology

Subsidiaries
- Bosch Energy and Building Solutions GmbH

[1] until June 30, 2013
[2] from July 1, 2013
[3] joint ventures previously managed as the "ZF Steering Systems" and "Household Appliances" divisions
[4] from January 1, 2014
[5] until December 31, 2013
[6] from April 1, 2013
[7] until March 31, 2013

Christoph Kübel

Corporate Responsibilities
- Human Resources and Social Welfare, incl. Senior Executives[4]
- External Affairs, Governmental, and Political Relations
- Legal Services and Compliance
- Taxes
- Internal Auditing
- Intellectual Property
- Insurance

Peter Tyroller

Corporate Responsibilities[1]
- Original Equipment Sales
- Marketing and Sales

Divisions[1]
- Automotive Aftermarket

Regional Responsibilities[2]
Asia Pacific, India

Dr. Werner Struth

Corporate Responsibilities
- Industrial Technology[2]
- Manufacturing Coordination, Production System Development, and Investment Planning
- Environmental Protection

Divisions
- Drive and Control Technology
- Packaging Technology

Regional Responsibilities
North America, South America

Dr. Bernd Bohr[1]

Corporate Responsibilities
- Chairman, Automotive Group
- Automotive Systems Integration
- Quality

Divisions
- Gasoline Systems
- Diesel Systems

Subsidiaries
- Bosch Engineering Systems GmbH
- ZF Lenksysteme GmbH[3]

Regional Responsibilities
India

Presidents of the Divisions

Manfred Baden
Car Multimedia[2]

Henning von Boxberg
Power Tools

Dr. Rolf Bulander
Gasoline Systems[1]

Uwe Glock
Thermotechnology

Dr. Steffen Haack
Solar Energy[6]

Robert Hanser
Automotive Aftermarket[1]

Holger von Hebel
Solar Energy[7]

Dr. Markus Heyn
Diesel Systems

Gert van Iperen
Security Systems

Dr. Ulrich Kirschner
Starter Motors and Generators

Friedbert Klefenz
Packaging Technology

Klaus Meder
Automotive Electronics

Stefan Seiberth
Gasoline Systems[2]

Gerhard Johannes Steiger
Chassis Systems Control

Dr. Bernhard Straub
Electrical Drives[4]

Dr. Uwe Thomas
Car Multimedia[1]
Automotive Aftermarket[2]

Dr. Karl Tragl
Drive and Control Technology

Dr. Udo Wolz
Electrical Drives[5]

B.3

Supervisory Board Report

Ladies and gentlemen,

The Bosch Group can look back on a year in which, despite some difficult decisions, we came closer to the objectives we have set ourselves.

As supervisory board members, we are obliged by law and the statutes to fulfill a number of tasks – an obligation which we fulfilled once more with the utmost care in fiscal 2013. We regularly monitored the work of the board of management and, in an advisory capacity, supported it in its management tasks, in its work to further develop the Bosch Group strategy, and above all, in its efforts to put critical elements of that strategy into practice. This collaboration took place in an atmosphere of trust and of open, constructive exchange. Both the supervisory board and the board of management share the objective of securing the Bosch Group's sustainable development, so that it is successful over the long term. In this way, we fulfill the mission handed down to us in the will of the company founder, Robert Bosch. Beyond the meetings of the supervisory board, the chairman of the supervisory board had the chairman of the board of management inform him about current developments and events of relevance for the company.

The exit from crystalline photovoltaics is a watershed for the Bosch Group. The supervisory board had the rationale behind this decision presented to us in detail, and discussed it at length with the board of management. Our consultations also focused on the fundamental strategic direction of the Bosch Group, looking in depth at the future opportunities in mature markets such as Europe and North America, as well as in the global growth regions of Asia and South America. One issue in this context was safeguarding existing business and the creation of additional opportunities for growth as a result of connectivity over the internet of things and services. The supervisory board devoted special attention to the integration of the diagnostics business of SPX Corporation, acquired at the end of 2012, and to driver assistance systems as a preliminary stage of automated driving.

In 2013, the newly composed supervisory board looked in detail at the financial and capital expenditure plans drawn up by the board of management, and also at risk management issues. The board of management also reported on major individual risks. There was no evidence of existential risks. The auditor also examined the structure and function of the risk management system, and raised no objections.

14:15_ “Last year, the Bosch Group took a number of steps that were important for improving competitiveness and for staking a claim to future areas of business.”

Franz Fehrenbach

PricewaterhouseCoopers Aktiengesellschaft Wirtschaftsprüfungsgesellschaft (PwC) audited and issued an unqualified audit opinion on the Robert Bosch GmbH annual financial statements, the Bosch Group consolidated financial statements, and the accompanying management reports as of and for the year ended December 31, 2013. The supervisory board discussed these documents at length and subjected them to its own examination. All members of the supervisory board had access to the auditor’s reports. Moreover, at the supervisory board meeting, the auditor reported on the main findings of the audit, which were then discussed in detail in the auditor’s presence. The supervisory board raised no objections, concurred with the results of the audit, and approved the Robert Bosch GmbH annual financial statements and the Bosch Group consolidated financial statements. The supervisory board recommended that the shareholders adopt the annual financial statements, approve the consolidated financial statements, and endorse the board of management’s proposal for the appropriation of net profit.

The supervisory board would like to thank the board of management and all Bosch Group associates for their dedication and hard work over the past year, as well as for the many ideas that will sustain the company’s continuing success.

Stuttgart, March 2014
For the supervisory board

Franz Fehrenbach
Chairman

B.4

Supervisory Board

Franz Fehrenbach
Stuttgart
Chairman
former Chairman of the Board of Management of Robert Bosch GmbH

Alfred Löckle
Ludwigsburg
Deputy Chairman
Member of the Works Council of the Schwieberdingen Plant, and Chairman of the Central Works Council as well as of the Combined Works Council of Robert Bosch GmbH

Christiane Benner
Frankfurt
(from March 22, 2013)
Managing Partner on the Executive Board of Industriegewerkschaft Metall

Dr. Christof Bosch
Königsdorf
Spokesperson for the Bosch family

Christian Brunkhorst
Mühltal
Representative of the Chairman of Industriegewerkschaft Metall

Klaus Friedrich
Lohr
Chairman of the Works Council of Bosch Rexroth AG, Lohr am Main, Chairman of the Central Works Council of Bosch Rexroth AG, and Member of the Combined Works Council of Robert Bosch GmbH

Hartwig Geisel
Leinfelden-Echterdingen
Chairman of the Works Council of the Feuerbach Plant and Deputy Chairman of the Central Works Council as well as of the Combined Works Council of Robert Bosch GmbH

Jörg Hofmann
Esslingen
Co-chairman of Industriegewerkschaft Metall, Frankfurt

Prof. Lars G. Josefsson
Stockholm
former President and Chief Executive Officer of Vattenfall AB

Dieter Klein
Wolfersheim
Chairman of the Works Council of the Homburg Plant and Member of the Central Works Council of Robert Bosch GmbH

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

Prof. Dr. Hermut Kormann
Ulm
(until March 22, 2013)
former Chairman of the Board of Management of Voith AG

Prof. Dr. Olaf Kübler
Zurich
former Director, Eidgenössische Technische Hochschule (ETH) Zurich

Matthias Georg Madelung
Munich
Member of the Board of Trustees of Robert Bosch Stiftung GmbH

Kerstin Mai
Hildesheim
(from March 22, 2013)
Chairperson of the Works Council of Robert Bosch Car Multimedia GmbH, Hildesheim, and Member of the Combined Works Council of Robert Bosch GmbH

Dr. Wolfgang Malchow
Pliezhausen
former Member of the Board of Management of Robert Bosch GmbH

Daniel Müller
Metzingen
(until March 22, 2013)
Chairman of the Works Council of the Reutlingen Plant and Member of the Central Works Council of Robert Bosch GmbH

Urs B. Rinderknecht
Zurich
former Chief Executive of UBS AG

Wolf Jürgen Röder
Hofheim/Taunus
(until March 22, 2013)
former Executive Director, Otto Brenner Stiftung der Industriegewerkschaft Metall, Frankfurt

Tilman Todenhöfer
Madrid
Managing Partner of Robert Bosch Industrietreuhand KG

Dr. Richard Vogt
Bühl
Department Head, Deployment of Business Excellence, Electrical Drives Division, Chairman of the Central Executives Committee of Robert Bosch GmbH, and Chairman of the Combined Executives Committee of the Bosch Group in Germany

Prof. Dr. Beatrice Weder di Mauro
Frankfurt
(from March 22, 2013)
Chair of International Macroeconomics at the Johannes Gutenberg University of Mainz

Hans Wolff
Bamberg
Chairman of the Works Council of the Bamberg Plant and Member of the Central Works Council of Robert Bosch GmbH

Industrial Trust and International Advisory Committee

Robert Bosch Industrietreuhand KG

General partners

Franz Fehrenbach
Stuttgart
Chairman of the Shareholders Meeting

Tilman Todenhöfer
Madrid

Limited partners

Dr. Christof Bosch
Königsdorf

Dr. Siegfried Dais
Stuttgart

Dr. Volkmar Denner
Pfullingen

Dr. Jürgen Hambrecht
Ludwigshafen

Prof. Lars G. Josefsson
Stockholm

Prof. Dr. Olaf Kübler
Zurich

Dr. Michael Otto
Hamburg

Urs B. Rinderknecht
Zurich

Robert Bosch International Advisory Committee

Franz Fehrenbach
Stuttgart
Chairman

Dott. Alessandro Benetton
Treviso

Dr. Hugo Bütler
Zurich

HRH Prince El Hassan bin Talal
Amman

Prof. Ryozo Hayashi
Tokyo

Baba N. Kalyani
Pune

Dr. Henry A. Kissinger KCMG
Washington

Friedrich Merz
Düsseldorf

Ingo Plöger
São Paulo

Dr. Hans-Friedrich von Ploetz
Berlin
(until December 31, 2013)

Erwin Schurtenberger
Ascona, Beijing

Louis Schweitzer
Paris

Prof. Dr. Igor Yurgens
Moscow
(from January 1, 2014)

B.5

Highlights 2013 – January to June

Jan. 7
Las Vegas, USA

Bosch at the CES trade show
Quality, communication, cost optimization, and collaboration are fundamental requirements for Bosch products and solutions in a connected world.

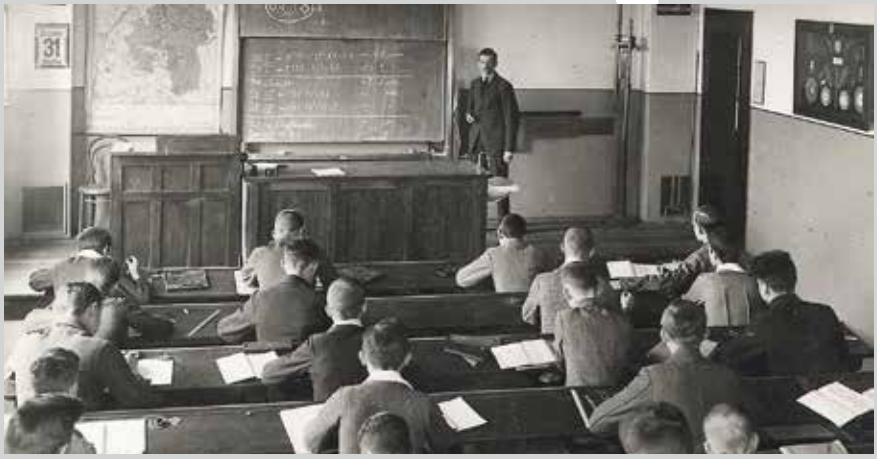
Dr. Werner Struth

Jan. 15
Stuttgart, Germany

10 millionth common-rail system for commercial-vehicle engines manufactured

Feb. 21
Tokyo, Japan

Toyota presents "Global Contribution Award" for outstanding performance
Quality, communication, cost optimization, and collaboration as outstanding strengths



Occupational training is not just about sound theoretical knowledge, but also team spirit.

The Bosch apprentices workshop, 1925: lesson in the technical classroom

Mar. 14
Stuttgart, Germany

Bosch is the world's most admired automotive supplier.
"Fortune" magazine ranks Bosch first on nine reputation criteria in the "automotive supplier" category: innovation, people management, use of assets, social responsibility, management quality, financial soundness, long-term investment, quality of products and service, and global competitiveness.

Apr. 1
Stuttgart, Germany

Apprentice training celebrates 100th anniversary: Bosch offers occupational training worldwide.
Since 1913, some 100,000 young men and women worldwide have begun their career with an apprenticeship at Bosch. Worldwide, the company is training around 6,100 young people at present, some 4,300 of them in Germany.

Apr. 5
Yangon, Myanmar

Bosch opens sales office in the Myanmar capital Yangon.

Regional president Martin Hayes *(6th from left)* and associates

Shown here: Christoph Kübel, Alfred Löckle, Hartwig Geisel, Dr. Volkmar Denner *(from left to right)*

Apr. 17
Bad Kissingen, Germany

More than 200 works council representatives meet with the board of management to discuss the Bosch Group's competitiveness.
Employee representatives from 31 German locations have the opportunity to talk with Dr. Volkmar Denner, the chairman of the board of management, and Christoph Kübel, the director of industrial relations.

May 15
Porto, Portugal

Franz Fehrenbach: Europe faces immense challenges
The International Advisory Committee and members of Robert Bosch Industrietreuhand KG and the board of management meet to discuss Europe's future. The guests include high-caliber Portuguese politicians, including President Anibal Cavaco Silva.

Franz Fehrenbach *(4th from right)* and guests

May 17
Geneva, Switzerland

Award from the International Telecommunication Union (ITU)
Dr. Volkmar Denner, the chairman of the Bosch board of management, is presented with the 2013 World Telecommunication and Information Society Award. The award pays tribute to Bosch's efforts to improve road safety.

Dr. Volkmar Denner *(left)* and
ITU Secretary-General Dr. Hamadoun I. Touré

Jun. 13
Boxberg, Germany

Bosch is shaping the future of cars
At the Automotive Press Briefing, some 300 motoring journalists from 37 countries are able to judge this for themselves at the proving ground in Boxberg. For the first time, they can see automated driving in action, and get to know new developments in assistance systems that improve pedestrian safety or make driving in the narrow lanes of construction zones less stressful.

Jun. 19
Sindelfingen, Germany

Wissensfabrik members meeting
In June 2013, Franz Fehrenbach *(left)*, chairman of the supervisory board und chairman of the shareholders meeting of Robert Bosch Industrietreuhand KG, assumes the chair of the Wissensfabrik (knowledge factory) from Dr. Jürgen Hambrecht, limited partner of Robert Bosch Industrietreuhand KG and former chairman of BASF SE. Wissensfabrik is an initiative of German companies to promote training for young people and support start-ups.

Highlights 2013 – July to December

Jul. 22
Gerlingen, Germany

Inventors of the year
At corporate headquarters, tribute was paid to seven of the most successful Bosch inventors. Worldwide, Bosch files 20 patents per working day.

The Bosch inventors 2013 celebrate with Dr. Volkmar Denner *(6th from left)* und Christoph Kübel *(far right)*.

Jul. 23
Berlin, Germany

Bosch is fostering young talent in Africa.
Bosch is one of 19 companies fostering budding business leaders in Africa with the "Afrika kommt!" initiative. Federal President Joachim Gauck, the initiative's patron, praised the program, which is co-organized by Tilman Todenhöfer, managing partner of Robert Bosch Industrietreuhand KG.

Aug. 28
Friedrichshafen, Germany

Bosch eBike Systems at Eurobike trade show

Sep. 10
Leinfelden, Germany

Smallest laser rangefinder launched
PLR 15, based on single-photon avalanche diode technology

Sep. 12
Frankfurt, Germany

Bosch at IAA Cars
Dr. Volkmar Denner *(right)*, chairman of the board of management, presented the broad portfolio of Bosch products for electromobility to Federal Chancellor Angela Merkel and Matthias Wissmann, the president of the German Association of the Automotive Industry. The Bosch portfolio ranges from motors to power electronics and batteries.

Sep. 20
Stuttgart, Germany

Topping-out ceremony in Renningen
By 2015, the new research campus on the outskirts of Stuttgart will be the new hub of the Bosch Group's global research and advance engineering activities.

From left to right: chief architect Albrecht Fischer, Mayor Wolfgang Faisst, Councilor Roland Bernhard, R&D President Dr. Klaus Dieterich

Sep. 23
Abstatt, Germany

Christoph Kübel presents awards to plants with especially ingenious associates.
This year, first prize went to the Charleston plant.

The 2013 award-winners with Christoph Kübel *(8th from left)*

Nov. 15
Grasbrunn, Germany

New DCN multimedia conference system
It transmits audio, video, and data to the delegate's seat.

Nov. 20
Frankfurt, Germany

Best annual report
Interconnected and invented for life – this was the theme of the 2012 Bosch annual report. It earned the company first prize in the overall ranking of the Public Private Award, which is given to the best annual report by an unlisted family- or foundation-owned company.

Dec. 12
Principality of Monaco

Monaco and Bosch are working on tomorrow's connected city.
Bosch presents solutions for networking systems relating to mobility, energy, security, and communication. The aim is to make Monaco a highly connected city by 2015.

Dec. 13
Stuttgart, Germany

Bosch sets up new company for the internet of things and services.
Bosch Connected Devices and Solutions GmbH offers customized devices and complete connectivity solutions for different areas of application, above all smart homes, transportation, logistics, and traffic.

Dec. 19
Berlin, Germany

German Future Prize for development of highly precise ultrashort pulse laser
Federal President Gauck paid tribute to the winners. Shown here from left to right: Dr. Dirk Sutter (Trumpf), Dr. Volkmar Denner (Bosch CEO), Dr. Jens König (Bosch research), Dr. Hermann Scholl (honorary chairman of the Bosch Group), and Prof. Dr. Stefan Nolte (University of Jena) in Berlin with the winners' trophy.

B.6

Robert Bosch Stiftung

Since it was set up 50 years ago, Robert Bosch Stiftung GmbH has been carrying on the charitable and social endeavors of the company's founder in contemporary form. It pursues its specific objectives with programs and institutions of its own. It also supports external projects and initiatives if their objectives are congruent with its own. Each year, the Robert Bosch Stiftung approves funding for some 800 projects.

changemakerXchange: Young social entrepreneurs from Europe, Turkey, and North Africa want to use their ideas to solve social, ecological, and societal problems.

The Robert Bosch Stiftung focuses its funding activities on healthcare, science, education, and international relations. Its aim is to find possible solutions for relevant issues, and to test them in the field as models. When selecting and designing projects, the values and mission of Robert Bosch provide the main point of reference. The Stiftung finances its work from the dividend it receives as a shareholder of Robert Bosch GmbH. It develops ideas for improving people's situation and coexistence, and ensures that results of these projects can be applied as widely as possible. Just like the company, the Stiftung is committed to delivering high-quality results whose effect is lasting.

Encounter and dialogue

One of the aims of the Robert Bosch Stiftung is to help bring together people of different origins to engage in dialogue. This gives rise to mutual understanding, which is the basis for joint action and bringing about positive change. Typical examples of the programs it supports include international scholarship programs, exchange programs for young executives, media forums, and exchanges among lawyers.

Right from the start when it was set up in 1964, the Stiftung engaged in international activities with projects to bring about reconciliation between Germany and France. This was an objective pursued by Robert Bosch himself in the years after the first world war. Today, the Robert Bosch Stiftung is active in every European country, as well as in the U.S., China, Japan, and India.

Often, cultural projects are a good way of breaking the ice and creating intercultural understanding. In 2013, for example, the Robert Bosch Stiftung reacted to the Arab Spring by endowing a film prize for German-Arab coproductions. Its "Szenenwechsel" (change of scene) program also encourages cooperation between theater groups in Germany and partners in eastern Europe and North Africa.

These international programs celebrated an anniversary in 2013: this was the tenth year that the Stiftung had been giving research grants to authors in its "Grenzgänger" (border-crossing) program. This has so far resulted in 110 works. The "Literarische Brückenbauer" (literary bridge-builders) program is also ten years old. It aims to better qualify and network translators. These translators translate literature from central and southern European languages

Katja Pressl taught German for three years at universities in China. In September 2013, to mark the 20th anniversary of the assistants program at eastern European and Chinese universities, she and other program alumni took the assistants' train from Krzyzowa to Berlin.

into German and vice versa. In this way, they are important cultural ambassadors. The assistants program, whose young German participants are currently working in universities in eastern Europe, Russia, central Asia, the Caucasus, and China, has been running for 20 years now.

Commitment and reforms

"Neulandgewinner" (pioneers of new lands) is the name of a new program that looks into the consequences of an aging society. Parts of eastern Germany are experiencing an exodus, giving rise to problems that will affect huge swaths of Germany in twenty or thirty years. In these regions, the Stiftung is supporting and supervising twenty projects by committed citizens. They are using their initiative and unconventional ideas to counter these problems.

Once again, the presentation of the German School Prize was a special highlight in 2013. In June, Federal Chancellor Angela Merkel presented the prize to the Anne Frank School in Bargteheide. The school is a good example of how sound academic achievements are possible without leaving pupils by the wayside. Teachers there encourage their pupils to push themselves to achieve more than they thought possible. This motivates them to grow and excel academically. It is a model for many other schools.

The "Du hast die Macht" (you have the power) internet portal gets political issues across to young people who have for the most part dropped out of the conventional school system. For the 2013 German national elections, the portal staged a rap competition, which garnered a number of awards.

The Stiftung has relaunched the European Palliative Care Academy, a further training scheme for specialists caring for terminally ill patients. The scheme is being attended by 20 participants from 14 European countries. They are shadowing colleagues at four leading academic centers in Cologne (Germany), London (U.K.), Bydgoszcz (Poland), and Brasov (Romania). The best-practice examples they see there give them new ideas for improving their own work. The training course lasts a total of 600 hours, including training sessions and a personal project.

Science and research are important for safeguarding the viability of our societies and contributing to resolving global problems. For this, we also need to draw on the potential of highly qualified women. With "AcademiaNet," its internet portal, the Stiftung helps to ensure that more and more women from all over Europe are appointed to leading positions in the academic world.

Total project grants by Robert Bosch Stiftung Figures in millions of euros	**2013**
Healthcare and science	12.4
Education, society, and culture	16.5
International relations: Americas and Asia	7.6
International relations: Europe and its neighbors	13.6
Projects by the Berlin liaison office to promote international relations	2.8
Special area: healthcare issues of the future	0.3
Research at institutes[1] and the hospital	8.7
Investments in the Robert Bosch Hospital	5.5
Dependent foundations	2.1
Total	**69.5**

[1] Dr. Margarete Fischer-Bosch Institute for Clinical Pharmacology, Institute for the History of Medicine of Robert Bosch Stiftung

The following institutions also belong to the Stiftung:
- Robert Bosch Hospital,
- Dr. Margarete Fischer-Bosch Institute for Clinical Pharmacology,
- Institute for the History of Medicine, and
- UWC Robert Bosch College.

Dependent foundations within the Robert Bosch Stiftung:
- Otto und Edith Mühlschlegel Stiftung (aging),
- Hans-Walz-Stiftung (research into complementary medicine),
- DVA-Stiftung (Franco-German dialogue), and
- Rochus und Beatrice Mummert Stiftung (international promotion of young talent).

For more information online: www.bosch-stiftung.de

C

Group Management Report

Overall, 2013 was a positive year for the Bosch Group. Despite the weak economic environment, it managed to increase both sales and earnings. This accomplishment was due partly to innovative products in all business sectors, and partly to a rigorous focus on costs. The Automotive Technology business sector was particularly successful, while Industrial Technology was severely impacted by the tough environment in the mechanical engineering industry. In addition, important strategic groundwork was laid. This included developing the new Energy and Building Technology business sector, realigning the battery businesses for electric cars, and increasingly taking advantage of the potential for connecting products and services over the internet. We also withdrew from the crystalline photovoltaics business. In some cases, its activities are presented separately in this report. The change in the way we consolidate our fifty-fifty joint ventures also had a substantial impact on the way figures are presented. They are no longer included on a pro-rata basis in the consolidated financial statements using the proportionate consolidation method. Instead, they are recognized using the equity method. That is to say that their pro-rata share of equity is reported on the statement of financial position and their after-tax income is reported in operating profit. The 2012 data have been adjusted accordingly.

F.01

Business sectors with divisions

Automotive Technology
Gasoline Systems
Diesel Systems
Chassis Systems Control
Electrical Drives
Starter Motors and Generators
Car Multimedia
Automotive Electronics
Automotive Aftermarket
Steering Systems [1]

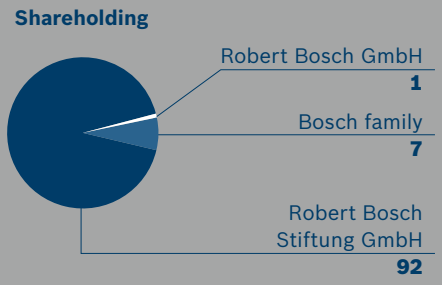
Industrial Technology
Drive and Control Technology [2]
Packaging Technology

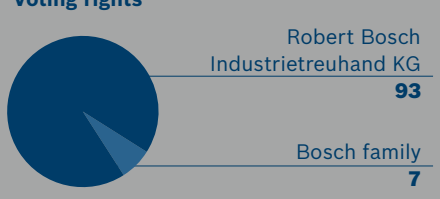
Consumer Goods
Household Appliances [3]
Power Tools

Energy and Building Technology
Thermotechnology
Security Systems

F.02

Shareholders of Robert Bosch GmbH





[1] ZF Lenksysteme GmbH (50% Bosch-owned); company is included in the financial statements at equity
[2] Bosch Rexroth AG (100% Bosch-owned)
[3] BSH Bosch und Siemens Hausgeräte GmbH (50% Bosch-owned); company is included in the financial statements at equity

Fundamental information about the group

The group

The Bosch Group encompasses around 360 subsidiaries and regional companies in approximately 50 countries. Including its trading and service partners, the group is represented in some 150 countries. The parent company is Robert Bosch GmbH, which is headquartered in Stuttgart. It started out as “Workshop for Precision Mechanics and Electrical Engineering,” founded in Stuttgart in 1886 by Robert Bosch (1861-1942). In 1917, the company temporarily changed its legal form into that of a stock corporation (Aktiengesellschaft); in 1937, it reorganized as a limited liability company, Robert Bosch GmbH. Since 1964, the charitable foundation, Robert Bosch Stiftung GmbH, has been the majority shareholder, currently with 92 percent of the shares. An industrial trust, Robert Bosch Industrietreuhand KG, carries out the entrepreneurial ownership functions and exercises corresponding voting rights. Most of the remaining shares and voting rights are held by the founder’s descendants. This ownership structure guarantees the Bosch Group’s business independence, making it possible for the company to plan over the long term and to undertake significant up-front investments in its future.

Businesses

Since the start of 2013, the Bosch Group has been divided into four business sectors that correspond to the reporting segments: Automotive Technology, Industrial Technology, Consumer Goods, and Energy and Building Technology. The former business sector Consumer Goods and Building Technology was split into two new business sectors, Consumer Goods on the one hand and Energy and Building Technology on the other. We expect the new Energy and Building Technology business sector to add further growth by intelligently linking products and services from the increasingly integrated fields of energy and building technology.

Moreover, the Solar Energy division was initially reclassified from Industrial Technology to the Energy and Building Technology business sector. However, we plan to eliminate the Solar Energy division. The crystalline photovoltaics business is reported separately under discontinued operations in the consolidated financial statements. An agreement was signed at the end of November 2013 to sell the cell and module production of Bosch Solar Energy AG at the site in Arnstadt, Germany. The subsidiary aleo solar AG in Oldenburg and Prenzlau, Germany, in which Bosch has a 90.7 percent stake, announced the sale of its module production to an investor group in February 2014. In Bosch’s view, there is no realistic chance that the remainder of the aleo solar AG business can survive on its own. As a result, we have proposed that the upcoming extraordinary general shareholders meeting adopt a resolution liquidating the company. In addition, negotiations are currently underway to sell the site in Vénissieux, France. The reason for exiting crystalline photovoltaics is that the massive and persistent drop in prices has led to heavy losses in this segment. Only Bosch Solar CISTech GmbH, in Brandenburg an der Havel, Germany, will be retained as a development unit for thin-film technology.

Automotive Technology business sector

Bosch is one of the largest automotive suppliers in the world. The Automotive Technology business sector encompasses the following divisions:

Gasoline Systems

The Gasoline Systems division develops and produces innovative technologies for internal-combustion engines using gasoline, natural gas, and ethanol, as well as systems

and components for hybrid and electric vehicles. These include engine management systems, fuel supply systems, fuel injection systems, ignition systems, sensors, connectors, electric drive units, power electronics, battery systems, and transmission technology. The trend here is from component supplier to systems provider – from controlling internal-combustion engines and electric drive units, to combining both drive units in the hybrid and plug-in hybrid, through to the interplay of the electric motor with the braking system and energy recovery. United Automotive Electronic Systems Co. Ltd., in Shanghai, China, which has been fully consolidated since 2013, operates in the Chinese market.

This division also includes the fifty-fifty joint venture Bosch Mahle Turbo Systems GmbH & Co. KG, Stuttgart. It develops and manufactures exhaust gas turbochargers for both gasoline and diesel engines for use in passenger cars, commercial vehicles, and large-scale industrial power units.

Diesel Systems

The Diesel Systems division offers an extensive range of energy-efficient, eco-friendly diesel injection systems for passenger cars and commercial vehicles, regardless of engine size, as well as for other applications. Bosch's diesel segment is a systems supplier of important powertrain components. It focuses on injection systems, primarily the common-rail system. This comprises high-pressure pumps injecting at pressures of up to 2,500 bar, the rail, and various injectors (solenoid and piezo). The division also provides air management systems, such as mass air-flow sensors, EDC electronic diesel control, and exhaust-gas management systems such as Denoxtronic, as well as solutions for diesel hybrid vehicles.

Chassis Systems Control

The Chassis Systems Control division develops and manufactures innovative components, features, and systems aimed at improving driving safety and comfort. These include brake-actuation products such as the master cylinder, hydraulic units, and brake boosters, including braking assistance systems. The ABS, TCS, and ESP® electronic braking control systems constitute an important business activity. The division also supplies sensors such as speed, steering-angle, and yaw-rate sensors, and electronics to protect passengers and pedestrians, including airbag control units and crash sensors. Another area is driver-assistance systems based on ultrasound, radar, and video sensors. This includes products such as radar-based speed control (ACC adaptive cruise control), predictive emergency braking systems, and lane-keeping systems.

Electrical Drives

The broad array of products offered by the Electrical Drives division stretches from a wide variety of electromechanical components to entire systems for bodywork applications, including innovative and energy-efficient actuators and systems and components for engine thermal management, air-conditioning, and windshield cleaning. The product range also includes actuators for electric windows, seat adjustment systems, and sunroofs, fan modules and engine-cooling drive systems, pumps and valves for cooling systems, air-conditioning components, front and rear wiper systems, as well as wiper arms and blades. Electrical Drives also makes motors for electrical steering systems, for ABS and ESP® pumps, as well as for e-bikes and e-scooters, i.e. electrically powered bicycles and scooters.

Starter Motors and Generators

This division develops and manufactures starters and alternators for passenger cars and commercial vehicles. The extensive product catalog includes long-life starters for gasoline and diesel engines, especially for use in fuel-saving – and therefore CO_2-

reducing – start-stop systems. Our alternators provide the vehicle with a reliable energy supply and their high efficiency helps to significantly reduce fuel consumption.

Car Multimedia

The Car Multimedia division offers intelligent solutions to help improve the flexibility and performance of in-car entertainment, navigation, telematics, and driver-assistance systems. Vehicle infotainment architectures are developing into increasingly integrated systems. These include driver information and infotainment systems that can be used worldwide, and that feature natural-language voice control, premium instrument clusters, and head-up displays. The division also offers terminals and communication systems for use in commercial vehicles.

Automotive Electronics

Automotive Electronics develops and manufactures microelectronics. Additional core competencies are systems integration and vehicle calibration. The product portfolio ranges from components such as semiconductors, sensors, and MEMS (microelectromechanical systems), through control units for body electronics, braking control systems, and engine management systems (also contract manufacturing of the above), to non-automotive applications such as sensors for consumer electronics. Automotive Electronics also includes the eBike Systems business unit, which produces drive and control units for bicycles with electric motors.

Automotive Aftermarket

This division manages the sales and worldwide logistics of vehicle spare parts and products for the aftermarket. It also includes in-house production and technical customer support for automotive products and systems. Under the “Bosch Diagnostics” label, it provides testing and repair-shop technology, diagnostics software, service training, and technical information and services. The division is also responsible for the Bosch Car Service and AutoCrew repair-shop franchises, two independent repair-shop chains with more than 15,000 and 500 locations respectively.

Steering Systems

ZF Lenksysteme GmbH, based in Schwäbisch Gmünd, Germany, is a fifty-fifty joint venture between Robert Bosch GmbH and ZF Friedrichshafen AG, Friedrichshafen, Germany. Beginning with the 2013 consolidated financial statements, the company is consolidated in accordance with the equity method. ZF Lenksysteme develops, manufactures, and sells steering technology for passenger cars and commercial vehicles. In addition to complete steering systems, steering columns, and steering pumps for vehicles ranging from small cars to commercial vehicles, the product line also covers components such as valves, universal joints, and steering shafts. Electrical steering systems, which are crucially important in electric and automated vehicles, are of increasing significance.

Other businesses

Bosch’s ETAS Group companies provide innovative solutions for embedded software systems that are used in the automotive and other industries. The Bosch Engineering GmbH subsidiary, headquartered in Abstatt, Germany, offers a broad range of customers tailored solutions based on tried and tested technology used in large-scale series production. For example, it provides solutions for sports cars and off-road vehicles, but also for railcars, marine applications, and industrial engines. Bosch’s motor racing activities are also located there.

Industrial Technology business sector

Since fiscal year 2013, our Industrial Technology business sector has focused on two divisions.

Drive and Control Technology

The Bosch Rexroth AG subsidiary, based in Lohr, Germany, specializes in drive and control technology and is one of the world's leading suppliers in this field. It offers customized drive, control, and actuator solutions for the industrial automation, mobile machinery, and commercial vehicle segments, as well as for renewable energy. Following the sale of its pneumatics business effective January 1, 2014, the division now concentrates on electrical, hydraulic, and mechatronic components and systems. These technologies are used in every branch of industry. The division operates in more than 80 countries as a systems partner, service provider, and supplier. Moreover, it offers a comprehensive range of services and is involved in large-scale international projects such as power plants and lifting systems.

Packaging Technology

This division is one of the world's leading providers of process and packaging solutions for the pharmaceuticals, food, and confectionery industry, as well as selected segments of the beverages industry. Its product catalogue includes individual modules, customer-specific systems, and complete solutions. These solutions are complemented by a comprehensive after-sales service portfolio. This division also includes ATMO, Bosch's in-house supplier of assembly systems and special-purpose machinery. ATMO develops flexible, scalable plans for assembly systems and builds customized solutions in the field of testing and calibration technology. The portfolio ranges from planning to turnkey plants, including ramp-up support, and includes a comprehensive scope of services.

Consumer Goods business sector

Since the beginning of 2013, our consumer goods businesses have been consolidated into one business sector, which includes the following divisions:

Power Tools

With brands such as Bosch, Dremel, and Skil, Bosch is one of the world's leading suppliers of electric power tools and accessories. The Power Tools division has a broad range of products aimed at both the professional and do-it-yourself markets. In addition to power tools such as hammer drills, impact screwdrivers and jigsaws, the product line also includes gardening equipment such as lawnmowers, hedge trimmers and high-pressure cleaners. In the power tools category, one of the areas of focus is convenient, high-performance cordless equipment. The division also offers innovative, digital laser measurement tools for both professional and DIY users. The accessories include a comprehensive range of abrasive systems, drill bits, and saw blades.

Household Appliances

BSH Bosch und Siemens Hausgeräte GmbH, based in Munich, Germany, is a fifty-fifty joint venture between Robert Bosch GmbH and Siemens AG, Munich. This joint venture, too, is now included in the Bosch Group's consolidated financial statements using the equity method. The household appliance manufacturer, which is among Europe's leading suppliers, has a product portfolio that ranges from washing machines and dryers through refrigerators and freezers, dishwashers, and vacuum cleaners to small appliances such as coffee makers, irons, and hot-water appliances. The household appliance specialist sells its products under the main Bosch and Siemens brands, as well as under regional and specialty brands such as Gaggenau, Neff, Constructa, Zelmer, Balay, and Pitsos.

Energy and Building Technology business sector

The Energy and Building Technology business sector covers a broad spectrum of products and services in the fields of heating, air-conditioning, and security. In addition to the Security Systems and Thermotechnology divisions, it also includes the hitherto unconsolidated service-provider subsidiary, Bosch Energy and Building Solutions GmbH, headquartered in Ditzingen, Germany.

Security Systems

The Security Systems division provides products and services in the fields of security and business services. The product portfolio encompasses video-surveillance, intrusion-detection, and fire-detection systems, as well as access-control, public-address and evacuation systems, and professional audio and conference systems. In Germany and the Netherlands, Bosch's Building Security business unit provides one-stop tailor-made security solutions, including services such as planning, financing, operation, and maintenance. In other selected countries, Bosch develops customized security solutions for large-scale projects; these are implemented on site by a systems integrator. The Communication Center business unit provides services in areas such as marketing, sales, customer support, and building management in more than 30 languages.

Thermotechnology

In Europe, our Thermotechnology division is a leading manufacturer of energy-efficient heating products and hot-water solutions. The division's products are sold under international and regional brand names such as Bosch, Buderus, Worcester, and Junkers. The product portfolio ranges from floor-standing and wall-mounted heaters to cogeneration plants and industrial boilers. Despite the decision to exit the crystalline photovoltaics market, renewable energy remains a high priority for the Bosch Group. This applies both to its own products, such as heat pumps and solar heating systems, and to the integration of third-party products, for example photovoltaics.

Objectives and strategy

Objectives

Our objective is to maintain our position as one of the world's leading suppliers of technology and services. Guided by our strategic imperative "Invented for life," we intend to provide beneficial technology whose functionality and design also spark enthusiasm among customers. We feel duty-bound to fulfill the mission handed down to us by Robert Bosch in his will. In this will, he charged his successors with ensuring the company's strong and meaningful development as well as its financial independence.

In business terms, these universal objectives mean that we endeavor to generate long-term average sales growth of 8 percent per year, including acquisitions. The corresponding target EBIT margin is also 8 percent. To achieve these targets, we want to increase our global market position. Our intention is to double our sales in the Americas and Asia by 2020, and to outperform the market as a whole in Europe. By introducing innovative products in mature markets such as Europe and North America, we plan to gain new market share and enter new market segments. Our goal is to significantly increase our presence in the growth markets of Asia, South America, and eastern Europe, and increasingly also in Africa. As far as the business sectors are concerned, over the long term, our long-term objective is to achieve a better balance between Automotive Technology and the other business sectors.

In pursuing these objectives, we will build on our core strengths: our high level of innovativeness, excellent quality, global presence, and distinctive corporate culture. We will also work systematically to improve operating excellence. This does not only apply to profitability. Given the rapidly changing business environment, it increasingly also applies to our company's agility. In this respect, consistent customer focus is a crucial foundation for innovations and new business models. The "Bosch way," which was given concrete shape in 2013, is designed to help us put these objectives into practice. It sets out a number of options for increasing growth and enhancing competitiveness. We want to work together with our associates to unlock the company's great potential, while at the same time improving the way we integrate local expertise and creativity.

Strategy and innovation

Fundamental direction

In our growth strategy, we are guided by significant megatrends. For example, we are continuing to expand our business internationally, especially in Asia. The economic importance of this region will continue to grow, due to the high growth potential in China, India, and also southeast Asia. We intend to focus more strongly on Africa in the future. In all our business sectors, the growing need to conserve resources, protect the environment, and increase energy efficiency is highly important – both in terms of products and services as well as within our own company. Another important trend is increasing urbanization, which means more and more conurbations. This creates additional tasks in terms of mobility, security, and environmental protection. An aging population also creates new challenges for products and services. The increasing connectivity of things and services over the internet is leading to far-reaching changes, making innovative products, services, and business models possible. As a result, we are systematically pushing ahead to make all our business sectors' products and solutions web-enabled. In the future as well, we will be guided by the aim to make every product we offer "Invented for life," helping improve quality of life.

The main focus here is on creating a competitive advantage through innovative products and customer focus. At the same time, megatrends involve a significant level of uncertainty, due to the unpredictability of the pace of change, but also to the increasing complexity brought about by technological change, as well as changes in the competitive landscape as a result of new competitors and business models. Against this backdrop, it is becoming more and more important to develop products that are tailored to customers' needs. At the same time, alliances and agile units will play an increasing role in developing new business fields. On a more general level as well, agility and flexibility are becoming more important for the company as a whole.

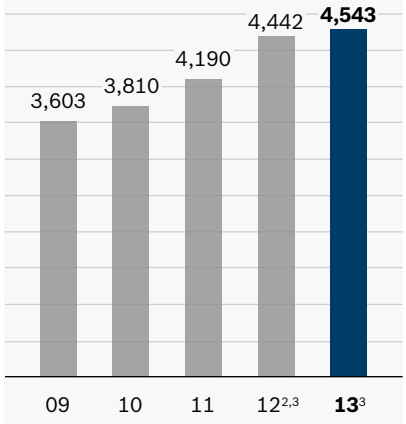
Environmental protection and energy efficiency as drivers of growth

Today, the Bosch Group already spends around half its research and development budget on environmental protection, including energy efficiency and resource conservation. This is because these areas offer great potential in all four business sectors. They are a decisive driver of growth for Automotive Technology, the biggest business sector, in part due to increasingly strict emissions standards worldwide. We believe there is still considerable potential in internal-combustion engines. By 2020, by further developing our injection systems, but also through a series of other measures, such as turbocharging downsized engines, we intend to reduce gasoline- and diesel-powered vehicles' fuel consumption by a further 20 percent from their 2012 levels. At the same time, we provide solutions for the growing demand for natural gas-powered engines.

F.03

Total research and development cost[1]

Bosch Group 2009 - 2013
Figures in millions of euros

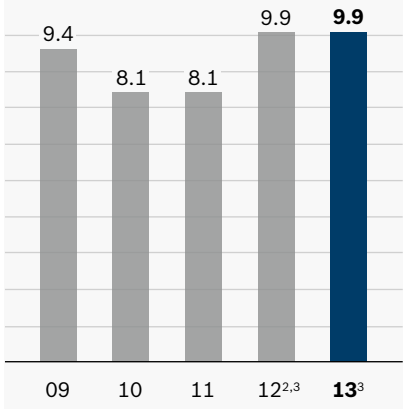


[1] Including development costs charged directly to customers;
[2] Adjusted figures
[3] Continued operations

F.04

Total research and development cost[1]

Bosch Group 2009 - 2013
Figures as a percentage of sales



[1] Including development costs charged directly to customers;
[2] Adjusted figures
[3] Continued operations

Beyond injection systems, we intend to offer a number of new products to reduce consumption and emissions by internal-combustion engines. This includes our BRS boost recuperation system, a 48-volt entry-level hybrid with a highly efficient generator that can support the internal-combustion engine with extra torque. This makes the new system an affordable option for electrifying mid-range vehicles. In addition, it offers a fuel-saving coasting function that shuts off the internal-combustion engine for up to 30 percent of the driving time, allowing the vehicle to coast silently, with zero emissions.

The eClutch electronic clutch makes this coasting function available for cars equipped with manual transmission as well. In this no-fuss solution, the eClutch disengages automatically as soon as coasting is possible. In addition, by using the navigation system as a sensor for conditions outside the vehicle, we are expanding the start-stop system to include a coasting assistant. The navigation system gives an advance preview of speed limits and the topography along the route, thereby making additional fuel savings possible. At the end of 2013, a system that uses GPS data to adjust the battery charge state in hybrid vehicles won recognition from the EU as an “eco innovation.” This technology thus provides a credit that can be used to offset emissions by the respective automaker’s passenger-car fleet. Another innovation is the iBooster, an electronically controlled brake booster that no longer needs any vacuum from the internal-combustion engine. This is important not only when cars powered by internal-combustion engines are coasting, but also for the electric cars of the future. The iBooster also builds up brake pressure three times faster than traditional pumps, thereby shortening the braking distance by several crucial meters.

In mid-2014, moreover, the Euro 6 standard’s much stricter legal restrictions on nitrogen oxide emissions will come into effect in the European Union. This will mainly affect large sedans, 4-wheel-drive leisure vehicles (SUVs), and diesel-powered commercial vehicles. Once again, increasingly innovative technology is needed. We have solutions for every vehicle class and are working on smaller versions as well as affordable systems such as Denoxtronic, which reduces nitrogen oxide emissions by 95 percent. For compact vehicles, progress is being made through improved combustion.

Reducing emissions is also important in the other business sectors. In Industrial Technology, the trend is toward greater automation, an overall increase in the utilization rate of machinery and facilities, and an increase in energy efficiency. One result is the partial electrification of automatic functions. With its 4EE (“For Energy Efficiency”) program, the Drive and Control Technology division provides advice on energy efficiency to its customers under its Bosch Rexroth brand. Here, energy use is optimized not only for individual stages of production, but also for entire manufacturing systems.

The same applies to the company’s own production. In 2013, Bosch Rexroth opened a groundbreaking paint shop in Mellansel, Sweden, that reduces energy consumption by around 75 percent. At the same time, it sets new standards for connectivity: every component has an RFID (radio-frequency identification) chip that has been encoded by the order fulfillment system. This provides precise instructions at each separate stage for customized paintwork. The heavy-duty engines manufactured by Bosch Rexroth in Mellansel are used on ships and for offshore applications, in the extraction of raw materials, for handling heavy cargo, and in recycling plants.

In the pharmaceuticals industry, legal requirements for manufacturers are being tightened worldwide, particularly with regard to hygiene and increasingly complex products. Stricter standards, in turn, require more and more high-tech processes. In the food industry, too, both consumers and lawmakers around the world are making increasing demands on the safety of product packaging. This trend is opening up additional growth opportunities worldwide. We are meeting these trends with easy-to-deploy equipment and high-quality packaging. At the same time, we coordinate the components in such a way that customers can create their own customized solutions. Through acquisitions in this area, we have systematically expanded our portfolio of process and inspection technology in recent years. We are also gradually expanding our service portfolio, for example by offering condition monitoring and maintenance capabilities with our MAVUS system. Thanks to a special headset, technicians can establish online contact with an expert at a central location. This makes it easier for them to carry out maintenance and repair work.

A third major area where we want to help reduce emissions is energy and building technology. In the Thermotechnology division, we are focusing on further developing today's heating technology, especially by combining conventional and renewable energy sources, and on fundamental innovations. For example, we have introduced a power-generating heating system. Based on a ceramic solid-oxide fuel cell, it enables the decentralized production of electric power and heat for single-family homes and duplexes. The system can lower electricity costs by up to 40 percent while reducing CO_2 emissions by up to 50 percent compared to conventional power and heat generation. As a participant in the ene.field project, Bosch Thermotechnology will install around 70 of these power-generating heating devices in Germany, the United Kingdom, the Netherlands, and France beginning in 2014. This will help prepare for the market launch.

Moreover, energy efficiency and environmental protection continue to be very important for consumer goods such as power tools and household appliances. In the Power Tools division, we develop cordless equipment for professional and DIY users, and in particular for gardening equipment as well. 18-volt lithium-ion batteries are a new development here. While battery weight and volume are the same, capacity is higher. They also feature the "Smart Li-ion+" electronic control system, which guarantees that the lithium-ion battery always provides exactly the amount of power needed by the respective application. A current example of Bosch's innovative lithium-ion gardening tools is the Indego robotic lawnmower. As occupational health and safety considerations are increasingly important for power tools, we are now, for example, launching an improved dust-collection system for drilling and chiseling tools.

In Household Appliances, we are also developing efficient solutions that conserve resources. For example, BSH Bosch und Siemens Hausgeräte GmbH has further expanded its range of appliances with the best energy-efficiency rating, A+++. More attention is also being paid to noise emissions – in part because of new architectural designs in which the living areas and the kitchen increasingly tend to merge into a single space. The issue of noise emissions is relevant not only for large appliances such as washing machines and dishwashers, but also for vacuum cleaners. At the same time, customers are also demanding more attractive styling. One of the ways Bosch has responded is through its Color Glass Edition for fridge-freezers.

Mobility is becoming electric, automated, and connected

We only expect a major breakthrough in electric driving in the next decade. According to our projections, electric cars, including plug-in hybrids, will not exceed 10 percent of the market until after 2020. Nonetheless, we are already working today in this field, which we consider important for our future. For large passenger cars in particular, future emissions limits will only be attainable with greater electrification. Bosch invests around 400 million euros annually in the electromobility of the future. Over the course of 2014, we will be working on 30 projects relating to electromobility – from an all-electric system for sub-compact cars to an electrified sports car. With these projects, we have approximately 1,800 associates working on all three areas of the electrical powertrain: battery technology, an electric traction machine, and power electronics.

In terms of cost and range, broad market penetration of electric cars will depend mainly on progress in battery technology. Following the disbandment of the SB LiMotive joint venture in 2012, we have reorganized our battery technology work, shifting it from the Gasoline Systems division to our subsidiary Robert Bosch Battery Systems GmbH, Stuttgart. In 2013, we also announced a partnership with the Japanese companies GS Yuasa and Mitsubishi Corporation to develop the next generation of highly efficient lithium-ion batteries. After receiving approval from the antitrust authorities, the new Stuttgart-based company Lithium Energy and Power GmbH & Co. KG started operating in early 2014.

But these are not the only areas in which we are working on the pioneering field of electromobility. Our e-bikes product portfolio, which ranges from highly efficient drive units (engines and transmissions) through high-quality batteries to easy-to-use, smart on-board and bike computers, quickly made us the leading provider in Europe. In 2013, we also launched a newly developed drive system for electric scooters and mopeds, which we offer mainly in China. The electronic control unit improves energy recovery from braking and has additional security features such as a seat occupancy detection function that switches the engine to lower power when the e-scooter is being pushed manually.

In addition, we are also involved in alliances to develop the necessary infrastructure for electric cars. For example, on behalf of the Berlin-based Hubject GmbH – a consortium of automotive and energy companies – our internet specialist Bosch Software Innovations GmbH, based in Immenstaad, Germany, has developed “e-roaming” software to help locate charge spots run by various providers.

The goal of improving traffic safety is also growing in importance worldwide. As a result, more and more initiatives are aimed at protecting road users. More than 90 percent of road accidents are caused by human error. One factor driving innovation is the vision of accident-free driving, toward which driverless cars (“automated driving”) can make an important contribution. It is our belief that automated driving will develop gradually, becoming more widespread only in the next decade. Before that can happen, major progress needs to be made in several R&D fields. These include highly efficient methods for ensuring reliability, sensors capable of more precise 3D environment recognition, and securing the electronics architecture, e.g., through constant plausibility checks on the data supplied by the sensors. In addition, there are legal issues in many countries that have not yet been resolved. We are already driving several pilot vehicles on public roads in the U.S. and Germany.

The driver-assistance market will grow considerably in the years to come. One reason for this is a new rating scheme for vehicle safety. Starting in 2014, the Euro NCAP test will only provide a vehicle with a five-star rating if it has at least one driver-assistance feature, which means at least one environment sensor. This will create additional growth, especially in the sensor segment. In 2014, we will be starting series production of a video camera that can see objects in stereo. This means that a single sensor is now sufficient for an automatic emergency braking system for pedestrian protection – when children suddenly run out on to the street, for example.

In 2014, we will also launch a traffic jam assistant that keeps the vehicle in its lane in congested traffic. Later, this will serve as a traffic jam pilot that will also be capable of automatically changing lanes. We are also planning to launch an enhanced parking assistant in 2015 that will include a remote control for maneuvering the car into tight spaces such as garages or parking spaces. In the future, a 360-degree video sensor system will enable a car to look for a space in parking garages on its own.

For automated driving, information about the car's surroundings has to be up to date. In many cases, this will only be possible if vehicles continuously share information on their surroundings with one another. This might include information about icy roads or construction zones, for instance. At the same time, though, drivers must not be overloaded with information. Given the increase in information and entertainment systems available for cars, ease of use is becoming more and more important. As an example, we developed a driver information system for General Motors that can be precisely controlled using natural-voice commands.

In addition, we are promoting the spread of head-up displays. Thanks to a new solution, projecting navigation arrows onto the windshield, and thus directly into the driver's line of sight, will be affordable even in mid-range cars. The demand for easy-to-use infotainment systems, including systems that also link to smartphones, is also rising. Developing such innovative solutions is part of our strategy. We have launched a new system called MySpin that integrates smartphone apps from various producers and systems into the driver information system so that they look the same as on the smartphone.

Connectivity not only means accident-free driving and greater convenience; it also opens up opportunities for new services. Here, too, we intend to develop new markets for Bosch. For example, for fleet operators such as leasing companies and insurance companies, we offer new telematics services for remote vehicle diagnosis. In this way, faults can be analyzed and preventive maintenance carried out. Another feature we offer is an electronic logbook. Based on a new connectivity control unit, it enables the vehicle's systems to connect with external IT systems.

Increasing connectivity over the internet as a driver of innovation

The growing importance of connectivity can be seen not just in Automotive Technology, but also in our other business sectors. Each of our electronic products is gradually becoming internet-capable. When it comes to connectivity, we can draw on our broad technological expertise and presence in diverse fields of activity.

Moreover, we are continuing to expand our sensor activities. Even now, Bosch is one of the leading global suppliers of MEMS sensors for the automotive industry. MEMS are tiny components that combine sensors and micromechanical structures on a single chip. For example, our Bosch Sensortec GmbH subsidiary in Reutlingen offers MEMS

sensors for consumer electronics applications such as smartphones. In the future, MEMS sensors will be an important building block for connectivity on the internet of things and services. Containing signal processing and battery in one unit, they will be so small, energy efficient, and inexpensive that they can be used in their billions. At the same time, mobile networks are practically ubiquitous.

At the end of 2013, we set up a subsidiary to develop and sell networked devices for end users, as well as solutions based on those devices. The headquarters of this subsidiary, Bosch Connected Devices and Solutions GmbH, is located at the Electronics Competence Center in Reutlingen, Germany. An initial area of focus is on sensors for the "smart home," for example for use in security systems for doors and windows. The company developed out of one of the "innovation clusters" through which we pool our skills and resources in order to develop new business ideas for the connected world. Other clusters have been set up for connected buildings, connected mobility, and connected energy. We have also expanded our internet expertise in recent years by acquiring specialist internet companies and integrating them into Bosch Software Innovations. This subsidiary currently has around 600 associates.

For smart homes, our Thermotechnology division will gradually offer both gas-fired and oil-fired boilers with an IP interface. In 2013, we also launched the internet-capable Nefit Easy thermostat, initially in the Netherlands; its features include energy monitoring, the use of online weather data, and the ability to detect when nobody is at home. We have also developed apps that make it easy for users to control the heating via a smartphone or a tablet computer and enable installers to adjust settings and to troubleshoot. Predictive condition monitoring is playing an increasingly important role, especially for commercial boiler systems. Moreover, in the Energy and Building Technology business sector, our Bosch Energy and Building Solutions subsidiary offers an internet-based energy platform for commercial buildings and industrial sites that uses information and communication technologies to create opportunities for additional increases in efficiency.

Connected industrial production will play an increasing role for Bosch – both as a user and as a supplier. One of the preconditions for industrial connectivity is open software systems, as these will allow equipment and systems made by different companies to connect to each other and their surroundings. In 2013, our Bosch Rexroth subsidiary received the Hermes Award, one of the most prestigious international technology prizes for the capital goods industry, for its Open Core Engineering software concept. With Open Core Engineering, engineers can for the first time create new software functions in many different programming languages, thereby accessing the control core directly.

At the same time, it is important to further expand customer contact over the internet. Here, too, we are pushing ahead with numerous initiatives. One current example in the Thermotechnology business is an online portal, www.effizienzhaus-online.de, for advice on refurbishing buildings to make them energy efficient. At its core is a multidisciplinary building configuration system with a manufacturer-independent computation module from the Fraunhofer Institute. This allows end customers to pre-plan their renovation project, from the heating system to the roof. Experts such as heating contractors, energy consultants, and architects can then use this planning information to prepare quotes. Meanwhile, the Bosch Toolbox App for power tools is now one of the world's most successful apps for DIY users. One of its new features is "Building Documentation," which

enables do-it-yourselfers to document their current project quickly and completely using their smartphone or tablet computer. BSH Bosch und Siemens Hausgeräte offers the “myBosch” service app. It provides tips on appliance use, user manuals and technical data, helpful videos, and information on accessories for household appliances.

Alliances are increasingly important

Alliances and fields tests are increasingly important for developing these complex future markets. In 2013, along with our partner companies ABB, Cisco, and LG, we announced the creation of a consortium that will develop a software platform for smart homes. A memorandum of understanding has been signed. However, the project is still subject to approval by the antitrust authorities. As part of the agreement, the participating companies intend to develop an open architecture for data exchange. The goal of the software platform is to make it possible for devices and services from different manufacturers to exchange information with each other.

We are working with the Principality of Monaco on a connected city project. Since November 2013, new Bosch technologies have been used there for digital connectivity. The initial focus is on mobility and will later switch to energy-saving solutions. These are the first steps to implementing the cooperation agreement signed by the Principality of Monaco and the Bosch Group in July 2012.

Since January 2012, Bosch has been working alongside other industrial companies and experts in information and communication technology and manufacturing research as part of the Industry 4.0 working group, which is looking at how the internet of things will affect manufacturing and logistics in the future. Moreover, since 2013, Bosch Rexroth and our Thermotechnology division have been working together as industrial and research partners on a project headed up by the University of Darmstadt. The participants in this project, called “Energy-efficient factory for interdisciplinary technology and application research – the eta factory,” believe that energy savings of up to 40 percent are possible in future industrial production.

Alliances to develop new production technologies have also been successful. For example, we have helped develop ultrashort pulse lasers, which are revolutionizing precision machining. Together with the Ditzingen-based machine-tool manufacturer Trumpf and the University of Jena, Bosch received the German President’s Future Prize, one of the most important innovation awards in Germany.

In addition, we are increasingly staking our hopes on cross-divisional collaboration within the company. One of the products successfully developed in this way is eCall, the automatic emergency call system for vehicles. eCall was primarily the result of collaboration by the Security Systems, Chassis Systems Control, and Car Multimedia divisions, as well as Bosch Software Innovations. The emergency call system is activated by the same sensors that deploy airbags. The car’s infotainment system is used to contact the Bosch security operations center. We are also expanding our cross-selling activities, which we believe offer significant potential. For example, the various divisions of our Energy and Building Technology business sector are often involved in large-scale projects from a very early stage. This means they can set up contacts for other divisions. We are currently focusing our activities on seven areas: airports, automobile production, hotels, mining, railways (including railway stations), sports stadiums, and theaters.

Further expanding the company's international presence

Expanding our international presence is another important part of our strategy. To accomplish this, we are reinforcing our global presence, for example through new distribution companies in promising markets in Africa and through new production sites in major growth markets in Asia, eastern Europe, and South America. The first Automotive Technology manufacturing facility in Indonesia is slated to go into production in 2014. Southeast Asia is precisely one of the areas where we want to establish a stronger presence. We already have five manufacturing sites in southeast Asia, located in Thailand, Malaysia, and Vietnam. We are currently expanding significantly in Vietnam, as well as in Russia and Mexico.

It is becoming more and more important to offer products that are tailored to each customer's needs, and to better exploit the innovation potential of our engineering centers around the world. With this in mind, we have pooled our methodological expertise in a corporate "User Experience" department. Its job is to help the divisions take a more customer-centric approach when developing their products and services. Such an approach is in evidence in our new Nefit Easy thermostat and the new Nyon user interface for e-bikes. These requirements apply equally to mature markets –such as Europe, North America, and Japan – and to the emerging markets. One example of a product for mature markets is MSC motorcycle stability control, the technical foundation for which was laid by Bosch engineers at the engineering center for two-wheeler safety in Japan. MSC, an ESP® for motorcycles, reduces the risk of accidents in bends.

In emerging markets such as India and China, prices in the fast-growing mid-price segments continue to be 30 to 60 percent lower than in developed countries. In order to develop this market potential, we are focusing increasingly not just on local manufacturing, but also on local development. We have, for instance, developed a navigation system for the Chinese automotive market. We have also come up with an affordable antilock braking system for two-wheelers, which controls the front wheel only. Offering consumer goods such as power tools and household appliances with mid-range prices is also an integral part of the growth strategy for these markets. Moreover, in 2013 the Thermotechnology division launched a new gas-fired instantaneous water heater, developed and manufactured in China.

Further, we want to involve our local customers more. Working closely with a leading Indian tractor manufacturer, our Drive and Control Technology division developed an electrohydraulic hitch control for tractors. It meets the local market's requirements for efficiency, functionality, and robustness. We are also expanding our engineering capacity in Mexico. We plan to set up a development and software center for the Americas in Guadalajara, comparable to similar centers we have already set up in India and Vietnam. Our site in Campinas, Brazil, demonstrates how successful such local development activities are: ten years ago, it developed flex fuel technology, which makes it possible for vehicles to run on different blends of gasoline and ethanol.

Quality as the basis for sustained success

High quality standards are fundamental to our corporate strategy. They start with a deep understanding of products and processes. Such an understanding leads to good solutions for our customers. In order to continue further developing our methods, we are currently expanding active field observation and analysis, in part by strengthening networks with our customers on such issues. We have set up a problem-solving program to expand our international team of internal consultants and experts. Especially in the Automotive Technology divisions, these people develop an in-depth understanding of technical interrelationships, and in this way find lasting solutions to problems. Our performance indicators and a series of awards also attest to the quality of our products.

For example, thanks to its especially high quality standards, Automotive Technology once again received a number of awards for quality from our customers in Europe, the Americas, and Asia.

Growing importance of agility

The future world will be complex, dynamic, and volatile. Consequently, assessing the potential of new businesses is increasingly important. Robert Bosch Start-up GmbH, which was set up at the beginning of 2014 in Stuttgart, will play a key role in this area in the future. Its mission is to help quickly launch products and services and to make office space and business management expertise available to such growth areas.

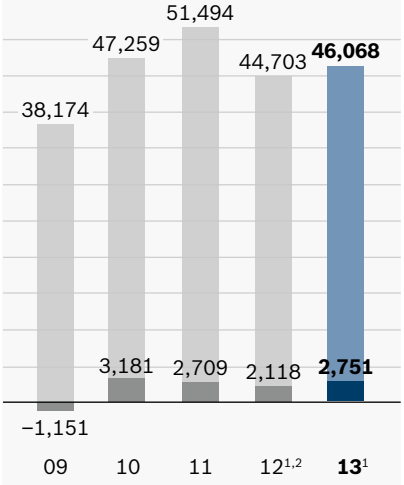
Closer internal networking among our associates across the globe will also help us to increase our agility and make better use of our worldwide pool of knowledge. The "Bosch Connect" social business platform, an important tool that was rolled out in the late summer of 2013, is now available group-wide to approximately 220,000 associates around the world. Our aim is to help the company to continue developing into a dual organization: on the one hand, an efficient line organization supported by highly efficient standards and a shared-service organization, for example in the human resources, finance, or IT segments, and on the other hand, agile teams.

A flexible work culture is also intended to lead to greater agility. With this in mind, the MORE project was introduced in 2011. "MORE" stands for "mindset organization executives." It now offers 650 executives worldwide the opportunity to test one of the more than 100 models for flexible working hours currently available. This enables them to gain first-hand experience that will help them in their search for suitable work schedules for their associates. Our "inspiring working conditions" project is another way we test new possibilities for organizing work, working hours, tools, and the working environment. The goal is to promote creativity and satisfaction among our associates. At the same time, we promote diversity worldwide, as we believe that mixed teams will give our innovative strength and agility an additional boost.

F.05

Sales and EBIT

Bosch Group, 2009 - 2013
Figures in millions of euros



[1] Continuing operations
[2] Adjusted figures

Report on economic position

Generally positive trend

Overall, the Bosch group's performance was positive, despite the weak economic environment. Both sales revenue and earnings increased, and were thus fundamentally in line with our expectations. That said, the amount of sales revenue disclosed was considerably encumbered by currency effects. We were able to improve operating income, both including and excluding the crystalline photovoltaics business. However, performance was very mixed – both regionally and from one business sector to another.

Controlling system

The Bosch value concept as the basis for control

Both creating and securing value are essential for the Bosch Group to be able to continue achieving its core economic targets of profitable growth and financial independence in the future. The Bosch value concept combines value creation with value preservation in order to achieve the group's business targets even in a complex, dynamic, and volatile environment. Particularly for an unlisted company such as the Bosch Group, being able to expand and maintain profitability over the long term is crucial for financing future growth. We secure value by closely tracking cost trends and through liquidity management that includes centralized financial planning.

The main control parameters are sales growth, earnings before interest and taxes (EBIT), and the internal "operating value contribution" indicator. The operating value contribution is calculated in the same way as EBIT, but also deducts the cost of capital. Internal reporting is in principle also based on International Financial Reporting Standards (IFRS). However, in certain respects, such as recognition of impairment losses, pension provisions, and provisions for losses arising from delivery commitments, internal reporting deviates from external accounting. The earnings fluctuations associated with these factors are adjusted for operational control and the executive incentive program. Beginning in fiscal year 2013, our value-based management switched from the after-tax figure used previously to the (pre-tax) operating value contribution, since tax issues cannot be influenced by the operating units. In addition, the calculation of the value contribution has been simplified.

Value contribution targets are used to calculate the result-based portion of executives' variable remuneration, from section-manager level to the board of management. They are also used for calculating associates' performance-related bonuses. The value contribution is also the basis for portfolio management. The central internal reporting tool is a monthly business report, which contains an up-to-date overview of the operating units' performance indicators. It provides both a variance analysis of target versus actual figures and a year-on-year comparison. The report is based on the business plan, which draws on comprehensive market forecasts and is embedded into longer-term strategic corporate planning.

Macroeconomic and sector-specific environment

Only moderate economic growth in 2013

As measured by global gross domestic product, economic growth was 2.5 percent in 2013, owing above all to the subdued first half of the year, and thus lagged behind our expectations of 2.7 percent. This was the weakest growth rate since 2009. The reasons for this initially sluggish performance included the effects of the sovereign debt crisis in Europe and the strained public finances in the United States. Above all, there were growing structural problems in a number of emerging markets. These also led to currency devaluations, which in some cases were massive. As the year progressed, the stabilization of the financial markets in North America, Europe, and Japan had a positive effect on economic performance.

Despite the difficult situation in Europe, overall economic output in the developed countries increased by 1.3 percent, in line with our expectations. In the European Union, 2013 economic performance was flat, contrary to our expectations of a slight increase. The weaker performance was attributable to the continuing recession in southern Europe. In the U.S., growth for 2013 stood at 1.9 percent – in line with our expectations. By contrast, the decline was sharper than expected in Japan.

At 4.6 percent, growth in the emerging markets fell short of our 5.2 percent forecast. Although they continue to be the biggest drivers of growth worldwide, the pace of growth has gradually slowed in recent years. The slowdown in 2013 mainly affected Asia and major economies in eastern Europe. On the other hand, South American countries saw higher economic growth.

On average, commodity prices developed more weakly than we had originally expected. Prices for oil and other fuels were robust, as expected. Conversely, industrial and precious metal prices were in some cases substantially lower than the previous year. In our view, this was because of slower growth in emerging markets and dynamic supply-side developments. The euro was considerably stronger than forecast. We had expected the euro to be weaker due to slower economic growth in the euro zone. Over the course of the year, however, it strengthened against a number of currencies that are important for us.

In our core markets, the total number of passenger cars and commercial vehicles produced worldwide in 2013 – some 87.6 million units – was approximately 4 percent higher than the previous year, and therefore above our projected growth rate of 3 percent. The heavy-truck production included in this figure grew only slightly, by 2 percent to 3.1 million units. As expected, therefore, the prior-year slump in sales was only slightly made up for. However, there were substantial regional differences in the heavy-truck figures, with strong growth in China and South America, stagnation in North America and Europe, and significant declines in India and Russia.

Production figures for passenger cars and commercial vehicles in the European Union remained unchanged from the previous year – and were thus somewhat better than expected. This was partly because vehicle production increased slightly in Germany. Although vehicle production in North America was up 4 percent –and thus stronger than expected – it still lagged behind the double-digit growth posted the previous year. In South America, production figures improved markedly, following the prior-year slump. While vehicle production in China was significantly higher than expected, growing by 15 percent, production in India declined by 6 percent, contrary to our expectations. We had anticipated 7 percent growth for China and 10 percent growth for India.

The generally weak economic trend also affected global capital expenditure. This resulted in another weak year for the mechanical engineering sector, where production rose only 1.2 percent, even less than the previous year. This trend not only affected developed countries, but also major emerging markets such as China. In our important European core market, production in the mechanical engineering sector actually shrank. Order intake only began to rise in the second half of the year; this will only have an effect on production in the mechanical engineering sector after a certain delay.

As expected, growth in global private consumption was somewhat slower in 2013 than in 2012; in the southern European countries that have been particularly hard hit by the debt crisis, consumption declined further, albeit not as sharply as in the previous year. At the same time, the situation showed a slight improvement as the year progressed. Global construction activity, as measured by construction expenditure, was somewhat weaker than we had expected, and also somewhat slower than in 2012. Especially in the euro zone, capital expenditure again dropped significantly, although the decline was not as steep as in 2012. In the Americas and Asia, as well, construction activity did not grow as strongly as in 2012.

Course of business and sales trend

Substantial exchange-rate effects influence sales figures

Despite the weak economic environment, and relative to the 2012 basis for comparison, the Bosch Group's sales rose 3.1 percent to 46.1 billion euros (excluding crystalline photovoltaics). After adjusting for exchange-rate effects, sales exceeded the comparable prior-year figure by 6.3 percent. Exchange-rate losses caused by the strong appreciation of the euro against a number of currencies totaled approximately 1.5 billion euros.

The target range of 2 to 4 percent we had forecast the previous year reflected the heavy burdens of exchange-rate effects to a limited extent only. Moreover, that forecast had used a 2012 basis of comparison of 45.6 billion euros. That figure still included crystalline photovoltaics as well as a 51 percent pro-rata share of the sales of United Automotive Electronic Systems. Using the basis of comparison applied in the original forecast, sales increased by 1.7 percent in nominal terms, and somewhat more than 4 percent after adjusting for exchange-rate effects..

The effects of eliminating use of the proportionate consolidation method total approximately 7 billion euros for 2012. Apart from the major joint venture companies BSH Bosch und Siemens Hausgeräte GmbH and ZF Lenksysteme GmbH, this also includes the 50 percent investments in Kefico Corp., in Gunpo, Korea, and Purolator Filters North America LLC, in Fayetteville, North Carolina (U.S.) which we sold to our former joint-venture partners in 2012 and 2013.

It should also be noted that the shareholding in the Chinese company United Automotive Electronic Systems, which was originally consolidated at 51 percent, is no longer included in the new comparable sales figures for 2012. However, it is consolidated in the 2013 figures at 100 percent, i.e. at 1.3 billion euros. The crystalline photovoltaics business, which is now disclosed separately, accounted for sales of around 480 million euros in 2012 and around 310 million euros in 2013.

Additional consolidation effects of around 610 million euros in 2013 resulted from the first-time full consolidation of the Service Solutions division acquired from SPX Corporation in Charlotte, North Carolina (U.S.) at the end of 2012. This acquisition strengthened our spare parts and diagnostics business in the Automotive Technology business sector. Compared to 2012, 2013 sales once again included delayed negative effects from the sale of the foundation brakes business. The Drive and Control Technology division's pneumatics segment was sold at the beginning of the year but is still fully consolidated in the 2013 consolidated financial statements. No substantial acquisitions that could affect the reported sales figure were completed in 2013.

Strong regional differences in performance

Although the tough economic situation persisted, we managed to increase sales in Europe slightly in nominal terms, by 2.2 percent to 25.5 billion euros, and by 2.9 percent after adjusting for currency effects. Our Asia Pacific operations posted the strongest growth, at 5.8 percent in nominal terms to 11.1 billion euros (13.8 percent after adjusting for currency effects). The severe exchange-rate effects were caused primarily by the depreciation of the Japanese yen and the Indian rupee. In China especially, business picked up considerably throughout the year, mainly in Automotive Technology, but also in Industrial Technology during the second half of the year. By contrast, because of the deterioration in economic conditions, our business in India was only sluggish. Our operations in southeast Asia reported strong growth, especially in Automotive Technology. In Japan, by contrast, business in almost all areas lagged behind expectations – even after taking the strong currency effects into account.

Business performance in South America recovered, following the significant decreases of the previous year. This is particularly evident after adjusting for exchange-rate effects. While sales in this region declined 3.6 percent in nominal terms to 1.7 billion euros, they increased 8.9 percent after adjusting for exchange-rate effects. In this case, the substantial exchange-rate effects were the result of the depreciation of the Brazilian real. In North America, following strong growth the previous year, we were able to increase sales in nominal terms by 3.5 percent to 7.8 billion euros. The diagnostics business acquired from SPX Corporation in 2012 was included in full consolidation for the first time. After adjusting for exchange-rate effects, sales increased by 6.8 percent.

Significant differences by business sector

While the Automotive Technology business sector performed well, Industrial Technology was severely hampered by the tough environment in the mechanical engineering segment. The Consumer Goods and Energy and Building Technology business sectors reported moderate growth.

Our Automotive Technology sector grew by 6.7 percent in nominal terms to 30.6 billion euros, and by 10.3 percent after adjusting for currency effects. Consolidation effects of approximately 1.8 billion euros played a role here. In this context, the inclusion of SPX Corporation's Service Solutions division and of United Automotive Electronic Systems had the greatest effect. The fifty-fifty joint venture ZF Lenksysteme, which also reported increased sales in 2013, is – like the other joint ventures – no longer included in consolidated sales.

In Automotive Technology, demand for modern gasoline injection systems, transmission control units, and continuously variable transmissions for gasoline engines was particularly strong. We also enjoyed strong growth in China, where we continue to benefit from the good market position of our subsidiary United Automotive Electronic Systems. Following a weak start to the year, demand for diesel technology picked up again in the second half, especially in Europe, China, and South America. In Europe in particular, we benefited from the ramp-up of new diesel systems that meet the Euro 6 standard. Demand for exhaust-gas treatment systems was also high. In the commercial vehicles segment, the effects of the weak economy continued to be felt even into the second half of the year, hitting our businesses in India particularly hard.

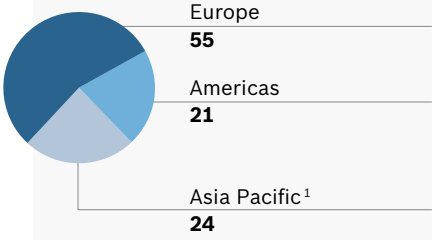
Sensors, including sensors for consumer electronics, also turned in a very positive performance. We also enjoyed great success in drive systems and control units for bicycles with an additional electric drive (e-bikes). We also posted strong growth in the infotainment systems category, thanks to innovations in head-up displays and instrument clusters. We enjoyed similar success with driver assistance systems. In braking control systems, business was flat against the prior year. In the Starters Motors and Generators division we were successful with new generations of products; moreover, the commercial vehicles business developed positively. In the Electrical Drives division, we are working to improve our competitive position, in part by introducing a number of new heating and air-conditioning products, as well as by developing cost-effective sites. In the spare parts business, the original equipment business with car manufacturers performed better than sales in the independent aftermarket. The Service Solutions vehicle diagnostics division acquired from SPX Corporation in 2012 is being integrated.

By contrast, our Industrial Technology sector suffered a substantial drop in sales, which improved only toward the end of the year. Sales dropped nominally by 9.2 percent to 6.8 billion euros (6.5 percent after adjustment for exchange-rate effects). Consolidation effects were insignificant here. The drop in sales affected the Drive and Control Technology division, which felt the full effect of economic weakness in the relevant markets

F.06

Sales by region

Bosch Group 2013
(continued operations)
Percentage figures

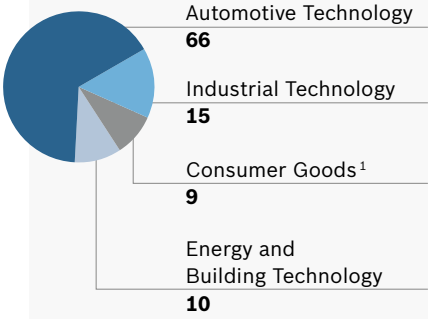


Total: 46.1 billion euros
[1] Including other countries

F.07

Sales by business sector

Bosch Group 2013
(continued operations)
Percentage figures

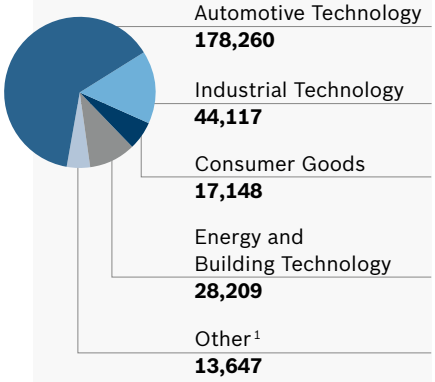


Total: 46.1 billion euros
[1] Including other activities

F.08

Associates by business sector

Bosch Group 2013
(including discontinued operations)
As per: Dec. 31, 2013

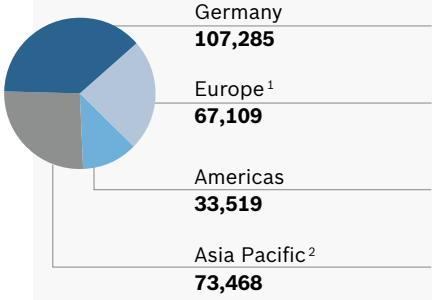


Total: 281,381
[1] Corporate functions and research

F.09

Associates by region

Bosch Group 2013
(including discontinued operations)
As per: Dec. 31, 2013



Total: 281,381
[1] Excluding Germany
[2] Including other countries

and regions. This applied especially to the mining and wind power segments, as well as the Chinese market for construction machinery. On the other hand, thanks to the low level of economic volatility in pharmaceuticals and food, the packaging machinery business performed well. Here, the drivers of growth continue to be the markets in developing countries and emerging markets.

In the Consumer Goods business sector (including other activities), sales decreased slightly by 0.6 percent in nominal terms to 4.1 billion euros, but increased by 2.9 percent after adjusting for exchange-rate effects. This sector continues to be affected by the weak construction activity in many regions, especially in southern Europe. The sales figure disclosed refers to the Power Tools division only, as BSH Bosch und Siemens Hausgeräte, our fifty-fifty joint venture for household appliances, is no longer included in consolidated sales. Power Tools again reported very positive results with a number of innovations, which not only included an expanded range of high-efficiency cordless appliances, but also new laser measurement tools and the Indego robotic lawnmower.

The Energy and Building Technology business sector's Thermotechnology and Security Systems divisions achieved an increase in sales of 3.9 percent in nominal terms, to 4.6 billion euros, and a 5.9 percent increase when adjusted for exchange-rate effects. The Thermotechnology division scored successes in important markets such as Germany and the U.K. with gas condensing boilers. In southern Europe, the market continued to be weak. In Spain and Portugal, however, the downward trend appears to have bottomed out. The Russian market performed well. The Security Systems division further expanded its international business, even though the economic downturn affected its product business in some important markets. Moreover, the shift in demand from analog video systems to IP-based camera systems had a dampening effect. The division is expanding its product portfolio in this area. We achieved strong sales increases in the service business.

Rise in number of associates worldwide

The discontinuation of use of the proportionate consolidation method significantly affects the number of associates reported. In addition, the workforces of the fifty-fifty joint ventures are no longer included on a pro-rata basis. All associates of the Chinese subsidiary United Automotive Electronic Systems are now included. The associates of the Service Solutions division acquired from SPX were already included in the prior-year figures. The approximately 2,100 associates of the now divested pneumatics segment of the Drive and Control Technology division, as well as the workforce of the discontinued crystalline photovoltaics operations, are still included.

The number of Bosch Group associates worldwide group rose by 8,500 to 281,000. Discounting the above-mentioned effects, the workforce grew by around 1,000. The biggest change in associate numbers took place in Asia Pacific (Africa is also included in this figure). The number of associates there rose by 7,800 to 73,000. Again, this was attributable mainly to the full consolidation of United Automotive Electronic Systems. In Europe, the number of associates was unchanged from the previous year at 174,000, while in Germany the number dropped by 1,200 to 107,000. The number of associates increased by a total of around 1,000 to 34,000 in North and South America. All the additions were in Mexico.

Training and continuing professional development are very important at our company. Worldwide, around 6,100 young people were in apprenticeship schemes at Bosch in 2013. Germany, which has a long tradition of dual education in companies and schools, leads the field here with 4,300 apprentices. In 2013, we celebrated 100 years of apprentice training at Bosch. In addition, we will create around 100 additional apprenticeship

positions for young people from southern Europe. In 2014, 50 of these young people will start their apprenticeships in their countries of origin (Spain, Portugal, and Italy) and 50 in Germany.

In 2013, we spent around 185 million euros on associate training, providing a total of 39,000 classroom-based events for 460,000 participants. On average, our associates attended 1.6 classroom-based events. In addition, 240,000 web-based training modules were completed. The Robert Bosch Kolleg offers continuing professional development at college level for specialists and executives. The “Bosch Human Resources System 3.0” project underlines the importance of intensive human resources activities. The focal point of this long-term project is the introduction of a new worldwide human resources organization and an integrated information system.

We made progress on our goal of further increasing the number of international executives and of women in leadership positions. In the overwhelming majority of our focus countries, the percentage of local executives now stands at over 80 percent. We managed to raise the share of women in leadership positions from 11.5 percent in 2012 to 12.2 percent in 2013. That brings us a step closer to our target level of 20 percent by 2020.

Great importance of environmental protection and occupational health and safety

Our target for 2020 is to cut relative, production-related CO_2 emissions from our locations by 20 percent from their 2007 level. In 2013, CO_2 emissions were slightly higher, at 2.5 million metric tons, than in the previous year (2.4 million metric tons). Our total energy consumption came to 6,218 gigawatt hours (previous year: 6,260 gigawatt hours). In 2013, CO_2 emissions relative to value added were 16 percent lower than in 2007.

We also attach immense importance to making continuous improvements in occupational health and safety. The total number of job-related accidents stood at 1,787 in 2013, compared with 2,012 in 2012. The relative number of job-related accidents per million hours worked decreased to 3.6 (previous year: 4.2). This figure was well below the current target figure of 4.1. We intend to make further progress in the coming years, and have therefore launched a worldwide occupational health and safety campaign.

Results of operations

Operating income higher than in previous year

We were able to increase operating income from the prior-year level. Excluding the effects of the disposal of the crystalline photovoltaics business, earnings before interest and taxes (EBIT) improved to 2.8 billion euros, with an EBIT margin of 6 percent. This compared with 2.1 billion euros and a 4.7 percent margin for 2012. On this basis, we managed to increase earnings more than expected. This is an important step on the way toward our target EBIT margin of 8 percent, which we intend to achieve over the medium term.

The improved result reflected both the positive performance of the Automotive Technology business sector and cost-cutting measures in many divisions. These more than offset the negative impact of the poor performance of Industrial Technology, whose decline in sales was caused by a slump in business activity. The pro-rata revaluation of assets due to the first-time full consolidation of the Chinese subsidiary United Automotive Electronic Systems resulted in the recognition of non-recurring positive effects to operating profit of approximately 370 million euros.

Significant income statement items Figures in millions of euros	**2013**	**2012**[1]
Sales revenue	46,068	44,703
Cost of sales	–30,460	–30,084
Gross profit	**15,608**	**14,619**
Distribution and administrative cost	–8,562	–8,355
Research and development cost	–4,543	–4,442
Other operating income and expenses	86	–103
Result from companies included at equity	162	399
EBIT	**2,751**	**2,118**
Financial income	76	1,523
Profit before tax	**2,827**	**3,641**
Income tax expense	–540	–487
Profit after tax		
from continuing business operations	2,287	3,154
from discontinued business operations	–1,036	–850

[1] Adjusted figures

The first-time consolidation of United Automotive Electronic Systems and the full consolidation of the Service Solutions division of SPX Corporation also play a major role in the changes in cost of sales and in distribution and administrative cost. Development costs were 4.5 billion euros, around 100 million above the previous year. The Automotive Technology business sector accounted for around 80 percent of development costs, while Industrial Technology accounted for around 10 percent, and Consumer Goods (including other activities) and Energy and Building Technology for roughly 5 percent each. In other operating income and expenses, the pro-rata revaluation of the assets of United Automotive Electronic Systems had a positive effect, while the set-up of provisions had a negative effect.

Including the separately disclosed results from the crystalline photovoltaics business, EBIT totaled 1.5 billion euros, which corresponds to a margin of 3.2 percent. We therefore exceeded the comparable prior-year return of 2.5 percent in this case as well. However, using this basis, we were unable to achieve our forecast of significantly improved earnings. Including the extensive provisions relating to the planned sale, the EBIT losses in the crystalline photovoltaics segment totaled approximately 1.3 billion euros in 2013.

Profit before tax totaled 2.8 billion euros and corresponded to a return of 6.1 percent. Excluding the crystalline photovoltaics business, we thus reported an after-tax profit of 2.3 billion euros; including the crystalline photovoltaics business, profit after tax totaled 1.3 billion euros. In 2012, both pre-tax and after-tax profit were impacted by substantial special effects. During fiscal year 2012, we thus booked a gain of around 1.1 billion euros on the disposal of our financial investment in Denso Corporation, Japan.

Our important internal control parameter, the operating value contribution, is calculated only for the consolidated group used in internal reporting, under which the subsidiary

United Automotive Electronic Systems and the Service Solutions division of SPX Corporation acquired at the end of 2012 were included in the figures for the full year 2012. As in the previous year, the operating value contribution is negative, at roughly minus 220 million euros. This correlates with our having fallen considerably short of our target margin of 8 percent in 2013.

The starting point for calculating the operating value contribution from EBIT is the internally reported EBIT. At 2.8 billion euros, it deviates only marginally from the externally disclosed figure for 2013. The biggest and most crucial difference between EBIT and the operating value contribution is in the 2.5 billion-euro cost of capital deducted in the operating value contribution calculation. Further differences in depreciation and amortization and other items total roughly 490 million euros.

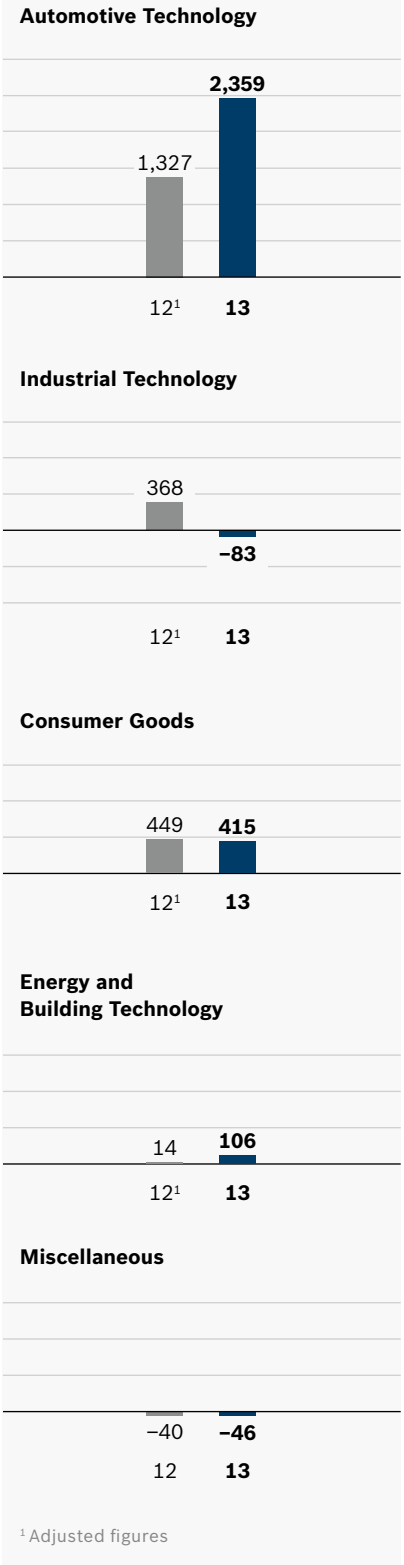
Our Automotive Technology business sector generated EBIT of 2.4 billion euros and a margin of 7.7 percent. Earnings benefited primarily from the continued increase in demand for eco-friendly powertrain technology and from innovations in driver assistance systems and in the infotainment segment. We also scored successes on the cost side. The extraordinary gain from the full consolidation of United Automotive Electronic Systems also had an impact here. The Industrial Technology business sector reported negative EBIT of around 80 million euros, due to the slump in sales in the Drive and Control Technology division – including an impairment loss recognized in the renewable energy segment. In the previous year, Industrial Technology – with its current structure (excluding Solar Energy) – reported a profit of around 370 million euros.

The Consumer Goods business sector posted EBIT of 415 million euros, which was thus slightly below the level of the previous year. The double-digit return on sales of 10.4 percent was attributable to the inclusion of the pro-rata after-tax income of the joint venture BSH Bosch und Siemens Hausgeräte, whose pro-rata sales we no longer consolidate. Even without this effect, though, this division reported an encouraging return. In the Energy and Building Technology business sector (excluding activities in crystalline photovoltaics), we were able to increase earnings to 106 million euros, representing a return on sales of 2.3 percent, compared with 14 million euros or 0.3 percent the previous year. This was achieved despite the tough economic situation, especially in important markets in southern Europe. Nonetheless, this return is not satisfactory.

F.10

EBIT by business sector

Bosch Group 2012/2013
(continued operations)
Figures in millions of euros



[1] Adjusted figures

Net assets and financial position

Very solid statement of financial position

As before, the statement of financial position remains solid. Our 2013 equity ratio was roughly 50 percent, compared with 51 percent using comparable figures for the previous year. On the balance-sheet date, total assets stood at 55.7 billion euros; the adjusted figure for 2012 was 52.6 billion euros. As the proportionate consolidation method is no longer used, the total assets figure for 2012 is around 3.7 billion euros below the figure published a year ago.

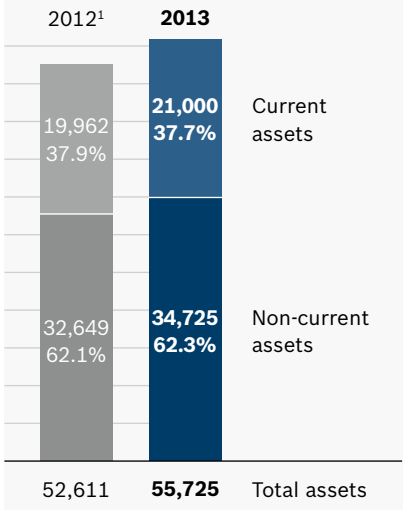
The increase in assets in 2013 was primarily due to the increase in the liquidity position reported on the statement of financial position, which rose to 13.2 billion euros in 2013, from 11.6 billion euros on the balance-sheet date in 2012. Apart from cash and cash equivalents, liquidity as per the statement of financial position includes marketable securities and bank balances with a term of more than 90 days. Intangible assets also increased disproportionately, primarily because of the first-time full consolidation of United Automotive Electronic Systems.

On the equity and liabilities side, equity rose by 0.8 billion euros to 27.7 billion euros.

F.11

Structure of the statement of financial position – assets

Bosch Group 2012/2013
Figures in millions of euros and as a percentage of total assets

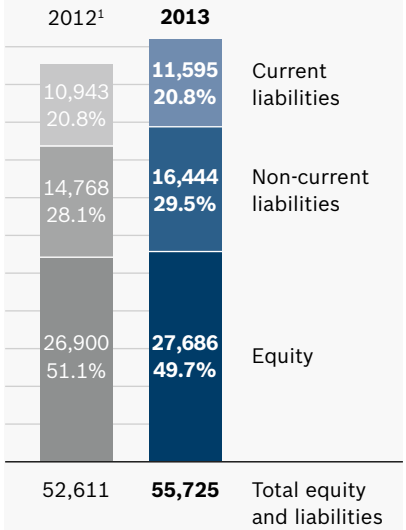


[1] Adjusted figures

F.12

Structure of the statement of financial position – equity and liabilities

Bosch Group 2012/2013
Figures in millions of euros and as a percentage of total net equity and liabilities



[1] Adjusted figures

The biggest changes under liabilities were the other provisions, which were 1.2 billion euros higher than the comparable figure for 2012. The main reasons for this were the provisions set up in connection with the disposal of our activities in crystalline photovoltaics. In addition, provisions have been set up in connection with allegations of unfair competitive practices that Bosch also faces.

Other significant changes on the equities and liabilities side involved financial liabilities, which rose by approximately 470 million euros. We took advantage of favorable interest rates to refinance, as scheduled, a 700-million euro bond and a roughly 500-million U.S. dollar bank loan by issuing new bonds with maturities of between eight and 20 years for a total volume of 1.5 billion euros.

These transactions increased the proportion of financial liabilities raised in the capital markets while lowering the level of bank borrowings. Taken together, the bond interest rates are between 1.543 percent and 5.125 percent. The maturity of the financial liabilities also increased because of the long terms of the new loans. Nonetheless, the more favorable interest rates meant that the average interest rate of the financial liabilities was reduced. Now that the U.S. dollar loan has been repaid, most of the remaining financial liabilities are denominated in euros.

Investments in expanding our international presence

Bosch Group capital expenditure came to some 2.5 billion euros in 2013. This was around 180 million euros less than the adjusted figure for 2012. As per the balance-sheet date, existing investment commitments due to orders already placed totaled some 340 million euros. Thanks to our very good liquidity position, we have plenty of financial resources at our disposal.

We invested around 1.6 billion euros in our European locations, compared with 1.8 billion euros in the previous year. In Samara, Russia, our Automotive Technology sector is currently building a plant that will create around 500 jobs by 2017. Among other things, it will produce antilock braking systems, wiper systems, and alternators; later it will also manufacture starters and common-rail injectors for commercial vehicles. In addition, the Thermotechnology division is building a new plant in Engels, Russia, to manufacture industrial boilers and wall-mounted conventional boilers. In Cluj, Romania, we are building a new facility for electronic control units. Moreover, in 2013 we opened a new facility at our existing location in Blaj, Romania, that will manufacture speed sensors for safety systems such as ABS and ESP®. In Pecinci (near Belgrade), Serbia, we built a new manufacturing plant for wiper systems, and in Mikulov, Czech Republic, we invested in the expansion of the Bosch Power Tools service center.

Capital expenditure in Germany was roughly 910 million euros, compared with 990 million euros the previous year. One focus of investment was the new research center in Renningen, close to our corporate headquarters. This multi-year investment project will cost around 300 million euros in total. In addition, we are further expanding our sensor manufacturing capacity at the Reutlingen facility. Another large-scale, multi-year project is the expansion of the main distribution center for vehicle spare parts in Karlsruhe. In the Packaging Technology division, we are expanding the pharmaceutical plant engineering operations at the Crailsheim site.

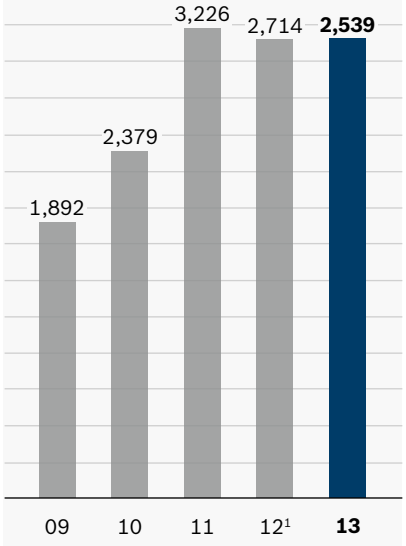
In Asia Pacific (including Africa), we invested around 620 million euros – the same level as in 2012. For example, we opened a new Automotive Aftermarket location in Nanjing, China, where we will produce spark plugs, brake pads, and test equipment for the aftermarket. In North and South America, we invested around 280 million euros, compared to around 320 million euros in 2012. Our main focus was on Mexico, where we expanded our Automotive Technology business sector's Toluca and Juarez facilities. In addition, we began manufacturing ESP® systems at our plant in Campinas, Brazil, in 2013 – the first company in South America to do so.

Broken down by business sector, we invested 2.2 billion euros in Automotive Technology, compared to 2.0 billion euros in 2012. This capital expenditure related to series production roll-outs and increases in production capacity worldwide, for example for gasoline direct injection systems and push belts – the latter involving a multi-year investment in a manufacturing facility in Vietnam. One of the biggest investments was the expansion of common-rail production at our plant in Bursa, Turkey. In Industrial Technology, in part due to the difficult economic environment, we reduced capital expenditure to 165 million euros, compared to 350 million euros in 2012, but nonetheless continued to expand our international presence. Bosch Rexroth opened its new Korean headquarters in Busan. Following capital expenditure of 130 million euros in the previous year, we invested approximately 120 million euros in the Consumer Goods business sector and 80 million euros in Energy and Building Technology, following capital expenditure of around 200 million euros in 2012, for product roll-outs and expansions. Here as well, the effect of the exit from crystalline photovoltaics can be felt.

F.13

Capital expenditure

Bosch Group 2009 - 2013
(including discontinued operations)
Figures in millions of euros



[1] Adjusted figures

Liquidity

Strong financial position and healthy liquidity situation

The Bosch Group has a strong financial position, including 2013 cash flow of 4.0 billion euros or 8.6 percent of sales. The comparable figures for the previous year were 4.1 billion euros or 9.1 percent of sales. The decrease from the previous year was attributable to the financial result and various differences affecting cash flow.

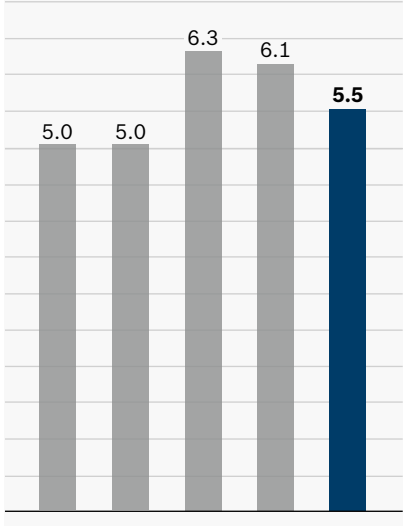
Liquidity at year-end as per the consolidated statement of cash flows (cash and cash equivalents) stood at 3.8 billion euros, compared to 3.1 billion euros the previous year. In addition, the available financing under our euro medium-term note and commercial paper programs totaled 5.25 billion euros and 2.0 billion U.S. dollars. Cash inflows from operating activities rose year on year due to an increase in liabilities and provisions. The cash outflow from investment activities was lower than in the previous year, due to higher expenditures on securities held as investments and the absence of the special effect recognized the previous year for the disposal of the Denso shares. On the other hand, lower equity investments and capital expenditure had an offsetting effect. The cash inflow from financing activities was slightly higher than in the previous year.

The Bosch Group has a central financial and currency management system. This is designed to control payment flows to optimum effect and to limit the risks of currency exposures at the Bosch Group level. Our investment strategy is therefore aimed at broad diversification of shares and interest-bearing securities. Standard & Poor's reaffirmed Robert Bosch GmbH's long-term rating of AA- (with a "stable" outlook).

F.14

Capital expenditure

Bosch Group 2009 - 2013
(including discontinued operations)
Figures as a percentage of sales



[1] Adjusted figures

Consolidated statement of cash flows Figures in millions of euros	2013	2012[1]
Cash flow	**3,956**	4,053
percentage of sales revenue	**8.6**	9.1
Liquidity at the beginning of the year	3,120	2,892
Cash flow from operating activities	+4,276	+3,193
Cash used in investment activities	–3,872	–3,233
Cash flow from financing activities	+302	+266
Miscellaneous	–27	+2
Liquidity at the end of the year (Dec. 31)	**3,799**	3,120

[1] Adjusted figures

Report on post-balance sheet date events

There were no events of material importance subsequent to the end of the reporting period that have not been covered in the business report section.

Outlook

Improved economic prospects

Based on our own forecasts, we expect economic conditions to improve slightly in 2014. We expect global economic growth of 2.8 percent for 2014. Worldwide economic performance is thus unlikely to reach the long-term average growth rate of 3.3 percent.

Developed economies will probably contribute to this higher growth with a GDP increase of around 1.5 percent. We expect the European Union to grow by 0.7 percent in 2014, thanks in part to improvements in southern Europe. The pace of growth should pick up in North America. We expect the U.S. economy to grow by 2.3 percent. The strongest growth will continue to be in the emerging markets, especially in Asia. However, we do not expect the growth rate to accelerate significantly from the 2013 level – it is likely to be around 5 percent. India's 2014 growth rate is thus expected to lag considerably behind the growth rates of past years. China is expected to grow at the same level as in 2013.

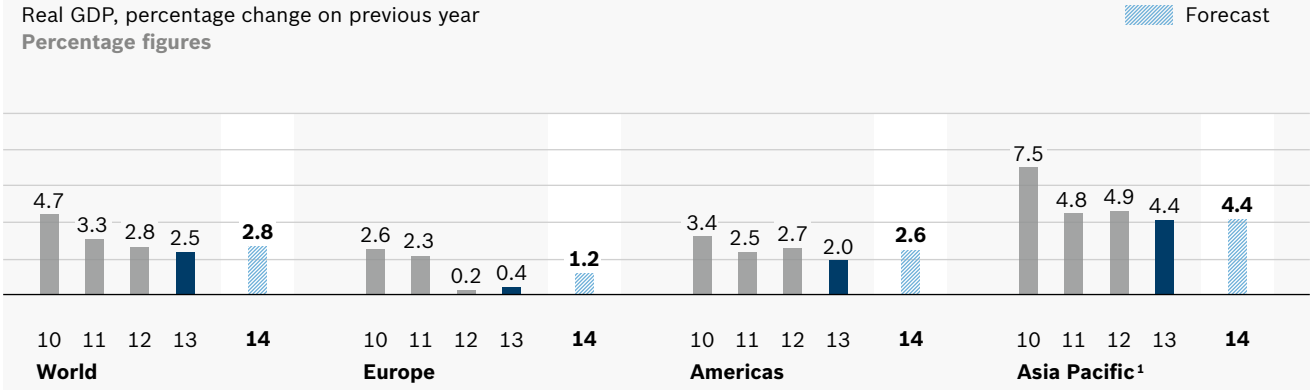
The ongoing euro crisis and undesirable structural trends in the emerging economies may also create substantial risks in 2014. Yet despite such risks, we rate the economic outlook for 2014 as more positive than in the previous two years.

In our core markets, we expect global production figures for passenger cars and commercial vehicles to grow by around 3 percent, to approximately 90 million vehicles. We project another slight recovery in worldwide production to result in around 1 percent growth for heavy trucks. In Europe, a slight increase in overall vehicle production is finally expected. In North America, we are forecasting an increase of 4 percent – the same as in the previous year. The biggest increase in overall production of passenger cars and commercial vehicles is expected to be in China.

F.15

Regional economic growth 2010 - 2014

Real GDP, percentage change on previous year
Percentage figures



[1] Including other countries

In mechanical engineering, we see opportunities for a gradual recovery and expect production to grow by 4 percent – an improvement, but still below the growth rates of previous years. This is due to many customers still operating below full capacity utilization. Private demand is expected to be somewhat stronger on a global level. In the southern European markets in particular, which are important for our business, we are expecting noteworthy growth for the first time since 2007. We believe that the global construction business – another important market – will see faster growth in 2014. Even in the euro zone, this segment should report a slight increase – the first since 2008.

Even though the economy remains subdued, we believe we can grow faster than in the previous year, both because of the expansion of our international presence and thanks to our innovative products. Our forecast continues to assume that the euro will remain at around 1.30 euros to the dollar. Given the global economic trend, we expect moderate price increases for metals and fuels compared to 2013.

Stronger year-on-year sales expected

Based on this, we expect the Bosch Group's sales growth to be within a range of 3 to 5 percent. From a present perspective, we see exchange-rate risks amounting to roughly one billion euros. The Automotive Technology business sector is likely to be able to increase its sales by a greater rate than the company as a whole; in Industrial Technology, we expect sales to be below the above-mentioned range due to the disposal of the Drive and Control Technology division's pneumatics business. At the same time, we once again want to achieve a slight improvement in the Bosch Group's earnings, both in terms of EBIT and of the operating value contribution.

Report on opportunities and risks

Opportunities

Well positioned with a focus on “Invented for life”

We believe that we are well positioned with our portfolio, offering products and services that are “Invented for life.” In addition, over both the medium and long term there are additional opportunities for growth in all our business sectors through expanding our already strong international presence. We thus want to participate especially in the above-average economic growth in Asia, South America, and increasingly also in Africa. To do so, we are increasingly offering products in those markets that are designed to meet customers’ specific requirements. Beyond that, we believe that there are significant opportunities for us if we offer further innovations – especially for mature markets such as Europe and North America, where the pace of economic growth is slower.

In the Automotive Technology business sector, increasingly strict emissions standards and the resulting increase in demand for eco-friendly powertrain technology will yield additional opportunities. This applies both to internal-combustion engines and, in the future, to electromobility, where we intend to establish a broad-based market presence. We see similar trends in vehicle safety technology – an area where standards are also becoming stricter. Yet regulatory requirements are not the only factor playing a role. Our customers as well are increasingly calling for eco-friendly products. This will provide us with opportunities in the Industrial Technology, Consumer Goods, and Energy and Building Technology sectors as well. In every business sector, greater connectivity via the internet of things and services will provide further opportunities for growth. We want to participate in this growth as well, and are developing a number of solutions and new business models. We believe that our broad product range is an advantage here, since it gives us profound insights into many industries and technical fields. At the same time, alliances offer further opportunities to develop new areas of business for the company.

Risks

Comprehensive risk management system

The Bosch Group's risk management system is part of strategic and operations control. From strategic planning at the group level through medium-term planning by the operating units to our operational controlling, we consistently use risk management tools.

For strategic planning at the group level, risks of group-wide importance are considered by analyzing the strategic portfolio, the technological portfolio, and the customer portfolio. Major medium-term risks are detected by the divisions, mainly through systematic business segment, competitor, and technology analyses.

As part of the operational controlling, an overview of all economically relevant transactions is compiled every month on the basis of a comprehensive reporting system, along with a list of major opportunities and risks. At meetings of committees such as the foreign exchange, raw materials, and investment committees, specific risks are examined on a regular basis. We use strategic financial planning and deploy standardized tools group-wide to minimize risks related to equity investments.

At all levels of risk management, a key element is defining and implementing measures derived from the risk management system. The board of management of Robert Bosch GmbH – with support from the corporate departments – is responsible for risks of group-wide importance. The executive management of the divisions and the presidents of the regional organizations are responsible for identifying risks at the point of origin and for managing any necessary measures.

Risk management in group accounting

The internal control and risk management system for group accounting ensures proper accounting and financial reporting. The main components are a mandatory group-wide chart of accounts, mandatory standards for bookkeeping systems, group-wide accounting manuals, and software for recording the necessary data and for consolidation. Changes in legislation or accounting standards are examined in regard to their relevance to the consolidated financial statements and are included during regular updating in the accounting manuals, charts of accounts, and consolidation software. Group-wide compliance is ensured though controls and technical advice from the corporate accounting department.

The consolidated financial statements are prepared centrally on the basis of data reported by subsidiaries. The data are initially checked for plausibility by the corporate accounting department, with the data being reviewed from different regional and specialist perspectives. Consolidation then follows. The principle of dual control applies at every level. The quality of data recording and consolidation is ensured by means of authorization and access regulations. The system is supplemented by internal control measures which are implemented locally according to uniform group-wide standards, in which financially critical processes are spot-checked for accuracy.

Overall risk assessment

On the basis of the information currently available and the individual risks listed in this report, there are no additional discernible opportunities or risks, apart from the market-related opportunities and risks listed in the outlook above, that could materially affect the net assets, financial position, and results of operations of the Bosch Group in fiscal 2014. Overall, the Bosch Group has no specific individual risk exposures that could jeopardize the group's continued existence as a going concern. An overall assessment of all risks shows that our forecast is plausible. There are no significant differences from the previous year that would affect this overall assessment.

Strategic and operating risks

We analyze risks to the business sectors by risk area. In particular, the areas monitored include sales, purchasing, technology, value-creation model, and business environment. We assess the risks identified. An important criterion here is the product of the estimated economic impact and the estimated probability of occurrence.

For the probability of occurrence, we use the categories "low" (up to 17 percent probability), "medium" (up to 32 percent probability), and "high" (up to 50 percent probability). Risks whose probability of occurrence is higher than 50 percent are given due consideration in our annual business planning. We categorize these risks' economic impact as low, medium, and high in terms of their relation to the anticipated accumulated EBIT of the respective business sector over a period of four years.

Particular risks – risks with at least a medium economic impact and probability of occurrence – relate in the case of the Automotive Technology business sector above all to achieving target market shares and delivery shares, and additionally to the market position in emerging countries, price trends, and market changes due to new business models, technologies, and competitors. We counter these risks through carefully coordinated, extensive planning and monthly tracking of acquisition results for long-term delivery contracts, intensive market surveillance, a broad customer portfolio, the deliberate expansion of our presence in emerging markets, and global trend scouting. Added to this is our extensive warranty exposure, which we counter with our quality management system.

In the Industrial Technology business sector, particular mention should be made of the high volatility of the markets in which the Drive and Control Technology division does business. This calls for additional flexibility, which we are constantly working to improve. We have also developed an early warning system to improve the speed with which we react to market changes. Depending on the forecast, we take operational control measures. Additional potential risks in this division include slow expansion of power generation from renewables and price erosion due to increasing competition. The particular risks in the Consumer Goods business sector are increases in prices of specific commodities, such as rare earth metals, and increasing price pressure on the market side. Measures include looking for alternative raw materials and sources of supply, and numerous projects aimed at lowering manufacturing costs before and after the market launch. In the Energy and Building Technology business sector, particular mention should be made of risks of price erosion in parts of the product portfolio and of a salability risk due to the high pace of innovation of IP technologies. Other risks include increasing costs for the services business. These risks can be countered by measures such as increasing productivity by expanding remote diagnostics and maintenance in the services sector and making quick adjustments to our product portfolio.

Due to our broad regional and sectoral presence, strategic and operating risks are on the whole broadly diversified. In every business sector, existing risks are transparent thanks to our risk management system. By implementing deliberate measures, we limit both the probability of occurrence and the economic impact of the risks.

IT risks: We have put in place comprehensive measures, valid throughout the company, to provide organizational and technical protection against all types of data loss, manipulation, and theft. We respond to the constantly growing demands and increasing awareness of data protection in social networks with our broad-based and well trained data-protection organization. We also protect our data against IT system failures by using redundant systems that run independently of location.

Legal risks, compliance: We do not anticipate any risks as a result of current or impending litigation or compliance issues that could materially impair the net assets, financial position, or results of operations of the Bosch Group in fiscal 2014. The principle of legality is an integral part of Bosch's values and is reinforced through a global compliance organization. There is a global hotline system that associates and third parties can use to report critical incidents. Worldwide classroom-based programs, web-based training courses, and a great number of publications are used to ensure that everyone in the group is aware of the need to comply with existing laws, rules, and regulations. We deal rigorously with violations of applicable laws or the Bosch Code of Business Conduct.

Since 2010, the EU Competition Commission and other antitrust authorities have been investigating a number of automotive suppliers for violations of antitrust laws. Bosch, too, faces such allegations and has set aside provisions totaling 150 million euros. The company is cooperating with the authorities in their investigations into these charges. In 2013, the Korean Fair Trade Commission imposed a fine of around 3.8 million euros on Bosch Electrical Drives Co., Ltd., Buyong, Korea, for exchanging prohibited information. Bosch has appealed the decision.

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

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

D

Consolidated Financial Statements of the Bosch Group

Income statement
for the period from January 1 to December 31, 2013

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Figures in millions of euros	Note	2013	2012*
Sales revenue	1	**46,068**	**44,703**
Cost of sales		–30,460	–30,084
Gross profit		**15,608**	**14,619**
Distribution and administrative cost	2	–8,562	–8,355
Research and development cost	3	–4,543	–4,442
Other operating income	4	1,480	1,201
Other operating expenses	5	–1,394	–1,304
Profit from entities consolidated using the equity method		162	399
EBIT		**2,751**	**2,118**
Financial income	6	1,535	2,830
Financial expenses	6	–1,459	–1,307
Profit before tax		**2,827**	**3,641**
Income taxes	7	–540	–487
Profit after tax from continuing operations		**2,287**	**3,154**
Profit after tax from discontinued operations		–1,036	–850
Profit after tax		**1,251**	**2,304**
of which attributable to non-controlling interests	8	155	66
of which attributable to parent company		1,096	2,238

* Figures after adjustment, see “Impact of changed accounting policies”

Statement of comprehensive income
for the period from January 1 to December 31, 2013

T.02

Figures in millions of euros	2013	2012*
Profit after tax	**1,251**	**2,304**
Change from marketable financial instruments		
recognized in other comprehensive income	249	535
of which attributable to non-controlling interests	2	6
transferred to profit or loss	–240	–1,293
of which attributable to non-controlling interests	–3	–3
Adjustment item from currency translation of entities outside the euro zone	–972	–267
of which attributable to non-controlling interests	–61	–23
Items that will be reclassified to profit or loss	**–963**	**–1,025**
of which entities consolidated using the equity method	–139	9
Remeasurement of pension provisions	202	–1,154
of which attributable to non-controlling interests	2	
Items that will not be reclassified to profit or loss	**202**	**–1,154**
of which entities consolidated using the equity method	6	–101
Other comprehensive income	**–761**	**–2,179**
Comprehensive income	**490**	**125**
of which attributable to non-controlling interests	95	46
of which attributable to parent company	395	79

* Figures after adjustment, see “Impact of changed accounting policies”

Statement of financial position
for the year ended December 31, 2013

T.03

Assets Figures in millions of euros	Note	12/31/2013	12/31/2012*	1/1/2012*
Current assets				
Cash and cash equivalents	10	3,799	3,120	2,892
Securities	11	593	734	674
Trade receivables	12	7,878	7,549	7,570
Income tax receivables		290	280	253
Other assets	13	1,921	1,957	1,585
Inventories	14	6,519	6,322	6,750
		21,000	**19,962**	**19,724**
Non-current assets				
Financial assets	15	10,461	9,363	9,560
Income tax receivables		135	152	138
Property, plant, and equipment	16	12,244	12,116	12,370
Intangible assets	17	7,178	6,612	5,487
Investments measured at equity		1,669	1,828	1,856
Deferred taxes	7	3,038	2,578	1,957
		34,725	**32,649**	**31,368**
Assets held for sale		**0**		
Total assets		**55,725**	**52,611**	**51,092**

* Figures after adjustment, see “Impact of changed accounting policies”

Equity and liabilities Figures in millions of euros	Note	12/31/2013	12/31/2012*	1/1/2012*
Current liabilities				
Financial liabilities	18	538	1,264	151
Trade payables	19	3,235	3,135	3,364
Income tax liabilities		186	142	161
Other liabilities	20	4,305	3,843	3,967
Income tax provisions		505	349	406
Other provisions	20	2,826	2,210	2,323
		11,595	**10,943**	**10,372**
Non-current liabilities				
Financial liabilities	18	4,003	2,806	3,508
Other liabilities	20	186	218	384
Pension provisions	21	7,613	7,732	6,233
Income tax provisions		275	287	287
Other provisions	20	3,325	2,732	2,574
Deferred taxes	7	1,042	993	793
		16,444	**14,768**	**13,779**
Liabilities held for sale		**0**		
Equity	22			
Issued capital		1,200	1,200	1,200
Capital reserve		4,557	4,557	4,557
Retained earnings		20,921	20,607	20,653
Unappropriated earnings		88	88	88
Non-controlling interests		920	448	443
		27,686	**26,900**	**26,941**
Total equity and liabilities		**55,725**	**52,611**	**51,092**

Statement of changes in equity

T.04

Figures in millions of euros			Retained earnings			
	Issued capital	Capital reserve	Earned profit	Treasury stock	Currency translation	
1/1/2012 before adjustment	**1,200**	**4,557**	**19,838**	**–62**	**549**	
Adjustment from IAS 31			4			
Adjustment from IAS 19			60			
1/1/2012 after adjustment	**1,200**	**4,557**	**19,902**	**–62**	**549**	
Comprehensive income					–244	
Dividends						
Transfer to retained earnings			2,150			
Other changes						
12/31/2012	**1,200**	**4,557**	**22,052**	**–62**	**305**	
Comprehensive income					–911	
Dividends						
Transfer to retained earnings			1,008			
Other changes						
12/31/2013	**1,200**	**4,557**	**23,060**	**–62**	**–606**	

Other comprehensive income						
Securities	Other	Total	Unappropriated earnings	Equity parent company	Equity non-controlling interests	Group equity
1,278	**–1,014**	**813**	**88**	**26,434**	**483**	**26,917**
				4	–40	–36
				60		60
1,278	**–1,014**	**813**	**88**	**26,498**	**443**	**26,941**
–761	–1,154	–2,159	2,238	79	46	125
			–88	–88	–27	–115
			–2,150			
	–37	–37		–37	–14	–51
517	**–2,205**	**–1,383**	**88**	**26,452**	**448**	**26,900**
10	200	–701	1,096	395	95	490
			–88	–88	–81	–169
			–1,008			
	7	7		7	458	465
527	**–1,998**	**–2,077**	**88**	**26,766**	**920**	**27,686**

Statement of cash flows

T.05

Figures in millions of euros	Note 23	2013	2012*
Profit before tax		1,547	2,637
Depreciation and amortization[1]		2,572	3,044
Increase in pension provisions		82	23
Increase in non-current provisions		602	110
Gains on disposal of non-current assets		–64	–1,174
Losses on disposal of non-current assets		105	328
Remeasurement of investments		–437	
Gains on disposal of securities		–344	–423
Losses on disposal of securities		79	88
Gains from investments measured at equity		–162	–399
Financial income		–597	–609
Financial expenses		855	662
Interest and dividends received		507	601
Interest paid		–207	–223
Paid income taxes		–582	–612
Cash flow		**3,956**	**4,053**
Change in inventories		–312	542
Increase in receivables and other assets		–369	–348
Change in liabilities		343	–810
Change in current provisions		658	–244
Cash flows from operating activities (A)		**4,276**	**3,193**
Acquisition of subsidiaries and other operating units		–15	–1,060
Disposal of subsidiaries and other operating units		1	95
Additions to non-current assets		–3,138	–3,608
Proceeds from disposal of non-current assets		301	1,237
Purchase of securities		–7,249	–5,399
Disposal of securities		6,228	5,502
Cash flows from investing activities (B)		**–3,872**	**–3,233**
Acquisition of non-controlling interests			–40
Borrowing		1,789	743
Repayment of financial liabilities		–1,318	–322
Dividends paid		–169	–115
Cash flows from financing activities (C)		**302**	**266**
Increase in liquidity (A+B+C)		**706**	**226**
Liquidity at the beginning of the period (January 1)		**3,120**	**2,892**
Exchange-rate related decrease in liquidity		–74	–6
Increase in liquidity due to changes in the consolidated group		47	8
Liquidity at the end of the period (December 31)		**3,799**	**3,120**

* Figures after adjustment, see "Impact of changed accounting policies"

[1] After offsetting reversals of impairments of EUR 7 million (previous year: EUR 84 million)

Notes to the financial statements
Principles and methods

General explanations

The consolidated financial statements of the Bosch Group for the year ended December 31, 2013, have been prepared according to the standards issued by the *International Accounting Standards Board* (IASB), London. The International Financial Reporting Standards (IFRSs) and the Interpretations of the International Financial Reporting Interpretations Committee (IFRS IC) applicable in the EU at the end of the reporting period have been applied. The previous-year figures have been determined using the same principles.

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

The EU-endorsed standards IFRS 10 *Consolidated Financial Statements,* IFRS 11 *Joint Arrangements,* and IFRS 12 *Disclosures of Interests in Other Entities* (mandatory adoption for fiscal years beginning on or after January 1, 2014), as well as the amendments to IAS 27 *Separate Financial Statements,* IAS 28 *Investments in Associates and Joint Ventures,* and IAS 32 *Financial Instruments: Presentation* (mandatory adoption for fiscal years beginning on or after January 1, 2014) will not be early adopted. The first-time adoption of these standards is not expected to have any significant effects on the consolidated financial statements of the Bosch Group.

Effects of amended accounting and measurement methods are explained in the section "Impact of changes in accounting policies."

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

The preparation of consolidated financial statements in accordance with IFRSs requires that assumptions be made for some items. These assumptions have an effect on the amount of the assets and liabilities, income and expenses, and contingent liabilities disclosed in the consolidated statement of financial position.

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

The consolidated financial statements prepared as of December 31, 2013, were authorized for disclosure by management on March 13, 2014. The consolidated financial statements and group management report will be filed with the Federal Gazette [*Bundesanzeiger*] and published there.

Basis of consolidation

Besides Robert Bosch GmbH, the consolidated financial statements include all subsidiaries for which Robert Bosch GmbH fulfills the criteria pursuant to IAS 27 *Consolidated and Separate Financial Statements,* or to which the interpretation of the Standing Interpretations Committee SIC 12 *Consolidation – Special Purpose Entities* apply. These entities are included in the consolidated financial statements from the date on which the Bosch Group obtains control. Conversely, subsidiaries are no longer included when control of the entity is lost.

The capital of the companies consolidated in the fiscal year for the first time is consolidated pursuant to IFRS 3 *Business Combinations* using the purchase method of accounting. At the time of combination, the purchase cost of the shares acquired is offset against pro-rata revalued equity. Assets, liabilities, and contingent liabilities are carried at fair value. Remain-

ing debit differences are accounted for as goodwill. Any credit differences are recognized through profit or loss. Any difference resulting from the purchase of additional non-controlling interests is offset against equity.

Joint ventures as defined by IAS 31 *Interests in Joint Ventures* are accounted for using the equity method.

Pursuant to IAS 28 *Investments in Associates,* investments are also included in consolidation using the equity method if significant influence can be exercised. At present, no associates have been accounted for using the equity method.

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

Currency translation

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

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

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

T.06

		Closing rate		Average rate	
	1 EUR =	12/31/2013	12/31/2012	2013	2012
Australia	AUD	1.54	1.27	1.38	1.24
Brazil	BRL	3.26	2.70	2.87	2.51
China	CNY	8.42	8.32	8.22	8.11
Czech Republic	CZK	27.43	25.14	25.97	25.14
Hungary	HUF	296.91	291.29	296.97	289.32
India	INR	85.37	72.56	77.93	68.60
Japan	JPY	144.72	113.61	129.66	102.49
Korea	KRW	1,450.93	1,406.04	1,455.91	1,448.82
Poland	PLN	4.15	4.07	4.20	4.19
Russian Federation	RUB	44.97	40.23	42.29	39.95
Switzerland	CHF	1.23	1.21	1.23	1.21
Turkey	TRY	2.96	2.36	2.53	2.31
United Kingdom	GBP	0.83	0.82	0.85	0.81
USA	USD	1.38	1.32	1.33	1.28

Accounting policies

Cash and cash equivalents consist of cash, reserve bank deposits, and bank balances with an original maturity of less than 90 days. Measurement is at amortized cost.

Trade receivables, income tax receivables, other assets (current), and **other financial assets (non-current)** are measured at amortized cost. All discernible specific risks and general credit risks are accounted for by appropriate valuation allowances. According to internal group guidelines, the carrying amounts of receivables are generally corrected via a valuation allowance account. For finance leases under which the Bosch Group is the lessor, a receivable is disclosed equivalent to the net investment value. Leases under which substantially all risks and rewards in connection with ownership have been transferred to the lessee are classified as finance leases. Derivative financial instruments are measured at fair value.

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

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

Depreciation is based on the following ranges of useful lives:

T.07

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

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

In accordance with IAS 17 *Leases,* leased items of property, plant, and equipment which for economic purposes are deemed to be purchases of assets with long-term financing (finance leases) are recognized at the time of addition at the lower of fair value or present value of the minimum lease payments. Depreciation is charged over the economic useful life. If it is uncertain whether title to the leased asset will be transferred, the asset is depreciated over the term of the lease agreement (if shorter than the economic useful life). The finance expense from these leases is disclosed under other financial expenses.

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

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

Purchased and internally generated intangible assets are capitalized pursuant to IAS 38 *Intangible Assets* if a future economic benefit will flow to the entity from the use of the asset and the cost of the asset can be reliably determined. These assets are generally carried at cost and amortized using the straight-line method over their economic useful life. As a rule, the useful life is four years. Intangible assets accounted for in the course of business combinations have a useful life of up to 20 years.

Borrowing costs incurred in connection with the acquisition, construction, or production of qualifying assets are included in the cost of this asset for the period of time until the asset is commissioned and subsequently written off with the asset concerned. Other borrowing costs are recorded as expenses.

Goodwill from business combinations represents the difference between the purchase price on the one hand and the pro-rata fair value of the equity at the time of acquisition on the other. Goodwill is allocated to the cash-generating units and tested annually for impairment. If the recoverable amount of the cash-generating unit does not cover the carrying amount of the net asset, impairment losses are charged in accordance with the requirements of IAS 36.

Pursuant to IFRS 1 *First-time Adoption of International Financial Reporting Standards,* goodwill existing as of January 1, 2004 (date of transition) was transferred at the carrying amount in accordance with the provisions of the German Commercial Code. Goodwill is also tested for impairment pursuant to the provisions of IAS 36.

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

Shares in jointly controlled entities are consolidated using the equity method. The carrying amount of these shares is subsequently measured in accordance with the change in equity of the jointly controlled entity attributable to the Bosch Group.

Financial instruments
A financial instrument is any contract that gives rise to a financial asset of one entity on the one hand and to a financial liability or equity instrument of a second entity on the other. As a rule, financial instruments are determined as of the settlement date. Financial instruments are accounted for at amortized cost or fair value. In the case of a financial asset or financial liability not accounted for at fair value through profit or loss, transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability are taken into account.

When determining the fair value, the input factors of the valuation methods pursuant to IFRS 13 *Fair Value Measurement* are categorized as follows:

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

The fair value of current financial assets and liabilities corresponds to the carrying amount.

Under IAS 39 *Financial Instruments: Recognition and Measurement,* the following categories of financial instruments are used in the Bosch Group:

- Held-to-maturity investments
- Loans and receivables
- Financial liabilities measured at amortized cost
- Assets and liabilities held for trading
- Available-for-sale financial assets

The fair-value option pursuant to IAS 39 is not exercised.

Financial investments held to maturity, loans and receivables, and current and non-current financial liabilities are measured at amortized cost using the effective interest method. These are mainly loans, trade receivables, and current and non-current other financial assets and liabilities. Impairments of loans and receivables to allow for credit risks based on past experience are recognized in the form of specific and general doubtful debt allowances. When determining valuation allowances for the general credit risk, financial assets that could potentially be impaired are grouped together by similar credit risk characteristics and collectively tested for impairment and, if necessary, written down.

Financial assets and liabilities held for trading are measured at fair value. Changes in value are recognized in profit or loss. These are derivative financial instruments which are mainly used to limit currency, interest, and commodity risks in accordance with internal risk management. Hedge accounting is not used in the Bosch Group.

Available-for-sale financial assets are those non-derivative financial assets that cannot be allocated to any of the preceding categories. They are carried at fair value. Unrealized gains and losses from changes in market value are disclosed in equity, net of deferred taxes, until they are realized. Interest received is generally recognized through profit and loss using the effective interest method. Dividends are recognized through profit and loss as soon as payment is legally enforceable. If impairment losses are necessary, the accumulated net loss is eliminated from equity and disclosed in profit or loss. If an impairment loss recorded on equity instruments is reversed in accordance with IAS 39, this is offset directly against equity. Reversals of impairment losses on debt instruments are recognized in profit or loss. They may not exceed the amount for which the impairment loss was recorded.

If the fair value of available-for-sale financial assets cannot be reliably determined, they are accounted for at acquisition cost. These are investments for which there is no active market. Necessary impairment losses are recognized in profit or loss and are not reversed.

As of the end of every reporting period, the carrying amounts of the financial assets which are not measured at fair value through profit or loss are examined for substantial objective indications that an asset may be impaired. Such indications may, for instance, be serious financial difficulties suffered by the debtor, the high probability that insolvency proceedings will be instituted against the debtor, the loss of an active market for the financial asset, a permanent drop in the fair value of the financial asset below amortized cost, or significant changes in the technological, economic, or legal environment, or in the market of the issuer. A possible impairment loss is given if the fair value of the asset is lower than the carrying amount. The fair value of loans and receivables is the present value of the estimated future cash flows discounted using the original effective interest rate.

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

Non-current assets and liabilities held for sale are classified as held for sale if most of their carrying amount will be redeemed by a sale and the sale is highly likely to be effected. They are valued at the lower of carrying amount or fair value, less selling cost.

Liabilities are measured at amortized cost. Liabilities from finance leases are disclosed under other liabilities, at the present value of the future lease installments. The effective interest method is applied when measuring bonds.

Pursuant to IAS 19 *Employee Benefits,* **pension provisions** are recognized using the projected unit credit method, taking into account future estimated increases in pensions and salaries, among other things.

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

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

Revenue from the supply of products and goods or from the provision of services is recognized when title and risk is transferred to the purchaser, less sales deductions. Interest and lease income is recorded according to the contractual agreement and, where appropriate, accrued pro rata temporis. In the case of finance leases, the payments are divided up using actuarial methods.

Cost of sales contains the cost of internally manufactured goods and the cost price of resold merchandise. The production cost of internally manufactured goods contains materials and production cost that can be allocated directly, the allocable parts of indirect overheads, including the depreciation of production equipment and the amortization of other intangible assets, and the devaluation of inventories.

Development cost that cannot be recognized is charged against income in the period incurred.

Impact of changed accounting policies

From the beginning of the fiscal year 2013, jointly controlled entities are no longer consolidated proportionately but by using the equity method. This amendment was made by way of exercising the option of IAS 31. Consolidation using the equity method provides more reliable information about the Bosch Group's share in jointly controlled entities. Reporting on these entities to management has been changed accordingly.

In addition, the provisions of the revised IAS 19 were also applied from January 1, 2013. Without this change, the provision for pensions and similar obligations would have been EUR 31 million higher, the provision for early phased retirement EUR 88 million higher, and EBIT would have been EUR 46 million lower in the fiscal year 2013.

In accordance with IAS 8, the previous-year figures for the 2013 consolidated financial statements were presented on a comparable basis in the income statement, the statement of comprehensive income, the statement of financial position, the statement of changes in equity, the statement of cash flows, and the notes to the consolidated financial statements.

The effects of applying the equity method in accordance with IAS 31 and the amended provisions of IAS 19 are presented in the following tables.

Impact on the income statement

In the following presentation of the income statement, the effects of the application of the provisions contained in IFRS 5 *Non-current Assets Held for Sale and Discontinued Operations* are presented in a separate column to allow the reconciliation to the figures presented in the income statement.

T.08

Figures in millions of euros	2012 before adjustment	IAS 31	IAS 19	IFRS 5	2012 after adjustment
Sales revenue	**52,464**	**–7,285**		**–476**	**44,703**
Cost of sales	–36,295	4,947	–13	1,277	–30,084
Gross profit	**16,169**	**–2,338**	**–13**	**801**	**14,619**
Distribution and administrative cost	–9,961	1,510	–4	100	–8,355
Research and development cost	–4,787	284	–1	62	–4,442
Other operating income	1,384	–173		–10	1,201
Other operating expenses	–1,495	154		37	–1,304
Result from investments measured at equity		399			399
EBIT	**1,310**	**–164**	**–18**	**990**	**2,118**
Financial income	2,924	–94			2,830
Financial expenses	–1,438	117		14	–1,307
Profit before tax	**2,796**	**–141**	**–18**	**1,004**	**3,641**
Income taxes	–454	124	–3	–154	–487
Profit after tax from continuing operations	**2,342**	**–17**	**–21**	**850**	**3,154**
Profit after tax from discontinued operations				–850	–850
Profit after tax	**2,342**	**–17**	**–21**		**2,304**
of which attributable to non-controlling interests	81	–15			66
of which attributable to parent company	2,261	–2	–21		2,238

Impact on the statement of comprehensive income

T.09

Figures in millions of euros	2012 before adjustment	IAS 31	IAS 19	2012 after adjustment
Profit after tax	**2,342**	**–17**	**–21**	**2,304**
Change from marketable financial instruments				
recognized in other comprehensive income	535			535
of which attributable to non-controlling interests	6			6
transferred to profit or loss	–1,293			–1,293
of which attributable to non-controlling interests	–3			–3
Adjustment item from currency translation of entities outside the euro zone	–266	–1		–267
of which attributable to non-controlling interests	–23			–23
Items that will be reclassified to profit or loss	**–1,024**	**–1**		**–1,025**
of which entities consolidated using the equity method		9		9
Remeasurement of pension provisions	–1,179		25	–1,154
of which attributable to non-controlling interests				
Items that will not be reclassified to profit or loss	**–1,179**		**25**	**–1,154**
of which entities consolidated using the equity method		–101		–101
Other comprehensive income	**–2,203**	**–1**	**25**	**–2,179**
Comprehensive income	**139**	**–18**	**4**	**125**
of which attributable to non-controlling interests	61	–15		46
of which attributable to parent company	78	–3	4	79

Impact on the statement of financial position

T.10

Figures in millions of euros Assets	Dec. 31, 2012, before adjustment	IAS 31	IAS 19	Dec. 31, 2012 after adjustment	Jan. 1, 2012 before adjustment	IAS 31	IAS 19	Jan. 1, 2012 after adjustment
Current assets								
Cash and cash equivalents	3,587	–467		3,120	3,328	–436		2,892
Securities	760	–26		734	718	–44		674
Trade receivables	9,169	–1,620		7,549	9,156	–1,586		7,570
Income tax receivables	324	–44		280	292	–39		253
Other assets	2,153	–196		1,957	1,816	–231		1,585
Inventories	7,168	–846		6,322	7,659	–909		6,750
	23,161	**–3,199**		**19,962**	**22,969**	**–3,245**		**19,724**
Non-current assets								
Financial assets	9,818	–455		9,363	9,942	–382		9,560
Income tax receivables	152			152	139	–1		138
Property, plant, and equipment	13,571	–1,455		12,116	13,776	–1,406		12,370
Intangible assets	6,798	–186		6,612	5,654	–167		5,487
Investments measured at equity		1,828		1,828		1,856		1,856
Deferred taxes	2,826	–222	–26	2,578	2,136	–154	–25	1,957
	33,165	**–490**	**–26**	**32,649**	**31,647**	**–254**	**–25**	**31,368**
Total assets	**56,326**	**–3,689**	**–26**	**52,611**	**54,616**	**–3,499**	**–25**	**51,092**
Equity and liabilities								
Current liabilities								
Financial liabilities	1,364	–100		1,264	437	–286		151
Trade payables	4,034	–899		3,135	4,241	–877		3,364
Income tax liabilities	165	–23		142	176	–15		161
Other liabilities	4,469	–626		3,843	4,566	–599		3,967
Income tax provisions	373	–24		349	413	–7		406
Other provisions	2,543	–333		2,210	2,688	–365		2,323
	12,948	**–2,005**		**10,943**	**12,521**	**–2,149**		**10,372**
Non-current liabilities								
Financial liabilities	3,297	–491		2,806	3,851	–343		3,508
Other liabilities	279	–61		218	453	–69		384
Pension provisions	8,534	–774	–28	7,732	6,861	–606	–22	6,233
Income tax provisions	347	–60		287	337	–50		287
Other provisions	3,034	–231	–71	2,732	2,866	–229	–63	2,574
Deferred taxes	1,003	–15	5	993	810	–17		793
	16,494	**–1,632**	**–94**	**14,768**	**15,178**	**–1,314**	**–85**	**13,779**
Equity								
Issued capital	1,200			1,200	1,200			1,200
Capital reserve	4,557			4,557	4,557			4,557
Retained earnings	20,536	3	68	20,607	20,589	4	60	20,653
Unappropriated earnings	88			88	88			88
Non-controlling interests	503	–55		448	483	–40		443
	26,884	**–52**	**68**	**26,900**	**26,917**	**–36**	**60**	**26,941**
Total equity and liabilities	**56,326**	**–3,689**	**–26**	**52,611**	**54,616**	**–3,499**	**–25**	**51,092**

Impact on the statement of cash flows

T.11

Figures in millions of euros	2012 before adjustment	IAS 31	IAS 19	2012 after adjustment
Profit before tax	2,796	–141	–18	2,637
Depreciation and amortization[1]	3,320	–276		3,044
Change in pension provisions	25	–23	21	23
Change in non-current provisions	134	–16	–8	110
Gains on disposal of non-current assets	–1,183	9		–1,174
Losses on disposal of non-current assets	334	–6		328
Gains on disposal of securities	–439	16		–423
Losses on disposal of securities	94	–6		88
Gains from investments measured at equity		–399		–399
Financial income	–654	45		–609
Financial expenses	729	–67		662
Interest and dividends received	400	201		601
Interest paid	–248	25		–223
Paid income taxes	–770	158		–612
Cash flow	**4,538**	**–480**	**–5**	**4,053**
Change in inventories	555	–13		542
Change in receivables and other assets	–364	16		–348
Change in liabilities	–785	–30	5	–810
Change in current provisions	–257	13		–244
Cash flows from operating activities (A)	**3,687**	**–494**		**3,193**
Acquisition of subsidiaries and other operating units	–1,060			–1,060
Disposal of subsidiaries and other operating units	76	19		95
Additions to non-current assets	–4,083	475		–3,608
Proceeds from disposal of non-current assets	1,263	–26		1,237
Purchase of securities	–5,894	495		–5,399
Disposal of securities	5,961	–459		5,502
Cash flows from investing activities (B)	**–3,737**	**504**		**–3,233**
Acquisition of non-controlling interests	–40			–40
Borrowing	1,291	–548		743
Repayment of financial liabilities	–828	506		–322
Dividends paid	–116	1		–115
Cash flows from financing activities (C)	**307**	**–41**		**266**
Change in liquidity (A+B+C)	**257**	**–31**		**226**
Liquidity at the beginning of the period (January 1)	**3,328**	**–436**		**2,892**
Exchange-rate related change in liquidity	–6			–6
Increase in liquidity due to changes in the consolidated group	8			8
Liquidity at the end of the period (December 31)	**3,587**	**–467**		**3,120**

[1] After offsetting reversals of impairments of EUR 84 million (before adjustment EUR 91 million)

Consolidation

Consolidated group

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

Besides Robert Bosch GmbH, the consolidated group comprises a further 360 (previous year: 361) fully consolidated companies. The group developed as follows:

T.12

	Germany	Outside Germany	Total
Included in consolidation at December 31, 2011	**59**	**291**	**350**
Additions/formations in fiscal year 2012	11	47	58
Disposals/mergers in fiscal year 2012	8	38	46
Included in consolidation at December 31, 2012	**62**	**300**	**362**
Additions/formations in fiscal year 2013	2	12	14
Disposals/mergers in fiscal year 2013	1	14	15
Included in consolidation at December 31, 2013	**63**	**298**	**361**

Pursuant to SIC 12, the consolidated group contains special funds and other investments for which the Bosch Group bears the economic risks and rewards.

In the fiscal year 2013, the following companies were included in the consolidation for the first time:

- Bosch Engineering GmbH, Abstatt (formerly Bosch Systems Engineering, Holzkirchen), Germany,
- Bosch Silicon Trading GmbH, Erfurt, Germany,
- Robert Bosch S.A., Santiago de Chile, Chile,
- Bosch Automotive Products (Chengdu) Co., Ltd., Chengdu, China,
- United Automotive Electronic Systems Co., Ltd., Shanghai, China,
- Bosch Electrical Drives India Private Ltd., Chennai, India,
- Bosch Energy and Building Solutions Italy S.r.l., Cinisello Balsamo, Italy,
- Bosch Pouch Systems AG, Beringen, Switzerland.

Due to corporate restructuring and mergers, the number of subsidiaries included in consolidation was reduced by a total of 15.

Due to changes to the consolidated group, sales revenue increased by EUR 1,933 million and total assets by EUR 1,540 million.

Joint ventures

From the beginning of the fiscal year 2013, the following jointly controlled companies were included in the consolidated financial statements using the equity method in accordance with IAS 31:

- Bosch Mahle Turbo Systems GmbH & Co. KG, Stuttgart, Germany (50 percent),
- BSH Bosch und Siemens Hausgeräte GmbH, Munich, Germany (50 percent),
- EM-motive GmbH, Hildesheim, Germany (50 percent),
- ZF Lenksysteme GmbH, Schwäbisch Gmünd, Germany (50 percent),
- Associated Fuel Pump Systems Corporation, Anderson, SC, USA (50 percent).

The main items of the statements of financial position of the entities accounted for using the equity method

T.13

Figures in millions of euros	2013	2012
Current assets	3,398	3,338
Non-current assets	2,390	2,311
Current liabilities	2,110	2,134
Non-current liabilities	1,953	1,642

The main items of the income statements of the entities accounted for using the equity method

T.14

Figures in millions of euros	2013	2012
Income	7,633	8,032
Expenses	7,452	7,617

The share of contingent liabilities of these companies attributable to the Bosch Group amounts to EUR 3 million (previous year: EUR 8 million).

Business combinations

In the fiscal year, the Bosch Group acquired a 100 percent shareholding in Bosch Energy and Building Solutions Italy S.r.l., Cinisello Balsamo, Italy. The business combination was financed by transferring cash and cash equivalents, and had no material impact on the sales revenue and result of the Bosch Group.

From the beginning of fiscal year 2013, Robert Bosch GmbH had the possibility to control United Automotive Electronic Systems Co., Ltd., Shanghai, China. From January 1, 2013, this company was therefore included in the consolidated financial statements of the Bosch Group as a subsidiary. Current assets of EUR 542 million (of which cash and cash equivalents EUR 44 million), non-current assets of EUR 330 million, current liabilities of EUR 439 million, and non-current liabilities of EUR 41 million were taken over in the process. In the purchase price allocation process, intangible assets amounting to EUR 653 million were identified that had previously not been accounted for, as well as current and non-current assets amounting to EUR 33 million. This gave rise to goodwill of EUR 174 million.

The purchase price allocation process relating to the acquisition of Service Solutions group, Warren, MI, USA, that was completed in the fiscal year resulted in a reduction in deferred tax assets and goodwill of EUR 69 million.

Discontinued operations

In March 2013, the management of the Bosch Group announced its decision to withdraw from crystalline photovoltaics and thus to discontinue production of ingots, wafers, cells, and modules. The reason for the exit was the significant overcapacity in the industry, leading to a protracted and substantial drop in prices. Despite extensive steps taken to contain costs, it was not possible to make the area competitive.

Agreements about the sale of a large part of the activities of Bosch Solar Energy AG, Arnstadt, Germany, were concluded in the fall of 2013. In early 2014, the contract to sell the module activities at the Prenzlau location, Germany, was signed by aleo solar AG, Prenzlau, Germany. The sale of the module plant in Vénissieux, France, is also planned.

The result of discontinued operations breaks down as follows:

T.15

Figures in millions of euros	2013	2012
Sales revenue	306	476
Other income	51	10
Expenses	–1,637	–1,490
Result of discontinued operations	**–1,280**	**–1,004**
Income taxes	244	154
Result after tax	**–1,036**	**–850**
of which attributable to non-controlling interests	–10	–8
of which attributable to parent company	–1,026	–842

The effects of the discontinued operations on the statement of comprehensive income are presented below:

T.16

Figures in millions of euros	2013	2012
Result after tax	**–1,036**	**–850**
Items that will be reclassified to profit or loss	1	0
Items that will not be reclassified to profit or loss	1	–4
Comprehensive income	**–1,034**	**–854**
of which attributable to non-controlling interests	–10	–8
of which attributable to parent company	–1,024	–846

The cash flows of the discontinued operations break down as follows:

T.17

Figures in millions of euros	2013	2012
Operating activities	–167	–259
Investing activities	–1	–67
Financing activities	7	1

The pneumatics business unit of the Drive and Control Technology division was sold as of January 1, 2014. The pneumatics business unit is still contained in the 2013 consolidated financial statements with assets amounting to EUR 162 million and liabilities amounting to EUR 134 million.

Notes to the income statement

1 Sales revenue

Sales revenue amounted to EUR 46,068 million (previous year: EUR 44,703 million). The Automotive Technology business sector accounted for EUR 30,588 million (previous year: EUR 28,668 million) of this total, the Industrial Technology business sector for EUR 6,844 million (previous year: EUR 7,541 million), the Consumer Goods business sector for EUR 3,979 million (previous year: EUR 4,045) million, and the Energy and Building Technology business sector for EUR 4,551 million (previous year: EUR 4,382 million). Sales revenue that cannot be allocated to the business sectors came to EUR 106 million (previous year: EUR 67 million). Sales revenue of EUR 306 million attributable to discontinued operations (previous year: EUR 476 million) relates solely to the Energy and Building Technology business sector.

2 Distribution cost and administrative expenses

T.18

Figures in millions of euros	2013	2012
Administrative expenses	2,454	2,310
Distribution cost	6,309	6,145
	8,763	**8,455**
Discontinued operations	–201	–100
	8,562	**8,355**

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

3 Research and development cost

Research and development cost contains both research cost as well as development cost that cannot be capitalized and depreciation on recognized development cost. In addition, it includes development work charged directly to customers.

T.19

Figures in millions of euros	2013	2012
Total research and development cost	4,615	4,591
Development cost recognized in the reporting period	–233	–210
Depreciation on recognized development cost	179	123
	4,561	**4,504**
Discontinued operations	–18	–62
	4,543	**4,442**

4 Other operating income

T.20

Figures in millions of euros	2013	2012
Income from exchange-rate fluctuations	472	607
Income from the reversal of valuation allowances on receivables and other assets	55	44
Income from the disposal of non-current assets	63	50
Income from rent and leases	9	11
Income from the reversal of provisions	55	46
Sundry other operating income	877	453
	1,531	**1,211**
Discontinued operations	–51	–10
	1,480	**1,201**

Sundry other operating income contains EUR 437 million resulting from the remeasurement of the net assets of United Automotive Electronic Systems Co., Ltd., Shanghai, China, that was included in the consolidation for the first time.

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

Leases are accounted for according to the rules pertaining to operating leases, provided that the substantial risks and rewards associated with the leased asset rest with the lessor. The assets concerned are recognized in property, plant, and equipment, and the lease payments received, provided they are not disclosed as sales revenue, are recorded in other operating income.

Government grants related to income amounted to EUR 82 million (previous year: EUR 69 million). They are offset against the respective expenses. If there are no such expenses, the grants are disclosed in sundry other operating income.

5 Other operating expenses

T.21

Figures in millions of euros	2013	2012
Expenses from exchange-rate fluctuations	555	524
Valuation allowances on receivables and other assets	233	100
Expenses from the disposal of non-current assets	101	112
Other taxes	47	45
Expenses from the recognition of provisions	167	146
Impairment of goodwill	39	
Sundry other operating expenses	561	414
	1,703	**1,341**
Discontinued operations	–309	–37
	1,394	**1,304**

6 Financial result

T.22

Figures in millions of euros	2013	2012
Investment income	5	3
Result from the disposal of investments	–2	1,104
Income from investments	**3**	**1,107**
Interest and similar income	305	335
Interest and similar expenses	–172	–198
Interest result	**133**	**137**
Gains on disposal of securities	344	423
Losses on disposal of securities	–79	–88
Exchange-rate gains	458	583
Exchange-rate losses	–806	–602
Gains on derivatives	377	332
Losses on derivatives	–276	–247
Other income	46	50
Other expenses	–131	–186
Other financial result	**–67**	**265**
Financial result, total	**69**	**1,509**
of which financial income	1,535	2,830
of which financial expenses	–1,466	–1,321
Discontinued operations	7	14
	76	**1,523**

The positions “gains/losses on derivatives” contain transactions to hedge financial assets. The position “other expenses” contains impairments of securities totaling EUR 10 million (previous year: EUR 6 million).

Capitalized borrowing costs of EUR 17 million (previous year: EUR 13 million) were deducted from interest expenses. The underlying borrowing rate is 4.0 percent (previous year: 4.5 percent).

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

T.23

Figures in millions of euros	2013		2012	
	Interest income	Interest expenses	Interest income	Interest expenses
Loans and receivables	64		78	
Available-for-sale financial assets	240		254	23
Financial liabilities measured at amortized cost		172		175
	304	**172**	**332**	**198**

7 Income taxes

Income taxes are classified according to their origin as follows:

T.24

Figures in millions of euros	2013	2012
Current taxes	786	572
Deferred taxes	–490	–239
	296	**333**
Discontinued operations	244	154
	540	**487**

Deferred taxes are calculated on the basis of the tax rates that apply or that are expected to apply given the current legislation in the individual countries at the expected time of realization. The corporate income tax rate for German companies is 15 percent. Taking into account the solidarity surcharge of 5.5 percent and the trade tax levied on profits recorded in Germany, the total tax rate is 29 percent. The tax rates outside Germany range between 7 percent and 41 percent.

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

T.25

Figures in millions of euros	2013		2012	
	Assets	Liabilities	Assets	Liabilities
Receivables, other assets, and inventories	424	140	370	163
Securities, investments	7	294	10	350
Property, plant, and equipment	273	430	270	471
Intangible assets	178	583	95	532
Other assets	76	1	33	
Liabilities	405	42	304	33
Provisions	1,725	44	1,465	44
Other liabilities	1	22	1	22
Unused tax losses and tax credits	463		652	
Total	**3,552**	**1,556**	**3,200**	**1,615**
Netting	–514	–514	–622	–622
	3,038	**1,042**	**2,578**	**993**

In the reporting period, deferred tax assets were written down by EUR 285 million (previous year: EUR 380 million).

There are EUR 762 million in unused tax losses for which no deferred tax assets have been recognized (previous year: EUR 1,195 million). Within the next three years, EUR 23 million (previous year: EUR 9 million) will be forfeited. In addition, deferred tax assets were not recognized on tax credits of EUR 136 million (previous year: EUR 122 million).

Consolidation measures give rise to deferred tax assets of EUR 114 million (previous year: EUR 131 million) and deferred tax liabilities of EUR 9 million (previous year: EUR 13 million).

In the reporting period, changed tax rates in the Bosch Group resulted in a deferred tax asset of EUR 8 million (previous year: EUR 2 million).

In the reporting period, deferred taxes of EUR 66 million (previous year: EUR 391 million) were recorded as other comprehensive income. Of this amount, EUR 49 million increases (previous year: reduction of EUR 60 million) the surplus from securities and EUR 17 million increases retained earnings due to the change in actuarial parameters in accordance with IAS 19 (previous year: EUR 451 million).

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

T.26

Figures in millions of euros	2013	2012
Profit before tax	2,827	3,641
Expected income tax expense	820	1,056
Variances due to tax rate	–88	–107
Non-deductible expenses	132	106
Zero-rated income	–244	–444
Other differences	–80	–124
Income tax expense disclosed	**540**	**487**
Effective tax rate	19%	13%

8 Non-controlling interests

Profits attributable to non-controlling interests amount to EUR 166 million (previous year: EUR 74 million). This is counterbalanced by losses of EUR 11 million (previous year: EUR 8 million).

9 Other notes to the income statement

In the reporting period, personnel expenses of EUR 14,907 million (previous year: EUR 14,198 million) were incurred.

Cost of materials amounted to EUR 20,640 million (previous year: EUR 20,483 million).

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

Notes to the statement of financial position

10 Cash and cash equivalents

T.27

Figures in millions of euros	2013	2012
Bank balances (term up to 90 days)	3,788	3,106
Cash and reserve bank deposits	11	14
	3,799	**3,120**
Assets held for sale	0	
	3,799	**3,120**

The bank balances are partly invested as secured deposits in tri-party repo transactions. As of the reporting date, the carrying value of the secured deposits is EUR 800 million. The bank provided collateral of the same amount in the form of securities.

11 Marketable securities (current)

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

12 Trade receivables

T.28

Figures in millions of euros	2013	2012
Trade receivables	7,878	7,549
Assets held for sale	0	
	7,878	**7,549**

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

Trade receivables totaling EUR 10 million (previous year: EUR 11 million) are due in more than one year.

13 Other assets (current)

T.29

Figures in millions of euros	2013	2012
Bank balances (term of more than 90 days)	130	180
Loan receivables	434	419
Receivables from finance leases	30	28
Derivative financial assets	50	53
Prepaid expenses	151	151
Receivables from tax authorities (without income tax receivables)	800	704
Receivables from board of management, associates	48	45
Sundry other receivables	278	377
	1,921	**1,957**
Assets held for sale	0	
	1,921	**1,957**

The receivables from finance leases stem from products leased by the Security Systems division. As a rule, the agreed term is ten years. The receivables are due as follows:

T.30

Figures in millions of euros	2013	2012
Gross capital expenditures on finance leases		
due not later than one year	39	38
due later than one year and not later than five years	117	114
due later than five years	54	52
	210	**204**
Present value of outstanding minimum lease payments		
due not later than one year	30	28
due later than one year and not later than five years	94	93
due later than five years	49	46
	173	**167**
Unearned finance income	**37**	**37**

There were no unguaranteed residual values.

The outstanding minimum lease payments from operating leases mainly stem from activities of the Security Systems division. The minimum lease payments are due as follows:

T.31

Figures in millions of euros	2013	2012
Due not later than one year	37	36
Due later than one year and not later than five years	103	108
Due later than five years	43	45
	183	**189**

14 Inventories

T.32

Figures in millions of euros	2013	2012
Raw materials, consumables, and supplies	2,070	1,969
Work in process	1,236	1,272
Finished goods and merchandise	3,008	2,813
Prepayments	205	268
	6,519	**6,322**
Assets held for sale	0	
	6,519	**6,322**

Of the total amount of inventories, an amount of EUR 247 million (previous year: EUR 254 million) is carried at the lower net selling price. In the fiscal year, impairment losses of EUR 20 million (previous year: EUR 25 million) were recognized in profit or loss. No inventories were pledged as collateral.

15 Non-current financial assets

T.33

Figures in millions of euros	2013	2012
Securities	8,631	7,552
Investments	1,278	1,160
Loan receivables	243	244
Receivables from finance leases	143	139
Derivative financial assets	23	72
Other receivables and other assets	143	196
	10,461	**9,363**
Assets held for sale	0	
	10,461	**9,363**

Loans with a residual term of more than five years amount to EUR 1 million (previous year: EUR 1 million). There are no other receivables due in more than five years.

Information about valuation allowances on loan receivables and finance lease receivables is contained in the credit risk section of the “Capital and risk management” chapter.

Non-current securities and investments
The securities consist of interest-bearing and other securities as well as shares which are not designated for sale within twelve months of the end of the reporting period.

The pledged securities have a carrying amount of EUR 1,008 million (previous year: EUR 539 million). The pledged securities satisfy the legal requirement to secure obligations to employees and bank guarantees. Medium-term interest-bearing securities and units equivalent to at least the value of the claims were pledged.

As of the reporting date, the group plans to sell unlisted investments on a small scale.

Non-current securities and investments developed as follows:

T.34

Figures in millions of euros	Available-for-sale financial assets				Total
	Investments		Securities		
	measured at fair value	measured at cost	Shares	Other	
Gross values 1/1/2012	**1,113**	**1,046**	**1,808**	**5,400**	**9,367**
Changes in consolidated group		50			50
Additions	242	287	1,315	3,167	5,011
Reclassifications		–1		–838	–839
Disposals	–985	–283	–1,316	–2,495	–5,079
Revaluations	72		281	249	602
Exchange differences	–1	–8	–7	–12	–28
Gross values 12/31/2012	**441**	**1,091**	**2,081**	**5,471**	**9,084**
Depreciation 1/1/2012		**318**			**318**
Changes in consolidated group		127			127
Additions		55			55
Disposals		–127			–127
Exchange differences		–1			–1
Depreciation 12/31/2012		**372**			**372**
Carrying amounts 12/31/2012	**441**	**719**	**2,081**	**5,471**	**8,712**
Gross values 1/1/2013	**441**	**1,091**	**2,081**	**5,471**	**9,084**
Changes in consolidated group		–275			–275
Additions	6	196	1,779	4,527	6,508
Reclassifications				–614	–614
Disposals	–1	–54	–1,547	–3,004	–4,606
Revaluations	147		232	–243	136
Exchange differences	–2	–18	–12	–39	–71
Gross values 12/31/2013	**591**	**940**	**2,533**	**6,098**	**10,162**
Depreciation 1/1/2013		**372**			**372**
Changes in consolidated group		–106			–106
Additions		20			20
Disposals		–31			–31
Exchange differences		–2			–2
Depreciation 12/31/2013		**253**			**253**
Carrying amounts 12/31/2013	**591**	**687**	**2,533**	**6,098**	**9,909**
Assets held for sale					0
					9,909

16 Property, plant, and equipment

T.35

Figures in millions of euros	Land, buildings belonging to operating assets	Investment property	Plant and equipment	Other equipment, furniture, and fixtures, leased assets	Prepayments and assets under construction	Total
Gross values 1/1/2012	**7,475**	**155**	**17,746**	**6,646**	**1,197**	**33,219**
Changes in consolidated group	–44		–276	20	27	–273
Additions	154	2	849	540	1,169	2,714
Reclassifications	82	2	712	90	–886	
Disposals	–120	–9	–1,170	–463	–36	–1,798
Exchange differences	–135	1	–255	–46	–14	–449
Gross values 12/31/2012	**7,412**	**151**	**17,606**	**6,787**	**1,457**	**33,413**
Depreciation 1/1/2012	**3,080**	**64**	**12,749**	**4,948**	**8**	**20,849**
Changes in consolidated group	–48		–277	–1		–326
Additions	402	3	1,624	634	26	2,689
Reclassifications	–49	5	95	–51		
Disposals	–52	–2	–1,031	–426		–1,511
Write-ups	–8		–75	–1		–84
Exchange differences	–78		–208	–34		–320
Depreciation 12/31/2012	**3,247**	**70**	**12,877**	**5,069**	**34**	**21,297**
Carrying amounts 12/31/2012	**4,165**	**81**	**4,729**	**1,718**	**1,423**	**12,116**
Gross values 1/1/2013	**7,412**	**151**	**17,606**	**6,787**	**1,457**	**33,413**
Changes in consolidated group	108		409	11	64	592
Additions	210		791	508	1,030	2,539
Reclassifications	171	1	541	255	–968	
Disposals	–84	–37	–699	–553	–96	–1,469
Exchange differences	–366	–2	–864	–173	–64	–1,469
Gross values 12/31/2013	**7,451**	**113**	**17,784**	**6,835**	**1,423**	**33,606**
Depreciation 1/1/2013	**3,247**	**70**	**12,877**	**5,069**	**34**	**21,297**
Changes in consolidated group	26		195	7		228
Additions	259	1	1,106	642		2,008
Reclassifications	8		–30	30	–8	
Disposals	–53	–35	–648	–493	–1	–1,230
Write-ups	–4		–3			–7
Exchange differences	–175		–637	–121	–1	–934
Depreciation 12/31/2013	**3,308**	**36**	**12,860**	**5,134**	**24**	**21,362**
Carrying amounts 12/31/2013	**4,143**	**77**	**4,924**	**1,701**	**1,399**	**12,244**
Assets held for sale						0
						12,244

The total depreciation charge contains the following impairment losses:

- Land and buildings: EUR 63 million (previous year: EUR 185 million)
- Plant and equipment: EUR 124 million (previous year: EUR 360 million)
- Other equipment, furniture, and fixtures: EUR 27 million (previous year: EUR 46 million)

In the past fiscal year, it was again not possible to offset the continuing sharp drop in prices in the solar industry. As a result, an impairment loss of EUR 81 million had to be recognized in the Solar Energy division. Impairment losses on land and buildings in this division came to EUR 49 million and on other property, plant, and equipment to EUR 32 million.

In the fiscal year 2013, over-capacity and high price pressure led to impairment losses of EUR 116 million in the Renewable Energies business unit.

The impairment test was carried out at business-unit level. The recoverable amount was assumed to be the fair value less costs to sell. The fair value was determined by means of a qualified estimate and expert appraisals.

The carrying amounts contain the following amounts from finance leases under which the Bosch Group is the lessee:

- Land and buildings: EUR 17 million (previous year: EUR 26 million)
- Plant and equipment: EUR 2 million (previous year: EUR 4 million)
- Other equipment, furniture, and fixtures: EUR 5 million (previous year: EUR 12 million)

The obligations entered into to purchase items of property, plant, and equipment amounted to EUR 343 million (previous year: EUR 394 million), restrictions on title totaled EUR 1 million (previous year: EUR 29 million). Government grants for assets of EUR 12 million (previous year: EUR 33 million) were deducted from the additions in the reporting period.

Investment property comprises rented properties which were measured at amortized cost. Measured at fair value, the portfolio comes to EUR 141 million (previous year: EUR 147 million). The fair values were calculated at corporate headquarters. The land and buildings allocated to level 3 of the fair value hierarchy pursuant to IFRS 13 are measured as follows: land in Germany (fair value EUR 45 million) is valued on the basis of existing purchase offers, residential property in Germany and Asia (fair value EUR 96 million) is valued using the discounted earnings or comparative method, based on the Ordinance on principles to assess the market value of land [Verordnung über die Grundsätze für die Ermittlung der Verkehrswerte von Grundstücken (ImmoWertV)] and taking the current fabric and market values of the individual properties into account. The rental income from investment property came to EUR 9 million (previous year: EUR 10 million), maintenance expenses totaled EUR 5 million (previous year: EUR 5 million).

A review of the useful lives of property, plant, and equipment revealed that special-purpose machinery is used for a longer period than previously estimated. The useful life on which depreciation is based was therefore extended to eight years. The effect of this change on the depreciation of property, plant, and equipment is presented in the following table:

T.36

Figures in millions of euros	2013	2014	2015	2016 - 2020
Depreciation of property, plant, and equipment	–179	–105	–19	303

17 Intangible assets

T.37

Figures in millions of euros	Acquired intangible assets (without goodwill)	Acquired goodwill	Internally generated intangible assets	Total
Gross values 1/1/2012	**2,507**	**4,799**	**898**	**8,204**
Changes in consolidated group	567	521		1,088
Additions	105	2	259	366
Reclassifications	–34	34		
Disposals	–59		–110	–169
Exchange differences	–16	–4		–20
Gross values 12/31/2012	**3,070**	**5,352**	**1,047**	**9,469**
Amortization 1/1/2012	**1,466**	**761**	**490**	**2,717**
Changes in consolidated group	–31	–6		–37
Additions	228		156	384
Disposals	–88		–110	–198
Exchange differences	–10	1		–9
Amortization 12/31/2012	**1,565**	**756**	**536**	**2,857**
Carrying amounts 12/31/2012	**1,505**	**4,596**	**511**	**6,612**
Gross values 1/1/2013	**3,070**	**5,352**	**1,047**	**9,469**
Changes in consolidated group	673	213	37	923
Additions	112	14	271	397
Disposals	–135	–74	–184	–393
Exchange differences	–92	–64		–156
Gross values 12/31/2013	**3,628**	**5,441**	**1,171**	**10,240**
Amortization 1/1/2013	**1,565**	**756**	**536**	**2,857**
Changes in consolidated group	10			10
Additions	291	39	223	553
Disposals	–132		–184	–316
Exchange differences	–37	–5		–42
Amortization 12/31/2013	**1,697**	**790**	**575**	**3,062**
Carrying amounts 12/31/2013	**1,931**	**4,651**	**596**	**7,178**
Assets held for sale				0
				7,178

The amount of amortization for the fiscal year contains the following impairment losses:

- Purchased intangible assets (without goodwill): EUR 7 million (previous year: EUR 7 million)
- Internally generated intangible assets: EUR 69 million (previous year: EUR 16 million)

The goodwill of EUR 4,651 million (previous year: EUR 4,596 million) is attributable to the divisions (cash generating units) as follows:

T.38

Figures in millions of euros	2013	2012
Gasoline Systems	271	101
Diesel Systems	54	54
Automotive Aftermarket	313	385
Drive and Control Technology	2,161	2,173
Packaging Technology	96	100
Power Tools	347	360
Security Systems	333	353
Thermotechnology	996	1,006
Other	80	64
	4,651	**4,596**

Goodwill is subjected to an annual impairment test. An impairment loss is recorded when the recoverable amount is below the carrying amount of the cash-generating unit. The recoverable amount is derived from the future cash flows. The cash flows are based on business plans with a planning period of five years.

For the Automotive Technology business sector, a growth rate of 1.0 percent (previous year: 1.0 percent) was applied, for Industrial Technology 2.0 percent (previous year: 2.0 percent), for Consumer Goods 2.0 percent (previous year: 2.0 percent), and for Energy and Building Technology 2.0 percent. For the Automotive Technology business sector, a pre-tax discount rate of 12.5 percent (previous year: 9.5 percent) was applied, for Industrial Technology 12.1 percent (previous year: 10.2 percent), for Consumer Goods 12.7 percent (previous year: 10.3 percent), and for Energy and Building Technology 11.5 percent. A risk-free interest rate of 2.5 percent (previous year: 2.1 percent) and a market risk premium of 6.0 percent (previous year: 5.5 percent) were assumed. The standard tax rate used is 29 percent (previous year: 29 percent).

In the reporting period, the competitive situation and the less dynamic market development led to an impairment of the goodwill in Healthcare Telemedicine of EUR 33 million.

18 Current and non-current financial liabilities

T.39

Figures in millions of euros	2013		2012	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Bonds		3,233	700	1,744
Promissory loans	346	154		500
Liabilities to banks	177	613	563	553
Other financial liabilities	15	3	1	9
	538	**4,003**	**1,264**	**2,806**
Liabilities held for sale	0	0		
	538	**4,003**	**1,264**	**2,806**

Financial liabilities amounting to EUR 1,952 million (previous year: EUR 759 million) are due in more than five years.

Bond conditions

T.40

					Figures in millions of euros	
Interest terms	**Interest rate**	**Beginning of term**	**End of term**	**Currency**	**Nominal**	**Fair value 12/31/2013**
Fixed	4.375%	05/2006	05/2016	EUR	750	815
Fixed	5.125%	06/2009	06/2017	EUR	600	686
Fixed	5.000%	08/2009	08/2019	EUR	300	353
Fixed	1.543%	08/2012	08/2017	EUR	100	100
Fixed	1.625%	05/2013	05/2021	EUR	500	484
Fixed	2.625%	05/2013	05/2028	EUR	750	722
Fixed	2.979%	05/2013	05/2033	EUR	250	234

19 Trade payables

T.41

Figures in millions of euros	2013	2012
Trade payables	3,220	3,120
Notes payable	15	15
	3,235	**3,135**
Liabilities held for sale	0	
	3,235	**3,135**

There are no trade payables which are due in more than one year.

20 Other liabilities and provisions

Sundry other liabilities

T.42

Figures in millions of euros	2013		2012	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Loans	142	18	90	40
Accruals in the personnel area	1,439		1,210	
Accruals in the sales and marketing area	460		430	
Other accruals	355		300	
Deferred income	146		158	
Tax liabilities (without income tax liabilities)	359		353	
Finance lease obligations	5	11	8	16
Deferred income from tooling compensation received	21	25	27	35
Prepayments received for inventories	533		553	
Derivative financial assets	55	33	43	25
Sundry other liabilities	790	99	671	102
	4,305	**186**	**3,843**	**218**
Liabilities held for sale	0	0		
	4,305	**186**	**3,843**	**218**

Loans with a residual term of more than five years amount to EUR 1 million (previous year: EUR 2 million). The sundry other liabilities with a residual term of more than five years amount to EUR 1 million (previous year: EUR 2 million).

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

Finance lease obligations primarily stem from vehicle lease agreements with terms of three to six years. The liabilities are due as follows:

T.43

Figures in millions of euros	2013	2012
Future minimum lease payments		
due not later than one year	6	10
due later than one year and not later than five years	12	17
due later than five years	9	11
Interest portion contained in the future minimum lease payments		
due not later than one year	1	2
due later than one year and not later than five years	5	6
due later than five years	5	6
Present value of outstanding minimum lease payments		
due not later than one year	5	8
due later than one year and not later than five years	7	11
due later than five years	4	5
	16	**24**

Provisions (without income tax provisions and pension provisions)

T.44

Figures in millions of euros	2013		2012	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Tax provisions (without income tax provisions)	17	63	21	86
Provisions in the personnel area	636	1,124	423	974
Provisions in the sales and marketing area	1,510	969	1,445	1,052
Other provisions	663	1,169	321	620
	2,826	**3,325**	**2,210**	**2,732**
Liabilities held for sale	0	0		
	2,826	**3,325**	**2,210**	**2,732**

Provisions developed as follows:

T.45

Figures in millions of euros	At 1/1/2013	Changes in consolidated group	Amounts used	Amounts reversed	Increase incl. increase in discounted amount	Exchange adjustments	At 12/31/2013
Tax provisions	743	1	–53	–121	314	–24	860
Provisions in the personnel area	1,397	39	–325	–91	752	–12	1,760
Provisions in the sales and marketing area	2,497	88	–750	–409	1,099	–46	2,479
Other provisions	941	34	–127	–121	1,143	–38	1,832
	5,578	**162**	**–1,255**	**–742**	**3,308**	**–120**	**6,931**
Liabilities held for sale	0						0
	5,578						**6,931**

Of the total increase in provisions, an amount of EUR 40 million (previous year: EUR 61 million) relates to increases in the discounted amount.

Provisions in the personnel area relate to obligations from personnel adjustment measures, from early phased retirement, and from other special benefits for which the time or amount cannot yet be precisely determined. Provisions in the sales and marketing area mainly take account of losses from delivery and warranty obligations, including risks from recall, exchange, and product liability cases. Other provisions are recognized, among other things, for risks from restructuring, purchasing obligations, and renewal obligations for rent and lease agreements.

Contingent liabilities and other financial obligations

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

T.46

Figures in millions of euros	2013	2012
Contingent liabilities related to notes issued and transferred	17	18
Contingent liabilities from guarantees	526	12
Contingent liabilities from warranties	0	1
Other contingent liabilities	10	5
	553	**36**

Obligations from operating leases mainly pertain to lease agreements for technical equipment, for IT equipment, for vehicles, and for buildings. The minimum amount of the undiscounted future payments from operating leases amounts to EUR 600 million (previous year: EUR 624 million).

The obligations are due as follows:

T.47

Figures in millions of euros	2013	2012
Due not later than one year	192	181
Due later than one year and not later than five years	322	357
Due later than five years	86	86
	600	**624**

The payments of the period recognized in profit or loss of EUR 228 million (previous year: EUR 192 million) are contained in the costs of the functional areas (cost of sales, and distribution, administrative, and research and development cost).

21 Provisions for pensions and similar obligations

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

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

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

Germany
The company pension scheme (Bosch bAV Plan), introduced on January 1, 2006, is a defined contribution plan with salary-based contributions. The Bosch bAV Plan is partly funded via an external pension fund. The value of the assets of the external pension fund is offset against the pension obligation calculated using the projected unit credit method. In Germany, the external pension funds are Bosch Pensionsfonds AG and Bosch Hilfe e.V.

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

Upon reaching retirement, or in the event of occupational disability or death, the earned benefits are paid out in the form of a lump-sum payment, pension payments, or a lifelong annuity.

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

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

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

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

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

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

United Kingdom
Bosch operates a frozen final-salary pension plan. The obligation is funded via a trust association which is legally independent of Bosch, and which is operated in accordance with the law. The trustees are required to comply with the legal requirements. The plan is in deficit and is being restructured.

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

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

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

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

Actuarial calculations and estimates are made for all defined benefit plans. Besides assumptions about life expectancy, and taking index-linked developments into account, the cal-

culations are based on the following parameters, which vary from one country to another depending on local economic circumstances:

T.48

Percentage figures	Germany		Japan		Switzerland		UK		USA		Total	
	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012
Discount rate	3.5	3.8	1.0	1.3	2.3	1.8	4.4	4.2	4.8	4.0	3.6	3.6
Future salary increases	3.0	3.0	2.5	2.5	2.0	2.0	4.1	3.6	3.5	4.3	3.0	3.1
Pension increases	1.8	1.8	n.a.	n.a.	0.2	0.3	3.1	2.9	n.a.	n.a.	1.6	1.6

n.a. not applicable

The discount rate in the euro zone was determined taking bonds into account which were rated AA by at least one rating agency at the balance-sheet date.

The estimates of future salary increases are made, among other things, on the basis of the economic situation and inflation.

The pension plans are measured using the current mortality tables as of December 31 of the fiscal year concerned. As of December 31, 2013, the following mortality tables are used in the key countries:

Germany	Heubeck mortality tables 2005G (modified)
Japan	EPF 2009
Switzerland	BVG 2010 generation for pensioners, BVG 2010 P18 for future beneficiaries
UK	S1PXA with 2011 CMI projections
USA	2014 IRC 430 mortality table

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

T.49

Figures in millions of euros	Present value of the obligation	Plan assets	Other asset	Unrecognized asset	Provision
At 12/31/2012					
Germany	8,463	–1,808			6,655
Japan	274	–194			80
Switzerland	952	–866	1		87
UK	221	–163			58
USA	1,733	–1,122			611
Other	360	–129		10	241
	12,003	**–4,282**	**1**	**10**	**7,732**
At 12/31/2013					
Germany	9,055	–2,064			6,991
Japan	211	–184	1		28
Switzerland	920	–906	10		24
UK	222	–170			52
USA	1,382	–1,091			291
Other	352	–141	4	12	227
	12,142	**–4,556**	**15**	**12**	**7,613**

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

T.50

Figures in millions of euros	Present value of the obligation	Plan assets	Other assets	Unrecognized asset	Provision
At 1/1/2013	**12,003**	**–4,282**	**1**	**10**	**7,732**
Pension cost charged to profit or loss					
Current service cost	442				442
Past service cost	1				1
Gains from plan settlements not related to past service cost	–1				–1
Net interest income/expense	423	–149		1	275
Other		6			6
	865	**–143**		**1**	**723**
Remeasurement					
Return on plan assets (excluding amounts included in net interest)		–236			–236
Losses arising from changes in demographic assumptions	33				33
Losses from changes in financial assumptions	73				73
Experience gains	–32				–32
Other adjustments		0		4	4
	74	**–236**		**4**	**–158**
Contributions					
Employer		–319			–319
Beneficiaries	15	–15			
	15	**–334**			**–319**
Benefits paid	–649	315			–334
Special effects (plan settlement)	2	–2			
Transfers	–1	0			–1
Currency translation	–169	127		–3	–45
Changes in consolidated group	2	–1			1
Changes in other assets			14		14
At 12/31/2013	**12,142**	**–4,556**	**15**	**12**	**7,613**

T.51

Figures in millions of euros	Present value of the obligation	Plan assets	Other asset	Unrecognized assets	Provision
At 1/1/2012	**9,994**	**–3,770**		**9**	**6,233**
Pension cost charged to profit or loss					
Current service cost	371				371
Past service cost	21				21
Gains from plan settlements not related to past service cost	–1				–1
Net interest income/expense	463	–165		1	299
Other		5			5
	854	**–160**		**1**	**695**
Remeasurement					
Return on plan assets (excluding amounts included in net interest)		–234			–234
Losses arising from changes in demographic assumptions					
Losses from changes in financial assumptions	1,635				1,635
Experience gains	76				76
Other adjustments		–4		1	–3
	1,711	**–238**		**1**	**1,474**
Contributions					
Employer		–323			–323
Beneficiaries	15	–15			
	15	**–338**			**–323**
Benefits paid	–512	174			–338
Special effects (plan settlement)	–10	10			
Transfers	–11	1			–10
Currency translation	–57	42		–1	–16
Changes in consolidated group	19	–3			16
Changes in other assets			1		1
At 12/31/2012	**12,003**	**–4,282**	**1**	**10**	**7,732**

The fund assets comprise the following components:

T.52

Percentage figures	Germany		Japan		Switzerland		UK		USA	
	2013	2012	2013	2012	2013	2012	2013	2012	2013	2012
Cash and cash equivalents	2	1	0	1	5	7			1	1
Equity instruments	36	33	41	41	21	20	46	45	48	48
of which Europe	58	58	11	11	55	70	70	72	14	12
of which North America	17	17	24	23	32	14	15	13	73	76
of which Asia Pacific	16	17	65	66	8	10	12	12	7	6
of which emerging markets	9	8			5	6	3	3	6	6
Debt instruments	48	49	53	53	22	25	48	48	51	51
of which government bonds	46	49	83	83	36	36	29	28	35	28
of which corporate bonds	43	39	6	6	39	43	71	72	65	72
of which other debt instruments	11	12	11	11	25	21				
Property	8	9			35	36				
Insurance	0		5	5			4	4		
Other	6	8	1	0	17	12	2	3		

Quoted prices in an active market are available for the asset classes cash, equity instruments, and debt instruments. For most other classes of assets, there are no quoted prices in an active market.

Duration and estimated maturities of the pension obligation
The weighted duration of the pension obligation as of December 31, 2013, is 14.7 years.

Estimated maturities of the undiscounted estimated pension payments

T.53

Figures in millions of euros	2013
Less than one year	501
Between one and two years	526
Between two and three years	531
	1,558

The estimated additions to plan assets in the fiscal year 2014 amount to EUR 343 million.

The estimated benefits to be paid directly in the fiscal year 2014 amount to EUR 328 million.

Sensitivity of the pension provision relating to actuarial parameters:

T.54

Percentage figures	Germany	Japan	Switzerland	UK	USA
Discount rate					
Increase of 0.5 percentage points	–6.0	–4.3	–5.0	–8.5	–6.1
Decrease of 0.5 percentage points	6.7	3.8	5.6	9.6	6.8
Salary increase					
Increase of 0.5 percentage points	0.1	0.7	0.3	0.9	0.0
Decrease of 0.5 percentage points	–0.1	–0.7	–0.3	–0.8	0.0
Pension increase					
Increase of 0.5 percentage points	0.7	n.a.	2.5	1.5	n.a.
Decrease of 0.5 percentage points	–0.6	n.a.	–2.4	–1.4	n.a.
Life expectancy					
Increase by one year	2.1	n.a.	3.3	4.1	2.7

n.a. not applicable

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

Defined contribution plans
Expenses for defined contribution plans amounted to EUR 841 million (previous year: EUR 837 million).

22 Equity

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

Shareholders of Robert Bosch GmbH

T.55

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

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

Retained earnings also consider treasury stock of EUR 62 million.

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

Non-controlling interests
The shares of non-controlling interests in the equity of the consolidated subsidiaries mainly comprise the non-controlling interests in United Automotive Electronic Systems Co., Ltd., Shanghai, Bosch Automotive Diesel Systems Co., Ltd., Wuxi, both China, and Bosch Ltd., Bangalore, India.

Changes mainly resulted from the first-time consolidation of United Automotive Electronic Systems Co., Ltd., Shanghai, China.

Other notes

23 Statement of cash flows

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

The cash flow is derived indirectly, starting from the profit before tax. Cash inflows from operating activities are adjusted for non-cash expenses and income (mainly depreciation of non-current assets), and take changes in working capital into account.

The investing activities mainly consist of additions to non-current assets, including leased assets and the purchase and disposal of subsidiaries and other operating units, as well as of securities.

Financing activities combine the inflows and outflows of cash and cash equivalents from borrowing and repayment of financial liabilities, from dividends, and from the acquisition of non-controlling interests.

Changes in positions of the statement of financial position contained in the statement of cash flows cannot be directly derived from the statement of financial position, as these have been adjusted for exchange-rate effects and changes in the consolidated group. The change in accounting for pensions is adjusted to eliminate actuarial gains and losses.

The cash and cash equivalents contained in the statement of cash flows contain cash of EUR 3,799 million (previous year: EUR 3,120 million). In the reporting period, there was no transfer restriction for cash and cash equivalents.

Effects of acquisitions on the cash flow are explained in the section on business combinations.

24 Segment reporting

Business sector data

Sales and earnings of continuing operations

T.56

Figures in millions of euros	Automotive Technology		Industrial Technology		Consumer Goods	
	2013	2012	2013	2012	2013	2012
External sales	30,588	28,668	6,844	7,541	3,979	4,045
EBIT	2,359	1,327	–83	368	415	449

Disclosures including discontinued operations

T.57

Figures in millions of euros	Automotive Technology		Industrial Technology		Consumer Goods	
	2013	2012	2013	2012	2013	2012
External sales	30,588	28,668	6,844	7,541	3,979	4,045
Intersegment sales	137	131	180	235	34	27
Total sales	30,725	28,799	7,024	7,776	4,013	4,072
EBIT	2,359	1,327	–83	368	415	449
of which: profit from entities consolidated using the equity method	8	165			154	234
Non-cash expenses (without depreciation)	2,186	1,841	381	352	235	165
Amortization and depreciation	1,657	1,724	282	287	137	167
Impairment losses on intangible assets and property, plant, and equipment	81	21	116		16	11
Non-cash income	556	491	93	106	35	46
Assets	9,400	8,603	2,828	2,923	1,542	1,686
Investments measured at equity	424	542			1,245	1,286

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

The Automotive Technology business sector mainly consists of injection technology for internal-combustion engines, alternative powertrain concepts, efficient and networked powertrain peripherals, systems for active and passive driving safety, assistance and comfort functions, technology for user-friendly infotainment as well as car-to-car and Car2X communication, and concepts, technology, and service for the automotive aftermarket.

The Industrial Technology business sector combines the following activities:

- Automation technology (hydraulics, pneumatics, all important technologies for drives, controls, and motion); pneumatics was sold as of January 1, 2014.
- Packaging technology (machinery and packaging lines for the confectionery, food, beverage, and tobacco industry, as well as for the pharmaceuticals industry).

	Energy and Building Technology		All other segments		Consolidation		Group	
	2013	2012	2013	2012	2013	2012	2013	2012
	4,551	4,382	106	67			46,068	44,703
	106	14	–46	–40			2,751	2,118

	Energy and Building Technology		All other segments		Consolidation		Group	
	2013	2012	2013	2012	2013	2012	2013	2012
	4,857	4,858	106	67			46,374	45,179
	21				–372	–393		
	4,878	4,858	106	67	–372	–393	46,374	45,179
	–1,167	–976	–46	–40			1,478	1,128
							162	399
	1,118	259	9	6			3,929	2,623
	140	268	16	13			2,232	2,459
	83	561	33	21			329	614
	64	34	15	2			763	679
	1,913	1,944	58	18			15,741	15,174
							1,669	1,828

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

- Power tools (tools for the trade, industry, and DIY, accessories, garden tools, as well as industrial tools and measuring equipment),
- Household appliances (appliances for cooking, washing-up, washing, drying, cooling, freezing, floor care, etc.). These business activities are included in the consolidated financial statements using the equity method.

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

- Heating systems (heating and hot-water boilers including open- and closed-loop control systems),
- Security systems (video surveillance, public address systems, evacuation systems, and access control),
- Photovoltaics (solar cells and photovoltaic modules). The crystalline photovoltaics business is reported under discontinued operations in the consolidated financial statements.

Business segments which are not reportable are combined and presented in the category "All other segments." This mainly relates to financial and holding companies as well as other service companies. Positions that belong to financing activities are not included in the segment reporting.

Operating value contribution is the main controlling parameter of our value-based management. In addition to this earnings ratio, the internal reporting to management also reports EBIT at segment level. EBIT is earnings before taxes and before financial result.

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

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

The main items included in non-cash income are income from the reversal of provisions as well as gains on the disposal of items of property, plant, and equipment and of intangible assets.

Segment assets comprise trade receivables as well as inventories, in both cases before valuation allowances.

Reconciliation statements

T.58

Figures in millions of euros	2013	2012
Sales		
Sales by reportable segment	46,640	45,505
Sales of all other segments	106	67
Consolidation	–372	–393
	46,374	**45,179**
Discontinued operations	306	476
Group sales	**46,068**	**44,703**
EBIT		
EBIT by reportable segment	1,524	1,168
EBIT of all other segments	–46	–40
Financial income	1,535	2,830
Financial expenses	–1,466	–1,321
	1,547	**2,637**
Discontinued operations	–1,280	–1,004
Profit before tax	**2,827**	**3,641**
Assets		
Assets by reportable segment	15,683	15,156
Assets of all other segments	58	18
Impairment losses on segment assets	–1,344	–1,303
Other current assets	6,603	6,091
Non-current assets	34,725	32,649
	55,725	**52,611**
Assets held for sale	0	
Group assets	**55,725**	**52,611**

Disclosures by important country

T.59

Figures in millions of euros	Sales by registered office of the customer		Non-current assets[1]	
	2013	2012	2013	2012
Europe	**25,766**	**25,325**	**13,180**	**13,282**
of which Germany	10,720	10,677	8,481	8,403
of which France	2,350	2,386	233	260
of which the U.K.	2,151	2,031	209	244
of which Italy	1,765	1,762	494	492
Americas	**9,498**	**9,312**	**2,183**	**2,337**
of which the U.S.	6,715	6,415	1,726	1,783
Asia	**10,414**	**9,715**	**4,012**	**3,041**
of which China	5,009	3,589	2,536	1,475
of which Japan	1,956	2,477	493	671
Other regions	**696**	**827**	**47**	**68**
	46,374	**45,179**	**19,422**	**18,728**
Discontinued operations	306	476	0	
Group	**46,068**	**44,703**	**19,422**	**18,728**

[1] The non-current assets consist of intangible assets and property, plant, and equipment

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

25 Additional disclosures on financial instruments

Net profit/loss by category

The table below presents the net effects of financial instruments recognized in the income statement, classified by the categories defined in IAS 39:

T.60

Figures in millions of euros	2013	2012
Loans and receivables	–299	–70
Available-for-sale financial assets	410	1,662
Assets and liabilities held for trading	34	168
Financial liabilities measured at amortized cost	–266	–99

The net profit/loss contains the result of the receivables and loan valuation, the result of the reversal of the reserve from securities in equity, exchange-rate gains and losses, interest income and expenses, as well as the result from derivatives.

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

Book values, carrying amounts, and fair values by category

T.61

Figures in millions of euros	Category pursuant to IAS 39	Carrying amount 2013	Carrying amount pursuant to IAS 39			Carrying amount pursuant to IAS 17	Fair value 2013
			(Amortized) cost	Fair value recognized in other comprehensive income	Fair value recognized in profit or loss		
Assets							
Cash and cash equivalents	LaR	3,799	3,799				3,799
Current securities		593					
Available-for-sale financial assets	AfS	593		593			593
Trade receivables	LaR	7,878	7,878				7,878
Other current assets		1,921					
Receivables from finance leases	n.a.	30				30	30
Other financial assets	LaR	802	802				802
Derivative financial assets	FAHfT	50			50		50
Non-financial assets within the meaning of IFRS 7	n.a.	1,039					
Non-current financial assets		10,461					
Available-for-sale financial assets	AfS	8,631		8,631			8,631
Investments	AfS	1,278	687	591			591
Derivative financial assets	FAHfT	23			23		23
Receivables from finance leases	n.a.	143				143	143
Other financial assets	LaR	311	311				312
Non-financial assets within the meaning of IFRS 7	n.a.	75					
Equity and liabilities							
Trade payables	FLAC	3,235	3,235				3,235
Current financial liabilities		538					
Promissory loans	FLAC	346	346				346
Liabilities to banks	FLAC	177	177				177
Other financial liabilities	FLAC	15	15				15
Current other liabilities		4,305					
Derivative financial liabilities	FLHfT	55			55		55
Finance lease obligations	n.a.	5				5	5
Sundry financial liabilities	FLAC	846	846				846
Other non-financial liabilities within the meaning of IFRS 7	n.a.	3,399					
Non-current financial liabilities		4,003					
Bonds	FLAC	3,233	3,233				3,394
Promissory loans	FLAC	154	154				186
Liabilities to banks	FLAC	613	613				634
Other financial liabilities	FLAC	3	3				3
Other non-current liabilities		186					
Derivative financial liabilities	FLHfT	33			33		33
Finance lease obligations	n.a.	11				11	11
Sundry financial liabilities	FLAC	76	76				79
Other non-financial liabilities within the meaning of IFRS 7	n.a.	66					

LaR Loans and receivables
AfS Available-for-sale financial assets
FAHfT Financial assets held for trading
FLAC Financial liabilities measured at amortized cost
FLHfT Financial liabilities held for trading
n.a. not applicable

Figures in millions of euros	Category pursuant to IAS 39	Carrying amount 2012	Carrying amount pursuant to IAS 39			Carrying amount pursuant to IAS 17	Fair value 2012
			(Amortized) cost	Fair value recognized in other comprehensive income	Fair value recognized in profit or loss		
Assets							
Cash and cash equivalents	LaR	3,120	3,120				3,120
Current securities		734					
Available-for-sale financial assets	AfS	734		734			734
Trade receivables	LaR	7,549	7,549				7,549
Other current assets		1,957					
Receivables from finance leases	n.a.	28				28	28
Other financial assets	LaR	881	881				881
Derivative financial assets	FAHfT	53			53		53
Non-financial assets within the meaning of IFRS 7	n.a.	995					
Non-current financial assets		9,363					
Available-for-sale financial assets	AfS	7,552		7,552			7,552
Investments	AfS	1,160	719	441			441
Derivative financial assets	FAHfT	72			72		72
Receivables from finance leases	n.a.	139				139	139
Other financial assets	LaR	311	311				312
Non-financial assets within the meaning of IFRS 7	n.a.	129					
Equity and liabilities							
Trade payables	FLAC	3,135	3,135				3,135
Current financial liabilities		1,264					
Bonds	FLAC	700	700				700
Liabilities to banks	FLAC	563	563				563
Other financial liabilities	FLAC	1	1				1
Current other liabilities		3,843					
Derivative financial liabilities	FLHfT	43			43		43
Finance lease obligations	n.a.	8				8	8
Sundry financial liabilities	FLAC	712	712				712
Other non-financial liabilities within the meaning of IFRS 7	n.a.	3,080					
Non-current financial liabilities		2,806					
Bonds	FLAC	1,744	1,744				2,042
Promissory loans	FLAC	500	500				554
Liabilities to banks	FLAC	553	553				593
Other financial liabilities	FLAC	9	9				10
Other non-current liabilities		218					
Derivative financial liabilities	FLHfT	25			25		25
Finance lease obligations	n.a.	16				16	16
Sundry financial liabilities	FLAC	113	113				117
Other non-financial liabilities within the meaning of IFRS 7	n.a.	64					

The carrying amounts of the financial assets and liabilities, classified by the categories defined in IAS 39, are as follows:

T.62

Figures in millions of euros	2013	2012
Loans and receivables	12,790	11,861
Available-for-sale financial assets	10,502	9,446
Financial assets held for trading	73	125
Financial liabilities measured at amortized cost	8,698	8,030
Financial liabilities held for trading	88	68

Composition of the derivative financial instruments

T.63

Figures in millions of euros	Market values				Nominal values	
	2013 up to 1 year	2013 more than 1 year	2012 up to 1 year	2012 more than 1 year	2013	2012
Derivatives with a positive market value						
Interest derivatives	**0**	**0**	**0**	**2**	**133**	**533**
of which interest swaps		0		2	114	530
of which other interest derivatives	0		0		19	3
Foreign currency derivatives	**45**	**2**	**46**	**4**	**2,686**	**1,688**
Other derivatives	**5**	**21**	**7**	**66**	**56**	**157**
Derivatives with a negative market value						
Interest derivatives	**1**	**1**	**0**	**8**	**296**	**245**
of which interest swaps	1	1		8	227	228
of which other interest derivatives	0	0	0		69	17
Foreign currency derivatives	**37**	**19**	**39**	**0**	**2,662**	**1,693**
Other derivatives	**17**	**13**	**4**	**17**	**206**	**137**

The foreign currency derivatives are mainly forward exchange contracts.

The fair values of the financial assets and financial liabilities in accordance with IFRS 13 are derived as follows:

T.64

Figures in millions of euros	Category pursuant to IAS 39	Level 1 [1]		Level 2 [2]		Total	
		2013	2012	2013	2012	2013	2012
Financial assets							
Investments	AfS	591	421		20	591	441
Derivative financial instruments	FAHfT	1	19	72	106	73	125
of which current		1	19	49	34	50	53
of which non-current				23	72	23	72
Available-for-sale financial assets	AfS	3,231	2,916	5,993	5,370	9,224	8,286
of which current		105	66	488	668	593	734
of which non-current		3,126	2,850	5,505	4,702	8,631	7,552
Other financial assets	LaR			312	312	312	312
Financial liabilities							
Derivative financial instruments	FLHfT	4	19	84	49	88	68
of which current		4	19	51	24	55	43
of which non-current				33	25	33	25
Bonds	FLAC			3,394	2,042	3,394	2,042
Promissory loans	FLAC			186	554	186	554
Liabilities to banks	FLAC			634	593	634	593
Other financial liabilities	FLAC			3	10	3	10
Sundry financial liabilities	FLAC			79	117	79	117

[1] Fair value is calculated on the basis of listed, unadjusted market prices on active markets
[2] Fair value is determined on the basis of market data such as share prices, exchange rates, or interest curves using market-based valuation techniques (e.g. discounted cash flow method or Black-Scholes model)

26 Capital and risk management

Capital management

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

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

Hedging policy and financial derivatives
The operative business of the Bosch Group is impacted in particular by fluctuations in exchange and interest rates. Business policy aims to limit these risks by means of hedging. All hedging transactions are implemented at corporate level.

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

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

Within the corporate finance department, there is a spatial and functional segregation of trading, settlement, and control functions. Key tasks of the control function include determining risks using the value-at-risk method as well as the basis-point-value method, and ongoing compliance checks with instructions and guidelines.

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

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

The largest net currency position of the planned currency cash flow is in USD.

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

The risk of the entire operative foreign-currency position is determined using the value-at-risk concept, supplemented by worst-case analyses. These risk analyses and the hedge result are determined monthly and presented to management.

To present the currency risks in accordance with IFRS 7 for the most important foreign currencies, all monetary assets and monetary liabilities denominated in foreign currency for all consolidated companies were analyzed at the end of the reporting period and sensitivity analyses carried out for the respective currency pairs, in terms of the net risk.

A change in the euro of 10 percent (starting from the closing rate) against the foreign currencies listed in the table would have the following implications for the profit before tax:

T.65

Figures in millions of euros	10% increase in EUR		10% decrease in EUR	
	2013	2012	2013	2012
CHF	13	13	–10	–10
CNY	–25	0	25	–2
CZK	–35	–28	39	30
GBP	0	–11	–3	10
HUF	–16	–17	13	19
JPY	7	7	–10	–10
PLN	–9	–9	9	9
RUB	–9	–8	5	6
TRY	–65	–56	65	57
USD	–146	–250	146	242

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

T.66

Figures in millions of euros	10% increase in USD		10% decrease in USD	
	2013	2012	2013	2012
CNY	–60	–46	60	46

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

Interest-rate risks

Risks from anticipated changes in interest rates on investments and borrowings are limited by select use of derivative financial instruments. These are mainly interest swaps, interest futures, and to a lesser extent also interest options. As of the reporting date, only payer swaps have been used to swap the floating interest expense for promissory note tranches for a fixed rate of interest.

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

A change in the market interest rate by 100 basis points (starting from interest rate on the cut-off date) would have the following effect on the reserve from securities in equity and the profit before tax:

T.67

Figures in millions of euros	Increase in market interest level by 100 basis points		Decrease in market interest level by 100 basis points	
	2013	2012	2013	2012
Reserve from securities	–196	–183	196	183
Profit before tax	30	19	–30	–19

Share-price risks
Derivatives are used on a small scale to limit the risks from investments in shares.

The analysis of the share-price risk in accordance with IFRS 7 took into account share portfolios in the "available-for-sale financial assets" category, investments measured at fair value, as well as share derivatives with a total carrying amount of EUR 3,115 million (previous year: EUR 2,507 million).

A change in the share price of 10 percent (starting from share price on the cut-off date) would have the following effect on the reserve from securities in equity and the profit before tax:

T.68

Figures in millions of euros	10% increase in share price		10% decrease in share price	
	2013	2012	2013	2012
Reserve from securities	313	252	–301	–241
Profit before tax	2	2	–14	–13

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

A change in the forward rate level of 10 percent (starting from forward rate on the reporting date) would have the following effect on the profit before tax:

T.69

Figures in millions of euros	10% increase in forward rates		10% decrease in forward rates	
	2013	2012	2013	2012
Profit before tax	19	20	–19	–20

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

Credit risks

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

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

The credit risk for trade receivables is reduced by processing invoices with the corresponding credit notes in a single work step. Moreover, trade receivables are partly secured by retention of title. For some trade receivables, collateral has been additionally provided in the form of guarantees, property liens, and mortgages.

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

T.70

Figures in millions of euros	2013
Trade receivables (gross value)	8,086
Offsetting of credit notes	208
Trade receivables (carrying amount)	7,878
Financial guarantee contracts (received)	187
Remaining credit risk	**7,691**

The change in valuation allowances for specific risks as well as for the general credit risk is presented in the following table:

T.71

Figures in millions of euros	Trade receivables	Loan receivables
At 1/1/2012	**446**	**5**
Change in the valuation allowance for specific risks	5	–1
Change in the valuation allowance for the general credit risk	2	1
At 12/31/2012	**453**	**5**
Change in the valuation allowance for specific risks	13	1
Change in the valuation allowance for the general credit risk	6	
At 12/31/2013	**472**	**6**

In the fiscal year 2013, valuation allowances were for the first time recognized on a small scale on receivables from finance leases.

There is no indication at the end of the reporting period of any significant defaults of trade receivables or of other financial assets exposed to credit risks that are neither impaired nor past due.

The table below shows a maturity analysis of the unimpaired trade receivables:

T.72

Figures in millions of euros	2013	2012
Trade receivables	7,878	7,549
of which not impaired and not past due at the end of the reporting period	342	570
of which not impaired and past due at the end of the reporting period	44	124
for less than one month	34	103
for more than one month, but less than three months	9	14
for more than three months	1	7

Of the loan receivables and receivables from finance leases (both current and non-current), an amount of EUR 272 million (previous year: EUR 472 million) is not impaired and not past due. There are no loan receivables and receivables from finance leases (both current and non-current) which are not impaired but past due.

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

The table below shows the remaining credit risk from derivative financial instruments in the event that the contractual party defaults:

T.73

Figures in millions of euros	2013
Derivatives with a positive market value (carrying amount)	73
Value of derivatives not netted in the statement of financial position	20
Remaining credit risk	**53**

Liquidity risks

The development of financial assets and liabilities is monitored on an ongoing basis. Internal directives regulate the duties and responsibilities of liquidity management and planning. The company has liquidity reserves in the form of highly liquid assets totaling EUR 4,392 million (previous year: EUR 3,854 million). In addition to that, there is a Euro commercial paper program with a volume of EUR 1,000 million and a US commercial paper program with a volume of USD 2,000 million, neither of which had been drawn at the end of the reporting period. There is also a medium-term-note program with a volume of EUR 7,500 million, of which EUR 3,250 million has been drawn.

The liquidity risk is reduced by processing invoices for trade payables with the corresponding credit notes received in a single work step. Moreover, collateral is provided in the form of guarantees.

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

T.74

Figures in millions of euros	2013
Trade payables (gross value)	3,304
Offsetting of credit notes received	69
Trade payables (carrying amount)	3,235
Financial guarantee contracts (granted)	228
Remaining liquidity risk	**3,007**

The liquidity risk for derivatives that do not currently satisfy the set-off criteria of IAS 32, as offsetting can only be enforced in the case of insolvency, is presented in the following table:

T.75

Figures in millions of euros	2013
Derivatives with a negative market value (carrying amount)	88
Value of derivatives not netted in the statement of financial position	20
Remaining liquidity risk	**68**

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

T.76

Figures in millions of euros	Carrying amount	Undiscounted cash flows					
	2013	2014	2015	2016	2017	2018	2019 ff.
Non-derivative financial liabilities							
Trade payables	3,235	3,235					
Bonds	3,233	115	115	845	765	50	2,121
Promissory loans	500	357	9	9	9	9	157
Liabilities to banks	790	193	17	76	256	304	0
Other financial liabilities	18	16	1	1	1	0	0
Sundry financial liabilities	922	852	55	17	3	1	3
Finance lease obligations	16	7	3	3	2	2	8
Derivative financial liabilities							
Gross settlement	59						
Cash outflows		2,537	212	26	1	1	2
Cash inflows		2,499	169	24	0	0	1
Net settlement	29						
Cash outflows		25	4	0	0	0	0

Figures in millions of euros	Carrying amount	Undiscounted cash flows					
	2012	2013	2014	2015	2016	2017	2018 ff.
Non-derivative financial liabilities							
Trade payables	3,135	3,135					
Bonds	2,444	790	80	80	810	730	331
Promissory loans	500	21	358	9	9	9	166
Liabilities to banks	1,116	598	14	13	12	262	304
Other financial liabilities	10	1	9	1	1	1	1
Sundry financial liabilities	825	724	85	11	8	2	7
Finance lease obligations	24	11	6	4	2	3	10
Derivative financial liabilities							
Gross settlement	60						
Cash outflows		1,687	19	1	34	1	1
Cash inflows		1,653	11	0	18	0	1
Net settlement	8						
Cash outflows		9	0	0	0	0	0

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

27 Related parties disclosures

As shareholder, Robert Bosch Industrietreuhand KG exercises majority voting rights at Robert Bosch GmbH. In addition, Robert Bosch Industrietreuhand KG is accountable for the internal audit of the Bosch Group. The costs incurred for this of EUR 12 million (previous year: EUR 12 million) were borne by Robert Bosch GmbH.

A part of the pension obligations and funds has been outsourced to Bosch Pensionsfonds AG. Robert Bosch GmbH is the sole shareholder of Bosch Pensionsfonds AG. Bosch Hilfe e.V. provides assistance to associates of co-owners in emergencies (emergency assistance). Bosch Hilfe e.V. is co-owned by Robert Bosch GmbH, Stuttgart, Germany, Robert Bosch Car Multimedia Holding GmbH, Hildesheim, Germany, and Robert Bosch Elektronik GmbH, Salzgitter, Germany. A part of the asset portfolio of Bosch Hilfe e.V. consists of its ownership in Robert Bosch Wohnungsgesellschaft mbH, Stuttgart, Germany, which builds and rents property for Bosch associates.

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

Sales, receivables, and liabilities due from and to related companies

T.77

Figures in millions of euros	Sales		Receivables		Liabilities	
	2013	2012	2013	2012	2013	2012
sia Abrasives Company Ltd., China		3		1		
Weifu High Technology Co., Ltd., China	5	4	3		6	5
EM-motive GmbH, Germany		13		8		3
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH, Germany	44	47	9	7		
SupplyOn AG, Germany					2	
Oleodinamica Gambini S.r.l., Italy	3	2	1	1		
MHB Filter India Private Ltd., India						11
Johnson Controls Autobatterie GmbH & Co. KGaA, Germany	5	5		1		
Akebono Brake Industry Co., Ltd., Japan					1	2
Knorr-Bremse Commercial Vehicle Systems Japan Ltd., Japan						1
Doowon Precision Industry Co., Ltd., Korea		3		1		
Loos Centrum Sp.z o.o., Poland	3	2		1		
Rotzinger AG, Switzerland			3	2	2	1
Associated Fuel Pump Systems Corporation, USA		2		1		
North America Fuel Systems Remanufacturing LLC, USA	3	7		1		

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

Total remuneration of management in key positions

The group's key management personnel are the general partners of Robert Bosch Industrietreuhand KG, the members of the supervisory board, and the members of the board of management of Robert Bosch GmbH.

The total remuneration of members of management in key positions totals EUR 30 million in the fiscal year 2013 (previous year: EUR 30 million) and breaks down as follows:

T.78

Figures in millions of euros	2013	2012
Short-term benefits	18	18
Post-employment benefits	10	11
Other long-term benefits	2	1

Share-based payments are not made.

There are no provisions (valuation allowances) for doubtful debts due from key management personnel. Moreover, no expenses were incurred for uncollectible or doubtful receivables.

The Bosch Group pays other related parties compensation totaling EUR 0.5 million (previous year: EUR 0.3 million) for various services, mainly consulting services. At the end of the fiscal year there were neither receivables nor liabilities from these business transactions. Guarantees have neither been given nor received.

28 Additional disclosures pursuant to Sec. 315a HGB

Declaration of compliance with the German Corporate Governance Code
The declaration of compliance required by Sec. 161 AktG ["Aktiengesetz"; German Stock Corporations Act] for the listed company aleo solar AG, Prenzlau, Germany, which was included in the consolidated financial statements of the Bosch Group for the first time in the fiscal year 2009, was issued by the board of management and supervisory board of aleo solar AG, and is publicly accessible on the internet site of aleo solar AG.

Remuneration of members of the board of management and supervisory council
The total remuneration of the members of the board of management (including provisions) comes to EUR 16 million in the fiscal year 2013 (previous year: EUR 15 million), and that of the former members of the board of management and their dependants to EUR 20 million (previous year: EUR 22 million). The remuneration of the members of the supervisory board comes to approximately EUR 2 million. An amount of EUR 165 million (previous year: EUR 123 million) has been accrued at Robert Bosch GmbH for pension obligations to former members of the board of management and their surviving dependants. The increase in pension obligations to former members of management and their dependants is mainly due to the retirement of several members of the board of management in the past fiscal year.

Headcount

T.79

	Annual average 2013	Annual average 2012
EU countries	160,557	161,885
Rest of Europe	14,091	13,704
Americas	32,988	32,231
Asia, Africa, Australia	72,103	65,271
	279,739	**273,091**

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

T.80

Figures in millions of euros	2013	2012
Fees for		
Audit services	4.1	4.0
Audit-related services	0.1	0.1
Tax advisory services	1.5	1.5
Other services	2.3	3.2

List of shareholdings of the Bosch Group as of December 2013

1 Consolidated group

T.81

	Company name	Registered office	Percentage share of capital held
Germany	Robert Bosch GmbH	Stuttgart	
	aleo solar AG	Prenzlau	90.7
	aleo solar Deutschland GmbH	Oldenburg	100.0
	aleo solar Dritte Produktion GmbH	Prenzlau	100.0
	Ampack GmbH	Königsbrunn	100.0
	Beissbarth GmbH	Munich	100.0[1,2]
	Bosch Access Systems GmbH	Würselen	100.0[1]
	Bosch Automotive Service Solutions GmbH	Pollenfeld	100.0[1]
	Bosch Communication Center Magdeburg GmbH	Magdeburg	100.0[1]
	Bosch Emission Systems GmbH & Co. KG	Stuttgart	100.0[3]
	Bosch Engineering GmbH	Abstatt	100.0[1]
	Bosch Engineering Holding GmbH	Abstatt	100.0[1, 2]
	Bosch Industriekessel GmbH	Gunzenhausen	100.0[1]
	Bosch Inspection Technology GmbH	Cologne	100.0[1]
	Bosch KWK Systeme GmbH	Lollar	100.0[1]
	Bosch Packaging Systems GmbH	Remshalden	100.0[1]
	Bosch Pensionsgesellschaft mbH	Stuttgart	100.0[1]
	Bosch Power Tec GmbH	Hamburg	100.0
	Bosch Rexroth AG	Stuttgart	100.0[1, 2]
	Bosch Rexroth Pneumatics GmbH	Laatzen	100.0[1]
	Bosch Sensortec GmbH	Kusterdingen	100.0[1]
	Bosch Sicherheitssysteme Engineering GmbH	Nuremberg	100.0[1]
	Bosch Sicherheitssysteme GmbH	Stuttgart	100.0[1, 2]
	Bosch Sicherheitssysteme Montage und Service GmbH	Weimar	100.0[1]
	Bosch Silicon Trading GmbH	Erfurt	100.0
	Bosch Software Innovations GmbH	Berlin	100.0[1]
	Bosch Solar CISTech GmbH	Brandenburg/Havel	100.0[1]
	Bosch Solar Energy AG	Erfurt	100.0[1, 2]
	Bosch Solar Operations GmbH	Erfurt	100.0[1]
	Bosch Solar Thin Film GmbH	Erfurt	100.0[1]
	Bosch Solarthermie GmbH	Wettringen	100.0[1]
	Bosch Telecom Holding GmbH	Stuttgart	100.0[1, 2]
	Bosch Thermotechnik GmbH	Wetzlar	100.0[1, 2]
	Buderus Guss GmbH	Breidenbach	100.0[1]
	Buderus Immobilien GmbH	Wetzlar	96.0[1]
	Elektra-Versicherungsvermittlungs-GmbH	Frankfurt	100.0[1]
	ETAS GmbH	Stuttgart	100.0[1, 2]
	EVI Audio GmbH	Straubing	100.0[1]

	Company name	Registered office	Percentage share of capital held
	Hawera Probst GmbH	Ravensburg	100.0[1]
	Holger Christiansen Deutschland GmbH	Wilnsdorf	100.0[1]
	Hüttlin GmbH	Schopfheim	100.0[1]
	Ingenieurbüro Ammann GmbH	Königsbrunn	100.0
	Landau Electronic GmbH	Mörfelden-Walldorf	100.0[1]
	Matra-Werke GmbH	Hainburg	100.0[1]
	Moehwald GmbH	Homburg/Saar	100.0[1]
	Pharmatec GmbH	Dresden	100.0[1]
	Robert Bosch Battery Systems GmbH	Stuttgart	100.0[1]
	Robert Bosch Car Multimedia GmbH	Hildesheim	100.0[1]
	Robert Bosch Car Multimedia Holding GmbH	Hildesheim	100.0[1, 2]
	Robert Bosch Elektronik GmbH	Salzgitter	100.0[1]
	Robert Bosch Elektrowerkzeuge GmbH	Sebnitz	100.0[1]
	Robert Bosch Erste Vermögensverwaltungsgesellschaft mbH	Stuttgart	100.0[1, 2]
	Robert Bosch Fahrzeugelektrik Eisenach GmbH	Eisenach	100.0[1]
	Robert Bosch Fünfte Vermögensverwaltungsgesellschaft mbH	Gerlingen	100.0[1]
	Robert Bosch Healthcare GmbH	Waiblingen	100.0[1]
	Robert Bosch Lizenzverwaltungsgesellschaft mbH	Holzkirchen	100.0
	Robert Bosch Venture Capital GmbH	Gerlingen	100.0[1]
	Robert Bosch Versicherungsvermittlungs-GmbH	Stuttgart	100.0[1]
	Robert Bosch Vierte Vermögensverwaltungsgesellschaft mbH	Gerlingen	100.0[1]
	Robert Bosch Zweite Vermögensverwaltungsgesellschaft mbH	Stuttgart	100.0[1]
	sia Abrasives Deutschland GmbH	Solingen	100.0
	Sieger Heizsysteme GmbH	Siegen	100.0[1]
	UC Vermögensverwaltung GmbH	Stuttgart	100.0[1]

[1] These companies make use of the exemption provided for in Sec. 264 (3) HGB.
[2] These companies make use of the exemption provided for in Sec. 291 (2) HGB.
[3] The company makes use of the exemption provided for in Sec. 264b HGB.

	Company name	Registered office	Percentage share of capital held
Europe			
Austria	Bosch Industriekessel Austria GmbH	Bischofshofen	100.0
	Bosch Rexroth GmbH	Pasching	100.0
	Bosch Rexroth Pneumatics GmbH	Pasching	100.0
	Robert Bosch AG	Vienna	100.0
	Robert Bosch Holding Austria GmbH	Vienna	100.0
	SBM Schoeller-Bleckmann-Medizintechnik GmbH	Ternitz	100.0
Belgium	Bosch Rexroth N.V.	Brussels	100.0
	Bosch Thermotechnology N.V. / S.A.	Leuven-Heverlee	100.0
	Robert Bosch Produktie N.V.	Tienen	100.0
	Robert Bosch S.A.	Anderlecht (Brussels)	100.0
	sia Abrasives Belgium N.V. / S.A.	Mollem	100.0
Czech Republic	Bosch Diesel s.r.o.	Jihlava	100.0
	Bosch Rexroth Pneumatics spol. s.r.o.	Brno	100.0
	Bosch Rexroth spol. s.r.o.	Brno	100.0
	Bosch Thermotechnika s.r.o.	Krnov	100.0
	Robert Bosch odbytova s.r.o.	Prague	100.0
	Robert Bosch, spol. s.r.o.	České Budějovice	100.0
Denmark	Bosch Rexroth A/S	Hvidovre	100.0
	Bosch Rexroth Pneumatics ApS	Hvidovre	100.0
	Holger Christiansen A/S	Esbjerg	100.0
	Robert Bosch A/S	Ballerup	100.0
Finland	Bosch Rexroth Oy	Vantaa	100.0
	Bosch Rexroth Pneumatics Oy	Vantaa	100.0
	Robert Bosch Oy	Espoo	100.0
France	Bosch Automotive Service Solutions S.a.r.l.	La Ferté-Bernard	100.0
	Bosch Centre de Service S.A.S.	Forbach	100.0
	Bosch Packaging Services S.a.r.l.	Hoenheim	100.0
	Bosch Rexroth DSI S.A.S.	Vénissieux	100.0
	Bosch Rexroth Fluidtech S.A.S.	Bonneville	100.0
	Bosch Rexroth S.A.S.	Vénissieux	100.0
	Bosch Security Systems S.A.S. France	Clamart	100.0
	Bosch Thermotechnologie S.A.S.	Saint Thégonnec	100.0
	E.L.M. Leblanc S.A.S.U.	Drancy	100.0
	Holger Christiansen France S.A.S.	Olivet	100.0
	Robert Bosch (France) S.A.S.	Saint-Ouen (Paris)	100.0
	sia Abrasives France S.a.r.l.	Roissy Ch.-de-Gaulle	100.0

	Company name	Registered office	Percentage share of capital held
Greece	Robert Bosch S.A.	Koropi (Athens)	100.0
Hungary	Bosch Rexroth Kft.	Budapest	100.0
	Bosch Rexroth Pneumatika Kft.	Eger	100.0
	Robert Bosch Elektronika Gyártó Kft.	Hatvan	100.0
	Robert Bosch Energy and Body Systems Kft.	Miskolc	100.0
	Robert Bosch Kft.	Budapest	100.0
	Robert Bosch Power Tool Elektromos Szerszám-gyártó Kft.	Miskolc	100.0
Ireland	Robert Bosch Ireland Ltd.	Portlaoise	100.0
Italy	aleo solar distribuzione Italia S.r.l.	Milan	100.0
	aleo solar Italia S.r.l.	Treviso	100.0
	BMA Abrasives S.p.A.	Borgo San Giovanni	100.0
	Bosch Automotive Service Solutions S.r.l.	Parma	100.0
	Bosch Energy and Building Solutions Italy S.r.l.	Cinisello Balsamo	100.0
	Bosch Rexroth Oil Control S.p.A.	Milan	94.5
	Bosch Rexroth Pneumatics S.r.l.	Cernusco	100.0
	Bosch Rexroth S.p.A.	Cernusco	100.0
	Bosch Security Systems S.p.A.	Milan	100.0
	Centro Studi Componenti per Veicoli S.p.A.	Modugno (Bari)	100.0
	Freud Produzioni Industriali S.p.A.	Milan	100.0
	Freud S.p.A.	Brugherio	100.0
	Holger Christiansen Italia S.r.l.	Bologna	100.0
	ROBERT BOSCH S.p.A. Società Unipersonale	Milan	100.0
	SICAM S.r.l.	Correggio	100.0
	Tecnologie Diesel e Sistemi Frenanti S.p.A.	Modugno (Bari)	100.0
	VHIT S.p.A.	Modugno (Bari)	100.0
Luxembourg	Ferroknepper Buderus S.A.	Esch-sur-Alzette	100.0
Malta	Robert Bosch Finance Malta, Ltd.	Valletta	100.0
	Robert Bosch Holding Malta, Ltd.	Valletta	100.0
	Robert Bosch IC Financing Malta Limited	St. Julians	100.0
Netherlands	Bosch Communications Center B.V.	Nimwegen	100.0
	Bosch Packaging Technology B.V.	Schiedam	100.0
	Bosch Rexroth B.V.	Boxtel	100.0
	Bosch Rexroth Pneumatics B.V.	Boxtel	100.0
	Bosch Rexroth Pneumatics Holding B.V.	Boxtel	100.0
	Bosch Security Systems B.V.	Eindhoven	100.0
	Bosch Thermotechniek B.V.	Deventer	100.0

	Company name	Registered office	Percentage share of capital held
	Bosch Thermotechnik Holding B.V.	Boxtel	100.0
	Bosch Transmission Technology B.V.	Tilburg	100.0
	Nefit Vastgoed B.V.	Deventer	100.0
	Robert Bosch B.V.	Boxtel	100.0
	Robert Bosch Holding Nederland B.V.	Boxtel	100.0
	Robert Bosch Investment Nederland B.V.	Boxtel	100.0
	Robert Bosch Licensing Administration C.V.	Boxtel	100.0
	Robert Bosch Packaging Technology B.V.	Weert	100.0
	Skil Europe B.V.	Breda	100.0
	Telex Holding Germany B.V.	Boxtel	100.0
	Telex Holding Hong Kong B.V.	Boxtel	100.0
	Telex Holding Singapore B.V.	Boxtel	100.0
Norway	Bosch Rexroth A/S	Ski	100.0
	Bosch Rexroth Pneumatics A/S	Langhus	100.0
	Robert Bosch A/S	Ski	100.0
Poland	Bosch Rexroth Sp. z o.o.	Pruszkow	100.0
	Bosch Rexroth Pneumatics Polska Sp. z o.o.	Warsaw	100.0
	ROBERT BOSCH Sp. z o.o.	Warsaw	100.0
Portugal	Bosch Car Multimedia Portugal, S.A.	Braga	100.0
	Bosch Security Systems, S.A.	Ovar	100.0
	Bosch Termotechnologia, S.A.	Aveiro	100.0
	Robert Bosch Portugal, SGPS, S.A.	Lisbon	100.0
	Robert Bosch, S.A.	Lisbon	100.0
Romania	Bosch Communication Center S.R.L.	Timişoara	100.0
	Bosch Rexroth S.R.L.	Blaj	100.0
	ROBERT BOSCH S.R.L.	Bucharest	100.0
Russian Federation	OOO “Construction & investments”	Khimki	100.0
	OOO Bosch Power Tools	Engels	100.0
	OOO Bosch Rexroth	Moscow	100.0
	OOO Bosch Thermotechnik	Moscow	100.0
	OOO Robert Bosch	Moscow	100.0
	OOO Robert Bosch Saratow	Engels	100.0
Slovakia	Holger Christiansen Produktion Slovakia s.r.o.	Bernolákovo	100.0
Slovenia	Indramat elektromotorji d.o.o.	Škofja Loka	100.0

	Company name	Registered office	Percentage share of capital held
Spain	aleo solar distribución España S.L.	Barcelona	100.0
	aleo solar España S.L.	Barcelona	100.0
	Bosch Rexroth, S.L.	Barcelona	100.0
	Bosch Security Systems S.A.	Madrid	100.0
	BOSCH SISTEMAS DE FRENADO, S.L.U.	Madrid	100.0
	ROBERT BOSCH ESPAÑA FÁBRICA CASTELLET S.A.	Castellet	100.0
	ROBERT BOSCH ESPAÑA FÁBRICA MADRID S.A.	Madrid	100.0
	ROBERT BOSCH ESPAÑA FÁBRICA TRETO S.A.	Treto	100.0
	Robert Bosch España Gasoline Systems S.A.	Aranjuez	100.0
	ROBERT BOSCH ESPAÑA, S.L.U.	Madrid	100.0
	sia Abrasives Espana S.A.U.	Madrid	100.0
Sweden	Bosch Rexroth Mellansel AB	Mellansel	100.0
	Bosch Rexroth Pneumatics AB	Älvsjö	100.0
	Bosch Rexroth Teknik AB	Stockholm	100.0
	Bosch Thermoteknik AB	Tranås	100.0
	Holger Christiansen Sverige AB	Örebro	100.0
	Robert Bosch AB	Kista	100.0
Switzerland	Bosch Packaging Services AG	Beringen	100.0
	Bosch Packaging Systems AG	Beringen	100.0
	Bosch Packaging Technology SA	Romanel-sur-Lausanne	100.0
	Bosch Pouch Systems AG	Beringen	100.0
	Bosch Rexroth Pneumatics AG	Buttikon	100.0
	Bosch Rexroth Schweiz AG	Buttikon	100.0
	Buderus Heiztechnik AG	Pratteln	100.0
	Robert Bosch AG	Zuchwil	100.0
	Robert Bosch Internationale Beteiligungen AG	Zuchwil	100.0
	Sapal S.A.	Ecublens	100.0
	Scintilla AG	Solothurn	100.0
	sia Abrasives Industries AG	Frauenfeld	100.0
	TeleAlarm S.A.	La Chaux-de-Fonds	100.0
Turkey	Bosch Fren Sistemleri Sanayi ve Ticaret A.S.	Bursa	84.5
	Bosch Rexroth Otomasyon Sanayi ve Ticaret A.S.	Sefaköy-Istanbul	100.0
	Bosch Sanayi ve Ticaret A.S.	Bursa	100.0
	Bosch Termoteknik Sanayi ve Ticaret A.S.	Manisa	100.0
Ukraine	Holger Christiansen Production Ukraine	Krakovets	100.0
United Kingdom	Bosch Automotive Service Solutions Ltd.	Brixworth	100.0
	Bosch Lawn and Garden Ltd.	Stowmarket	100.0

	Company name	Registered office	Percentage share of capital held
	Bosch Packaging Technology Limited	Derby	100.0
	Bosch Rexroth Ltd.	St. Neots	100.0
	Bosch Rexroth Pneumatics Ltd.	Cirencester	100.0
	Bosch Security Systems Ltd.	Denham	100.0
	Bosch Thermotechnology Ltd.	Worcester	100.0
	Hägglunds Drives Limited	Wakefield	100.0
	Holger Christiansen UK Ltd.	Nottingham	100.0
	Robert Bosch Finance Ltd.	Denham	100.0
	Robert Bosch Investment Ltd.	Warndon, Worcester	100.0
	Robert Bosch Ltd.	Denham	100.0
	Robert Bosch UK Holdings Limited	Denham	100.0
	sia Abrafoam Ltd.	Alfreton	100.0
	sia Abrasives (G.B.) Ltd.	Greetland	100.0
	sia Abrasives Holding Ltd.	Greetland	100.0
	sia Fibral Ltd.	Greetland	100.0
	Valley Forge (UK) Limited	Basildon	100.0
	Worcester Group plc	Warndon, Worcester	100.0
Americas			
Argentina	Bosch Rexroth S.A.I.C.	Buenos Aires	100.0
	Robert Bosch Argentina Industrial S.A.	Buenos Aires	100.0
Brazil	Bosch Rexroth Ltda.	Atibaia-SP	100.0
	Robert Bosch Centro de Comunicação Limitada	Campinas	100.0
	Robert Bosch Ltda.	Campinas	100.0
	Robert Bosch Tecnologia de Embalagem Ltda.	Alphaville	100.0
	Bosch Solutions Serviços Automotivos Ltda.	São Paulo	100.0
	sia Abrasivos Industriais Ltda.	Sao José dos Pinhais	100.0
Canada	Bosch Rexroth Canada Corporation	Welland, ON	100.0
	Bosch Rexroth Pneumatics Inc.	Welland, ON	100.0
	Extreme CCTV Inc.	Burnaby	100.0
	Freud Canada Inc.	Mississauga, ON	100.0
	ROBERT BOSCH INC.	Mississauga, ON	100.0
Chile	Robert Bosch S. A.	Santiago de Chile	100.0
Mexico	Bosch Rexroth, S.A. de C.V.	Mexico City	100.0
	Frenados Mexicanos, S.A. de C.V.	Aguascalientes	100.0
	Morse Automotive Corporation - Mexico, S. de R.L. de C.V.	Juarez	100.0
	Robert Bosch Mexico Holding, S.A. de C.V.	Mexico City	100.0
	Robert Bosch México S.A. de C.V.	Mexico City	100.0

	Company name	Registered office	Percentage share of capital held
	Robert Bosch México Sistemas Automotrices, S.A. de C.V.	San Luis Potosi	100.0
	Robert Bosch Sistemas Automotrices, S.A. de C.V.	Juarez	100.0
	Robert Bosch Tool de Mexico, S.A. de C.V.	Mexicali	100.0
	Robert Bosch, S. de R.L. de C.V.	Toluca	100.0
	Saguaro Electronica, S.A. de C.V.	Hermosillo	100.0
United States	aleo solar North America Inc.	Westminster, CO	100.0
	Bosch Automotive Service Solutions Holdings, Inc.	Wilmington, DE	100.0
	Bosch Automotive Service Solutions LLC	Warren, MI	100.0
	Bosch Brake Components LLC	Broadview, IL	100.0
	Bosch Inspection Technology Inc.	Allendale, NJ	100.0
	Bosch Packaging Services Inc.	Raleigh, NC	100.0
	Bosch Packaging Technology, Inc.	New Richmond, WI	100.0
	Bosch PV Projects, LLC	San Mateo, CA	100.0
	Bosch Rexroth Corporation	Lehigh Valley, PA	100.0
	Bosch Rexroth Pneumatics Corporation	Lexington	100.0
	Bosch Security Systems Inc.	Burnsville, MN	100.0
	Bosch Solar Energy Corp.	Detroit, MI	100.0
	Bosch Thermotechnology Corp.	Londonderry, NH	100.0
	BSE PV LLC	Palo Alto, CA	100.0
	BSE PV Maui County II, LLC	San Mateo, CA	100.0
	BSE PV Maui County, LLC	San Mateo, CA	100.0
	Compu-Spread Corporation	Delano, MN	100.0
	ETAS Inc.	Ann Arbor, MI	100.0
	FHP Manufacturing Company	Fort Lauderdale, FL	100.0
	Freud America Inc.	High Point, NC	100.0
	Ovonic Energy Products, Inc.	Orion, MI	100.0
	Robert Bosch Battery Systems LLC	Orion, MI	100.0
	Robert Bosch Finance LLC	Broadview, IL	100.0
	ROBERT BOSCH FUEL SYSTEMS LLC	Kentwood, MI	100.0
	Robert Bosch Healthcare Systems, Inc.	Farmington Hills, MI	100.0
	Robert Bosch LLC	Broadview, IL	100.0
	Robert Bosch North America Corporation	Broadview, IL	100.0
	Robert Bosch Packaging Technology Inc.	Minneapolis, MN	100.0
	Robert Bosch Tool Corporation	Mt. Prospect, IL	100.0
	sia Abrasives, Inc. USA	Charlotte, NC	100.0
	Vetronix Corporation	Santa Barbara, CA	100.0
Venezuela	Inversiones 421,10 (Venezuela Holding)	Caracas	100.0
	Skil Venezolana SRL	Caracas	100.0

	Company name	Registered office	Percentage share of capital held
Asia			
China	AUTOBOSS TECH. INC.	Shenzhen	100.0
	Bosch (Shanghai) Security Systems Ltd.	Shanghai	100.0
	Bosch (Zhuhai) Security Systems Co., Ltd.	Zhuhai	100.0
	Bosch Automotive Diesel Systems Co., Ltd.	Wuxi	66.0
	Bosch Automotive Products (Changsha) Co., Ltd.	Changsha	100.0
	Bosch Automotive Products (Chengdu) Co., Ltd.	Chengdu	100.0
	Bosch Automotive Products (Suzhou) Co., Ltd.	Suzhou	100.0
	Bosch Automotive Service Solutions (Suzhou) Co., Ltd.	Suzhou	100.0
	Bosch China (Investment) Ltd.	Shanghai	100.0
	Bosch Gardening Equipment (Ningbo) Co., Ltd.	Yuyao City	100.0
	Bosch Inspection Technology (Shanghai) Co., Ltd.	Shanghai	100.0
	Bosch Packaging Technology (Chengdu) Co., Ltd.	Chengdu	100.0
	Bosch Packaging Technology (Hangzhou) Co., Ltd.	Hangzhou	100.0
	Bosch Power Tools (China) Ltd.	Hangzhou	100.0
	Bosch Rexroth (Beijing) Hydraulic Co., Ltd.	Beijing	100.0
	Bosch Rexroth (Changzhou) Co., Ltd.	Changzhou	100.0
	Bosch Rexroth (China) Ltd.	Hong Kong	100.0
	Bosch Rexroth (Xi'an) Electric Drives and Controls Co., Ltd.	Xi'an	100.0
	Bosch Rexroth Pneumatics Equipment (Changzhou) Co., Ltd.	Wujin	100.0
	Bosch Rexroth Pneumatics Trading (Shanghai) Co., Ltd.	Shanghai	100.0
	Bosch Security Systems Ltd.	Hong Kong	100.0
	Bosch Thermotechnology (Beijing) Co., Ltd.	Beijing	100.0
	Bosch Trading (Shanghai) Co., Ltd.	Shanghai	100.0
	ETAS Automotive Technology (Shanghai) Co., Ltd.	Shanghai	100.0
	Hägglunds Drives Shanghai Ltd.	Shanghai	100.0
	Robert Bosch Company Ltd.	Hong Kong	100.0
	Shanghai Bosch Rexroth Hydraulics & Automation Ltd.	Shanghai	100.0
	Taixiang Vehicle Replace Parts (Shenzhen) Co., Ltd.	Shenzhen	100.0
	United Automotive Electronic Systems Co., Ltd.	Shanghai	51.0
India	Bosch Automotive Electronics India Private Ltd.	Bangalore	100.0
	Bosch Chassis Systems India Ltd.	Pune	97.9
	Bosch Electrical Drives India Private Ltd.	Chennai	87.7
	Bosch Ltd.	Bangalore	71.2
	Bosch Rexroth (India) Ltd.	Ahmedabad	96.4
	Robert Bosch Engineering and Business Solutions Ltd.	Bangalore	100.0

	Company name	Registered office	Percentage share of capital held
Japan	Bosch Automotive Service Solutions Corporation	Tokyo	100.0
	Bosch Corporation	Tokyo	100.0
	Bosch Packaging Services K.K.	Chiba	100.0
	Bosch Packaging Technology K.K.	Tokyo	100.0
	Bosch Rexroth Corporation	Tsuchiura-shi	99.9
	Daito Hydraulics Co., Ltd.	Nasu-gun	100.0
	ETAS K.K.	Yokohama	100.0
	EVI Audio (Japan) Ltd.	Tokyo	100.0
	FA Niigata Co., Ltd.	Niigata	100.0
	Fuji Aitac Co., Ltd.	Gunma	100.0
	Gunma Seiki Co., Ltd.	Gunma	100.0
	Nippon Injector Corporation	Odawara	50.0
Korea	Bosch Electrical Drives Co., Ltd.	Buyong	100.0
	Bosch Rexroth Korea Ltd.	Busan	100.0
	Bosch Rexroth Pneumatics Korea Ltd.	Busan	100.0
	Robert Bosch Korea Diesel Ltd.	Daejeon	100.0
	Robert Bosch Korea Ltd.	Daejeon	100.0
Malaysia	Bosch Power Tools Engineering Sdn. Bhd.	Penang	100.0
	Bosch Rexroth Sdn. Bhd.	Shah Alam	100.0
	Bosch Solar Energy Malaysia Sdn. Bhd.	Penang	100.0
	ROBERT BOSCH (MALAYSIA) SDN. BHD.	Penang	100.0
	ROBERT BOSCH POWER TOOLS SDN. BHD.	Penang	100.0
	Robert Bosch Sdn. Bhd.	Kuala Lumpur	100.0
Singapore	BOSCH PACKAGING TECHNOLOGY (SINGAPORE) PTE. LTD.	Singapore	100.0
	Bosch Rexroth Pte. Ltd.	Singapore	100.0
	Robert Bosch (South East Asia) Pte. Ltd.	Singapore	100.0
	Robert Bosch Security Solutions Pte.	Singapore	100.0
Taiwan	Bosch Rexroth Co., Ltd.	Taipei	100.0
	Robert Bosch Taiwan Co., Ltd.	Taipei	100.0
	Unipoint Electric MFG Co., Ltd.	Taipei	100.0
Thailand	Bosch Automotive Thailand Co., Ltd.	Rayong	87.9
	Robert Bosch Ltd.	Bangkok	100.0
United Arab Emirates	Robert Bosch Middle East FZE	Dubai	100.0
Vietnam	Robert Bosch Vietnam Co., Ltd.	Ho Chi Minh City	100.0

	Company name	Registered office	Percentage share of capital held
Rest of World			
Australia	Abrasives Products Pty. Ltd.	Rowville	100.0
	aleo solar Australia Pty. Ltd.	Thornbury	100.0
	Australian Industrial Abrasives Pty. Ltd.	Rowville	100.0
	Bosch Automotive Service Solutions Pty. Ltd.	Melbourne	100.0
	Bosch Rexroth Pty. Ltd.	Kings Park	100.0
	Bosch Security Systems Pty. Ltd.	Sydney	100.0
	Robert Bosch (Australia) Pty. Ltd.	Clayton	100.0
	sia Abrasives Australasia Holding Pty. Ltd.	Rowville	100.0
	sia Abrasives Australia Pty. Ltd.	Rowville	100.0
New Zealand	AIA Abrasives Ltd.	Christchurch	100.0
	Bosch Security Systems Ltd.	Auckland	100.0
South Africa	Robert Bosch (Pty.) Ltd.	Brits	100.0

2 Investments accounted for using the equity method

	Company name	Registered office	Percentage share of capital
Germany	Bosch Mahle Turbo Systems GmbH & Co. KG	Stuttgart	50.0
	BSH Bosch und Siemens Hausgeräte GmbH	Munich	50.0
	EM-motive GmbH	Hildesheim	50.0
	ZF Lenksysteme GmbH	Schwäbisch Gmünd	50.0
United States	Associated Fuel Pump Systems Corporation	Anderson, SC	50.0

3 Investments measured at cost or fair value

	Company name	Registered office	Percentage share of capital held
Germany	AIG Planungs- und Ingenieurgesellschaft mbH	Stuttgart	100.0
	Alltrucks GmbH & Co. KG	Munich	33.3
	Asanetwork GmbH	Willstätt	23.3
	Bosch Connected Devices and Solutions GmbH	Reutlingen	100.0
	Bosch Emission Systems Verwaltungs-GmbH	Stuttgart	100.0

	Company name	Registered office	Percentage share of capital held
	Bosch Energy and Building Solutions GmbH	Ditzingen	100.0
	Bosch Global Travel Management GmbH	Stuttgart	100.0
	Bosch Mahle Turbo Systems Verwaltungs GmbH	Stuttgart	50.0
	Bosch Management Support GmbH	Leonberg	100.0
	Bosch Pensionsfonds AG	Stuttgart	100.0
	Bosch Rexroth Interlit GmbH	Joachimsthal	100.0
	Bosch Rexroth Monitoring Systems GmbH	Dresden	100.0
	Bosch SoftTec GmbH	Hildesheim	100.0
	Bosch Thermotechnik Vermögensverwaltung 1 GmbH	Wetzlar	100.0
	BS Systems GmbH & Co. KG	Zusmarshausen	50.0
	CDE - Packaging GmbH	Glauburg-Stockheim	49.0
	ECP Energiecontracting GmbH	Pfullendorf	81.0
	Energiespeicher Nord GmbH & Co. KG	Braderup	45.0
	Energiespeicher Nord Verwaltungs GmbH	Braderup	45.0
	Escrypt GmbH	Bochum	100.0
	GFI Gesellschaft für Infrastrukturdienste mbH	Reutlingen	100.0
	Heliatek GmbH	Dresden	20.2
	Hubject GmbH	Berlin	16.7
	JCB Management GmbH	Hannover	20.0
	Johnson Controls Autobatterie GmbH & Co. KGaA	Hannover	20.0
	Knorr-Bremse Systeme für Nutzfahrzeuge GmbH	Munich	20.0
	Koller + Schwemmer GmbH	Nuremberg	100.0
	Lithium Energy and Power GmbH & Co. KG	Stuttgart	50.0
	Makat Candy Technology GmbH	Dierdorf	100.0
	Mobility Media GmbH	Berlin	100.0
	part GmbH	Bad Urach	50.0
	Prüfzentrum Boxberg GmbH	Boxberg	100.0
	Robert Bosch Battery Solutions GmbH	Eisenach	100.0
	Robert Bosch Immobilien GmbH	Stuttgart	100.0
	Robert Bosch Immobilienverwaltungs GmbH & Co. KG	Stuttgart	100.0
	Robert Bosch Start-Up GmbH	Stuttgart	100.0
	Robert Bosch Technical and Business Solutions GmbH	Schwieberdingen	100.0
	Service- und Betriebsgesellschaft Heidehof GmbH	Stuttgart	100.0
	SupplyOn AG	Hallbergmoos	42.1
	thermea. Energiesysteme GmbH	Freital	26.9
	Valicare GmbH	Frankfurt/Main	100.0

	Company name	Registered office	Percentage share of capital held
Europe			
Austria	Bosch General Aviation Technology GmbH	Vienna	100.0
	RobArt GmbH	Linz	22.0
Belarus	Robert Bosch OOO	Minsk	100.0
Belgium	EpiGaN N.V.	Leuven	24.6
Bulgaria	Robert Bosch EOOD	Sofia	100.0
Croatia	Robert Bosch d.o.o.	Zagreb	100.0
Denmark	Moeller & Devicon A/S	Sandved	100.0
	ScandiaPack ApS	Ballerup	24.2
Estonia	Robert Bosch OÜ	Tallinn	100.0
France	Bosch Packaging Technology S.A.S.	Saint-Ouen (Paris)	100.0
	Bosch Techniques d'Emballage S.A.S.	Hoenheim	100.0
	ETAS S.A.S.	Rungis	100.0
Georgia	Robert Bosch Ltd.	Tiflis	100.0
Greece	Bosch Rexroth S.A.	Athens	100.0
Hungary	Bosch Electronic Service Kft.	Kecskemét	100.0
	Bosch Packaging Systems Kft.	Pécel	100.0
Italy	ARESI S.p.A.	Brembate	100.0
	BARI SERVIZI INDUSTRIALI Società consortile a r.l.	Modugno	50.0
	Dana Rexroth Transmission Systems S.r.l.	Arco	50.0
	DECA S.r.l.	Lugo	100.0
	Oleodinamica Gambini S.r.l.	Modena	20.0
Kazakhstan	TOO Robert Bosch	Almaty	100.0
Latvia	Robert Bosch SIA	Riga	100.0
Lithuania	UAB Robert Bosch	Vilnius	100.0
Poland	Loos Centrum Sp.z o.o.	Warsaw	26.0

	Company name	Registered office	Percentage share of capital held
Russian Federation	Bosch Heating Systems LLC	Engels	100.0
	Robert Bosch Samara LLC	Chernovskiy	100.0
Serbia	Robert Bosch DOO	Belgrade	100.0
Slovakia	Robert Bosch spol. s.r.o.	Bratislava	100.0
	Valicare s.r.o.	Trencin	51.1
Slovenia	Robert Bosch d.o.o.	Ljubljana	100.0
Spain	Bosch Automotive Service Solutions S.A.	Guadalajara	100.0
Switzerland	BAOPT Swiss GmbH	Muri	100.0
	Bosch Automotive Service Solutions AG	Kriens	100.0
	Rotzinger AG	Kaiseraugst	46.7
Ukraine	Robert Bosch Ltd.	Kiev	100.0
United Kingdom	aleo solar UK Ltd.	Denton Island, Newhaven	100.0
	Beissbarth UK Ltd.	Nottingham	100.0
	ETAS Ltd.	York	100.0
	Lagta Group Training Limited	Motherwell	100.0
	Lagta Limited	Motherwell	100.0
	LCX Solar Limited	Shepperton	33.3
	Spore Holding Ltd.	Daventry	100.0
	VL Churchill Ltd.	Daventry	100.0
Americas			
Brazil	Bosch Management Support Ltda.	Campinas	100.0
	Bosch Termotecnologia Ltda.	São Paulo	100.0
	Ishida do Brasil Ltda.	Osasco	50.0
	Metapar Usinagem Ltda.	Curitiba-Paraná	100.0
Columbia	Robert Bosch Ltda.	Bogota	100.0
Mexico	Bosch Automotive Service Solutions S.A de C.V	Mexico City	100.0
Panama	Robert Bosch Panama S.A.	Panama City	100.0
Peru	Robert Bosch S.A.C.	Lima	100.0

	Company name	Registered office	Percentage share of capital held
United States	Akustica Inc.	Pittsburgh, PA	100.0
	Bosch Chassis Systems Columbia LLC	West Columbia, SC	100.0
	Bosch Energy Storage Solutions LLC	East Lansing, MI	100.0
	Bosch Management Services Corporation	Wilmington, DE	100.0
	Bosch Software Innovations Corp.	Chicago, IL	100.0
	Escrypt Inc.	Ann Arbor, MI	100.0
	Industrial Pharmaceutical Resources, Inc.	Bartlett, IL	49.0
	North America Fuel Systems Remanufacturing LLC	Kentwood, MI	50.0
	PBR International USA Ltd.	Knoxville, TN	100.0
	PBR Knoxville LC	Knoxville, TN	100.0
	RoboToolz Inc.	Mountain View, CA	100.0
	SS Great Lakes LLC	Bridgeport, MI	100.0
Venezuela	Bosch Rexroth S.A.	Caracas	100.0
	Robert Bosch S.A.	Caracas	100.0
Asia			
Bangladesh	Robert Bosch (Bangladesh) Ltd.	Dhaka	100.0
China	avim solar production Co., Ltd.	Gaomi	50.0
	Bosch (Donghai) Automotive Test & Technology Center Co., Ltd.	Donghai	100.0
	Bosch (Hulunbeier) Automotive Test and Technology Centre Co., Ltd.	Yakeshi	100.0
	Bosch (Ningbo) e-scooter Motor Co., Ltd.	Ningbo	60.0
	Bosch Automotive Components (Changchun) Co., Ltd.	Changchun	55.0
	Bosch Automotive Diagnostics Equipment (Shenzhen) Ltd.	Shenzhen	100.0
	Bosch Automotive Products (Nanjing) Co., Ltd.	Nanjing	100.0
	Bosch Automotive Technical Service (Beijing) Co., Ltd.	Beijing	100.0
	Bosch Car Multimedia Wuhu Co., Ltd.	Wuhu	60.0
	Bosch Laser Equipment (Dongguan) Limited	Dongguan	100.0
	Bosch Thermotechnology (Shandong) Co., Ltd.	Zibo	100.0
	Bosch Thermotechnology (Shanghai) Co., Ltd.	Shanghai	100.0
	Bosch Thermotechnology (Wuhan) Co., Ltd.	Wuhan	100.0
	Dalian Rexroth Control Technology Ltd.	Dalian	60.0
	Freud International Trading (Shanghai) Co., Ltd.	Shanghai	100.0
	Guangzhou sia Abrasives Company Ltd.	Guangzhou	100.0

	Company name	Registered office	Percentage share of capital held
	Loos China Ltd.	Hong Kong	100.0
	Nanjing Bovon Power Tools Co.	Nanjing	50.0
	sia Abrasives Company Ltd.	Hong Kong	100.0
Cambodia	Robert Bosch (Cambodia) Co., Ltd.	Phnom Penh	100.0
India	ETAS Automotive India Private Ltd.	Bangalore	100.0
	MHB Filter India Private Ltd.	Bangalore	50.0
	MIVIN Engineering Technologies Private Ltd.	Bangalore	100.0
	Precision Seals Manufacturing Ltd.	Pune	100.0
Indonesia	P.T. Bosch Rexroth	Jakarta	100.0
	P.T. Robert Bosch	Jakarta	100.0
	P.T. Robert Bosch Automotive	Jakarta	100.0
Israel	Utilight Ltd.	Yavne	25.0
Japan	Advanced Driver Information Technology Corporation	Kariya-shi	50.0
	Bosch Engineering K.K.	Tokyo	100.0
	Kanto Seiatsu Kogyo Co., Ltd.	Honjo	95.9
	Knorr-Bremse Commercial Vehicle Systems Japan, Ltd.	Tokyo	20.0
	Mecman Japan, Ltd.	Saitama-shi	40.0
Korea	ETAS Korea Co., Ltd.	Seoul	100.0
Malaysia	Pacific BBA (Malaysia) Sdn. Bhd.	Shah Alam, Selangor	100.0
	Robert Bosch (Penang) Sdn. Bhd.	Penang	100.0
Philippines	Robert Bosch Inc.	Manila	100.0
	Robert Bosch Communication Center Inc.	Manila	100.0

	Company name	Registered office	Percentage share of capital held
Thailand	FMP Distribution Ltd.	Rayong	50.1
	FMP Group (Thailand) Ltd.	Rayong	50.7
	Pacific BBA (Thailand) Ltd.	Bangkok	100.0
	Robert Bosch Automotive Technologies (Thailand) Co., Ltd.	Rayong	100.0
Vietnam	Robert Bosch Engineering and Business Solutions Vietnam Co., Ltd.	Ho Chi Minh City	100.0
Rest of World			
Australia	Bauer Optimising Technologies CLP	Sydney	100.0
	Bauer Optimising Technologies Pty. Ltd.	Sydney	100.0
	FMP Group (Australia) Pty. Ltd.	Ballarat	49.0
	Pacifica Group Pty. Ltd.	Melbourne	100.0
Egypt	Bosch Packaging Technology Ltd.	Cairo	100.0
	Robert Bosch Ltd.	Cairo	100.0
Kenya	Robert Bosch East Africa Ltd.	Nairobi	100.0
New Zealand	Bosch Rexroth Ltd.	Auckland	100.0
	Robert Bosch Ltd.	Auckland	100.0
South Africa	Hägglunds Drives South Africa (Pty.) Ltd.	Fourways	100.0

Stuttgart, March 13, 2014

Robert Bosch GmbH
The board of management

Auditor's Report

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

Report on the Consolidated Financial Statements
We have audited the accompanying consolidated financial statements of Robert Bosch Gesellschaft mit beschränkter Haftung, Stuttgart, and its subsidiaries, which comprise the income statement, the statement of comprehensive income, the statement of financial position, the statement of changes in equity, the statement of cash flows and the notes to the consolidated financial statements for the business year from January 1, 2013 to December 31, 2013.

Managing Directors' Responsibility for the Consolidated Financial Statements

The Managing Directors of Robert Bosch Gesellschaft mit beschränkter Haftung are responsible for the preparation of these consolidated financial statements. This responsibility includes that these consolidated financial statements are prepared in accordance with International Financial Reporting Standards, as adopted by the EU, and the additional requirements of German commercial law pursuant to § (Article) 315a Abs. (paragraph) 1 HGB („Handelsgesetzbuch": German Commercial Code) and that these consolidated financial statements give a true and fair view of the net assets, financial position and results of operations of the group in accordance with these requirements. The Managing Directors are also responsible for the internal controls Management deems necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with § 317 HGB and German generally accepted standards for the audit of financial statements promulgated by the Institut der Wirtschaftsprüfer (Institute of Public Auditors in Germany) (IDW) and additionally observed the International Standards on Auditing (ISA). Accordingly, we are required to comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing audit procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The selection of audit procedures depends on the auditor's professional judgment. This includes the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In assessing those risks, the auditor considers the internal control system relevant to the entity's preparation of consolidated financial statements that give a true and fair view. The aim of this is to plan and perform audit procedures that are appropriate in the given circumstances, but not for the purpose of expressing an opinion on the effectiveness of the group's internal control system. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the Managing Directors, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Audit Opinion

According to § 322 Abs. 3 Satz (sentence) 1 HGB, we state that our audit of the consolidated financial statements has not led to any reservations.

In our opinion based on the findings of our audit, the consolidated financial statements comply, in all material respects, with IFRSs, as adopted by the EU, and the additional requirements of German commercial law pursuant to § 315a Abs. 1 HGB and give a true and fair view of the net assets and financial position of the Group as at December 31, 2013 as well as the results of operations for the business year then ended, in accordance with these requirements.

Report on the Group Management Report
We have audited the accompanying group management report of Robert Bosch Gesellschaft mit beschränkter Haftung for the business year from January 1, 2013 to December 31, 2013. The Managing Directors of Robert Bosch Gesellschaft mit beschränkter Haftung are responsible for the preparation of the group management report in accordance with the requirements of German commercial law applicable pursuant to § 315a Abs. 1 HGB. We conducted our audit in accordance with § 317 Abs. 2 HGB and German generally accepted standards for the audit of the group management report promulgated by the Institut der Wirtschaftsprüfer (Institute of Public Auditors in Germany) (IDW). Accordingly, we are required to plan and perform the audit of the group management report to obtain reasonable assurance about whether the group management report is consistent with the consolidated financial statements and the audit findings, as a whole provides a suitable view of the Group's position and suitably presents the opportunities and risks of future development.

According to § 322 Abs. 3 Satz 1 HGB we state that our audit of the group management report has not led to any reservations.

In our opinion based on the findings of our audit of the consolidated financial statements and group management report, the group management report is consistent with the consolidated financial statements, as a whole provides a suitable view of the Group's position and suitably presents the opportunities and risks of future development.

Stuttgart, March 13, 2014

PricewaterhouseCoopers
Aktiengesellschaft
Wirtschaftsprüfungsgesellschaft

Harald Kayser
Wirtschaftsprüfer

Dieter Wißfeld
Wirtschaftsprüfer

Ten-Year Summary of the Bosch Group

T.82

Figures in millions of euros	2004	2005	2006	2007	2008	2009	2010	2011	2012[1]	2013
Sales	**38,954**	**41,461**	**43,684**	**46,320**	**45,127**	**38,174**	**47,259**	**51,494**	**44,703**	**46,068**
of which generated outside Germany (as a percentage)	72	73	74	75	74	76	77	77	77	77
Research and development cost[2]	2,715	3,073	3,348	3,583	3,889	3,603	3,810	4,190	4,442	4,543
as a percentage of sales revenue	7.0	7.4	7.7	7.7	8.6	9.4	8.1	8.1	9.9	9.9
Capital expenditure	2,377	2,923	2,670	2,634	3,276	1,892	2,379	3,226	2,714	2,539
of which in Germany	1,057	974	968	1,138	1,610	928	1,023	1,161	988	913
of which outside Germany	1,320	1,949	1,702	1,496	1,666	964	1,356	2,065	1,726	1,626
as a percentage of sales revenue	6.1	7.0	6.1	5.7	7.3	5.0	5.0	6.3	6.1	5.5
as a percentage of depreciation	135	156	116	108	136	80	100	142	101	126
Depreciation of property, plant, and equipment	1,758	1,870	2,309	2,428	2,410	2,374	2,373	2,265	2,689	2,008
Annual average number of associates (thousands)	234	249	258	268	283	275	276	295	273	280
of which in Germany	107	110	110	111	114	113	112	117	109	108
of which outside Germany	127	139	148	157	169	162	164	178	164	172
as of 12/31 of the year	238	251	261	271	282	271	284	303	273	281
Personnel expense	11,179	11,936	12,534	12,896	12,994	12,787	14,132	14,719	14,198	14,907
Total assets	**41,170**	**45,554**	**46,940**	**48,568**	**46,761**	**47,509**	**52,683**	**54,616**	**52,611**	**55,725**
Equity	17,428	20,943	22,482	24,825	23,009	23,069	26,243	26,917	26,900	27,686
as a percentage of total assets	42	46	48	51	49	49	50	49	51	50
Cash flow	3,977	4,352	4,521	5,052	4,032	1,910	5,460	4,959	4,053	3,956
as a percentage of sales revenue	10.2	10.5	10.3	10.9	8.9	5.0	11.6	9.6	9.1	8.6
Profit after tax	1,870	2,450	2,170	2,850	372	–1,214	2,489	1,820	2,304	1,251
Unappropriated earnings	63	63	69	72	75	67	82	88	88	88

[1] Adjusted for changes in accounting policies
[2] Including development work charged directly to customers

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Group Management Report

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Additional information about the company can be taken from the brochure **Bosch today,** as well as from the internet at **csr.bosch.com**

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