Into a **connected future**

Magazine supplement to the Annual Report 2012

BOSCH
Invented for life

That's how many patents are filed by Bosch each year. This is the equivalent of some 19 patents every working day – the payoff of a global network of some 42,800 researchers and engineers. These patents are the basis for the innovative products and solutions of the future.

People – technology – fascination: it is this triad that drives us at Bosch – day in, day out. People from diverse cultures and different backgrounds work together to develop new solutions. Their efforts result in innovations whose focus is on people. For example, vehicles can detect hazards even faster, and their occupants can be protected better. At the same time, the ongoing development of powertrain designs ensures that automobiles consume less fuel. In buildings, systems are being interconnected to make life and work safer, more pleasant, and more secure. By optimizing demand for electricity and heat, energy can be used more efficiently. The significance of using energy efficiently and generating power in a resource-conserving way will continue to grow in the future. Connected mobility, buildings, and energy – at Bosch, our hard work is driven by the wish to create a better world for people, as well as a better environment. That's what we call "Invented for life."

Into a **connected future**

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Across all sectors of industry, steps in the manufacturing process and the energy needed for them are being ever more closely interlinked and synchronized with each other. Machines and maintenance workshops share information with their control units in real time to stay abreast of malfunctions, servicing intervals, and new features. And as the numbers of electric cars increase, a charging infrastructure will become more important. Houses and apartments, for their part, will communicate their energy requirements online. Thanks to sensors, these connected buildings know if someone is in a room and where there is currently a need for energy. From cooking and washing to watching TV, the devices tell the “smart grid” how much power is needed.

Connected mobility, buildings, and power supply – still a long way off? Not at all. The Bosch Group currently offers innovative solutions for all these areas, and is working to develop them further, since the connected world is still in its infancy. As chips become more powerful,

this connectivity will grow. A modern smartphone is comparable with a mainframe computer from 1994. More and more devices and systems from the most diverse areas of life and business are automatically sharing information.

Anyone wanting to actively shape these developments has to have cross-sector knowledge and the experience to match. Bosch has been active in the areas of mobility, buildings, consumer goods, industrial technology, mechanical engineering, and energy for many decades. They are becoming increasingly more integrated in an interconnected system: from the drive unit and display of an e-bike, to energy-efficient office complexes, to a global manufacturing network. For a technology and services company such as Bosch, this development is both a challenge and an opportunity for the future.

Unseen, but wide awake

High-tech helpers are always on duty

Meetings, critical market analyses, and then, to top it off, the boss insists on having the “Vision 2020” file. And now there’s still at least an hour in the car before the workday is finally over. No doubt the children will be waiting impatiently. Tired and exhausted, Pete gets behind the wheel. “What a day!” he mutters, and starts the engine. At the traffic light, the car behind sounds its horn. What’s all that about? Pete looks in the rear-view mirror, irritated. The car’s driver is gesticulating wildly at him. The light has obviously been green for some time. Shaking his head, his eyes still fixed on the rear-view mirror, Pete pulls away and starts to turn left onto the freeway ramp – like every other day. But the car brakes suddenly, and a loud alarm sounds. Just in time, the sensors of the emergency braking assistant have detected a broken-down vehicle blocking the acceleration lane, and braked Pete’s car, thus preventing a serious accident.

Shaken, Pete thinks, “That was close.” Thank goodness, at least his car was vigilant. He can almost hear his nine-year-old son Joe’s voice in his ear: “You have to pay more attention, too!”

Driver assistance systems often have only milliseconds in which to measure, analyze, and react. But they can mean the difference between life and death.

The sequence of events for preventing an accident:

- The **radar sensor** detects a potential obstacle.
- An **acoustic warning system** tells the driver to brake.
- An **automatic brake pulse** draws the driver's attention to the road.
- **Automatic partial braking** decelerates the vehicle.
- If the driver fails to react, **automatic full emergency braking** is initiated shortly before a possible collision.

www.bosch.com/extrasensory-perception/

Pete can't help smiling at the thought. Once on the freeway, he relaxes. Now where was the USB stick with that fantastic concert...? Pete catches sight of the case on the passenger seat – but it's not easy to reach. He tries to grab it with one hand, while keeping the other on the wheel. Suddenly the steering wheel starts to vibrate.

"What was that?" he thinks, finally managing to grab the stick.

Once again, the car emits a high-pitched alarm and brakes sharply. A traffic jam! Pete was about to run into the car in front of him. He slams on the brakes and feels the wheels shake in a rapid staccato. The ABS antilock braking system is kicking in to minimize the braking distance.

Thanks to a host of unseen yet highly responsive high-tech helpers, the absent-minded Pete finally arrives home unscathed. The amount of data these helpers can process is phenomenal. When the car is in motion, for example, the ESP® electronic stability program checks 25 times a second whether the vehicle is actually heading in the direction the driver wants it to go. If there is a discrepancy, ESP® intervenes. It reduces engine torque in order to restore vehicle stability. If that is not enough, then it applies the brakes to individual wheels. Together with the TCS traction control system and the ABS, this electronic assistant helps restore balance to the wheels and keep the car on course.

However, even if Pete had not reacted quickly enough to the car in front of him despite these assistance systems, he would not have been unprotected. In very precarious situations, the ACC adaptive cruise control that helped Pete can help in other ways too. If it senses that a collision is no longer avoidable, it sends a signal to the airbags, which actively prepare for deployment. At the same time, the seat-belt pretensioners secure the passengers in their seats. These intelligent occupant-protection electronics can even distinguish between different types of accident and estimate the severity of the collision, thus coordinating the deployment of the individual airbags. After the accident, the airbag control unit shuts off the fuel supply, unlocks the doors, and disconnects the power supply. If the car is also equipped with eCall, it can automatically make an emergency call, transmitting the vehicle's exact position. The interaction between these closely networked components has to work immediately and seamlessly, as an accident and the events leading up to it are over in the blink of an eye. In this emergency network, driver assistance systems often have only milliseconds in which to measure, analyze, and react. But they can mean the difference between life and death.

Even in less dramatic circumstances, these components instantaneously measure, control, and regulate information from the different parts of the vehicle. The engine, transmission, brake, battery, lighting, air conditioning, and navigation systems are all continuously adapting to the vehicle's current situation. They are constantly sharing information, unbeknown to Pete. He now turns into his driveway, relieved that the journey is over. Joe and his two sisters run out of the house, shouting,

"Daddy, you're home!"

Pete hugs his children and glances back at his car with its many hidden guardian angels. "I can't imagine driving without this additional safety any more," he thinks, and goes into the house with his children. ●

Letting go means MORE
A better balance between work and private life

"The quality of my life has improved." For Bernhard Krauss, a marketing expert at Power Tools, a three-month experiment has proved to be the source of a long-term solution. Mondays belong to his family. He forgoes part of his salary to spend more time with his three small children. "I would like to spend more time with my children now, at this stage in their lives," he explains. Thomas Mohl and Pascal Oestreich also spend one day a week at home, but unlike Bernhard, they spend the day working. All three men have had to rethink and reorganize the way they work to achieve this. And in return, they have more job flexibility and can spend more time with their families.

The marketing expert Bernhard Krauss (right) has reorganized his office routine, and can now make more efficient use of his time.

The experiment was launched to mark the 125th anniversary of the Bosch Group in 2011. For three months, 125 executives were to be given the opportunity to test flexible working time models for themselves. They were given the option of working from home for a day or working part-time. The idea was to spend less time in the office and promote a more results-driven approach, while also striking a better balance between work and private life. More than 300 men and women applied to take part in the experiment, known as MORE (mindset organization executives). "For us, this is proof that flexible working schemes are becoming more and more important," says Karl-Heinz Schrödl, the head of the corporate department for human resources management. In the end, more than 150 executives worldwide took part in the program.

"The MORE initiative aims to bring about a change in our working and management culture at Bosch," says Karin Pardon, the project manager. The job of the executives is to act as ambassadors for the program. Their experience was so positive that 80 percent of participants would like to continue using their new working models. For Pascal Oestreich, a product manager in the Diesel Systems division, the project was a "success." He adds that both he and his team initially had to get used to his working from home in the middle of the week. But overall, the response to the new working model was positive. His colleague Thomas Mohl, who is in charge of product management in the commercial vehicles business unit of the Diesel Systems division, agrees. For him, one of the best things about the experiment was the freedom to focus on strategic issues without the office's daily distractions to hold him back. As a result, he encourages his staff to follow his example.

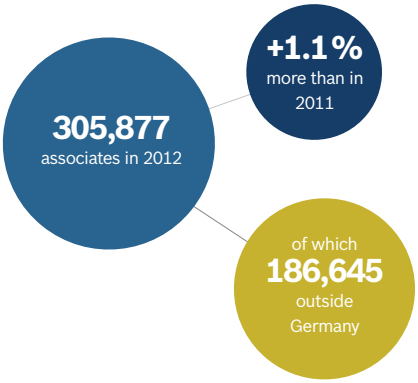
The three-month project also gave Bernhard Krauss time to think about his own roles and how he could strike a better balance between work and family life. "Our family life changed dramatically when our twins were born," he says. Nonetheless, letting go of a work routine that has become second nature over the years is not easy. "In the beginning, it takes self-

discipline not to dash off a couple of emails during the family day," he says. He also had to weigh up whether the remaining salary could support a family of five. In retrospect, however, he believes that spending more time with his family is worth the financial sacrifice. He has restructured and reorganized his time in the office. "It's going really well. I feel much more relaxed when I go to the office now."

"During the project, many participants came to realize that performance has little to do with physical presence," Karin Pardon says. In other words, it is not a sign of weakness or lack of ambition if someone chooses not to stay in the office until all hours, but instead to have dinner with their children. Everyone benefits in the long term – family, associates, and the company.

That's why MORE is being continued. More than 500 executives will test flexible working hours in 2013. The Bosch board of management has also signaled its commitment to a more flexible and family-friendly working culture within the company. "This is the reason we have drafted guidelines to promote a better balance between work and home life," says Christoph Kübel, who is responsible on the board of management for human resources. With this goal in mind, it is hoped that greater use will be made of the more than one hundred working time models available at Bosch. ●

Bosch Group
associate numbers



Thanks to MORE, there's more time for exciting contests in the living room.

eCall

Support from afar

Pronto? Mi sente? Cos'è successo? The concerned voice over the speaker is speaking Italian – in the middle of France! Enzo Rossi can hardly believe it. He is still trembling from the shock of the accident, but is pleasantly surprised to find that a friendly voice is speaking in his own language, asking how he is and how she can be of assistance. When she asks him whether he is hurt and how he feels, his reply is vague. But Ramona Schwarz – the woman behind the voice – now knows that there was no one else in the car, and that someone smashed into Enzo Rossi's car on the freeway near Dijon. She passes on this information to her colleague Kai Birke, who contacts the local police.

eCall makes it possible to provide more **accurate and effective** support when help is needed.

The location of the car and the direction of travel are determined using **GPS** data. This information is especially crucial on the freeway.

However, Ramona Schwarz and Kai Birke are not speaking from France or Italy. They coordinate emergency responses from Magdeburg in Germany. As a result of the collision, eCall notified the Bosch operations center and automatically set up a voice connection. The emergency call system is activated by the same sensors that deploy the airbag. The location of the car and the direction of travel are determined using GPS data. This information is especially crucial on the freeway. Enzo Rossi's navigation system is set to Italian, which is why the emergency call was routed to Ramona. As well as Italian, she is responsible for emergency calls in English and Spanish. The Bosch operations center currently covers the most common languages in just under 20 European countries.

Often, after a car accident, every second counts for the victims. Bosch eCall solutions help to ensure that the emergency services are notified more quickly about incidents such as Enzo Rossi's, so that they can be on the scene earlier to save life and limb. Bosch has been offering this service for Mercedes-Benz vehicles since summer 2012. It can cut emergency service response times by up to 50 percent in rural areas and 40 percent in urban areas. The European Commission estimates that eCall could save the lives of around 2,500 people every year in the 27 EU member states. It also provides better information about the extent and consequences of the accident. For this reason, the European Commission wants to make eCall mandatory by 2015.

The global network of
Bosch communication centers

Australia: Melbourne
Brazil: Joinville, São Paulo
China: Chengdu, Shanghai
Germany: Frankfurt (HQ), Berlin, Magdeburg
France: Châlons, Forbach, Paris
Netherlands: Nijmegen
Philippines: Manila
Portugal: Lisbon
Romania: Timişoara
Russia: Kazan, Moscow
Spain: Barcelona, Madrid, Vigo
U.S.: Fairport (NY)

By drawing on its Security Systems, Chassis Systems Control, and Car Multimedia divisions, Bosch can provide all the main components and processes that make up an eCall solution. Car Multimedia is one of the most experienced providers of navigation and infotainment systems. Chassis Systems Control provides a whole series of driver assistance systems such as ABS, ESP®, ACC adaptive cruise control, predictive emergency braking systems, and Night Vision, which allows drivers to see people or objects on or next to the road when visibility is bad. To ensure eCall works smoothly, Bosch Communication Center – a business unit of Bosch Sicherheitssysteme GmbH – has developed a technical and operations platform that runs simultaneously at multiple sites.

“We already offer the eCall service independently of local rescue services. In fact, we even go one step further. Bosch eCall makes it possible to support rescue operations more precisely and effectively,” says Matthias Turck, who works as a product manager for monitoring services at Bosch Communication Center. The center’s specially trained associates play a key role. As intermediaries, they provide the local emergency services with all the relevant facts in a professional and efficient manner. But there is more to it than that. They also play an important psychological role. “More than 25 years of experience in the field of security services teaches us that the opportunity to speak directly with someone in stressful situations like these can be a source of great support and relief,” says Matthias Turck. At the same time, Bosch Communication Center also filters out emergency calls that were triggered unintentionally, thus reducing the burden on emergency control centers. Since as far back as 2004, Bosch has been working as a clearinghouse liaising closely with the relevant authorities to handle emergency calls.

All information passes through the Bosch operations center in Magdeburg.

eCall systems have also been available for motorcyclists in Germany since fall 2012. In this case, the alarm is triggered by a specially equipped helmet. The concept stems from an idea by Matthias Ruh, Daniel Heiser, and Marius Gutzeit, three students from the Erich Kästner comprehensive school in Bürstadt, Germany. They designed the helmet as part of the “Jugend forscht” youth science competition, which is sponsored by Bosch. The helmet is fitted with two copper networks, one on top of the other. Under normal circumstances, these networks do not come into contact with each other. As soon as the networks connect (for example, in the event of a collision), the completed circuit generates a signal that triggers an emergency call. The helmet manufacturer Schubert GmbH, the Björn Steiger Foundation (a charity which raises funding for emergency services), Deutsche Telekom AG, and Bosch joined forces to develop and refine the idea. For some motorcyclists, this may be a lifesaving partnership. ●

Renningen Networked for millions of ideas

The cranes high above the small south German town of Renningen can be seen time ago there was a deep construction pit, the first building structures are now field. The groundbreaking ceremony was held as the sun rose on June 11, 2012.

www.bosch-renningen.com

from far and wide. They indicate that something big is afoot. Where just a short starting to take shape. In spring 2012, the former landing strip was still a green It was a symbol of the start of a new era.

Five researchers with vision. Mahmoud Hamada, Dr. Frank Niewels, Dr. Karin Sämann, Dr. Jan Göhler, and Sonja Dudziak will all do research at the new site in Renningen.

"We want Renningen to be the source of inspiration for innovations. Such innovations will continue to be essential for the **future** development of our company."

Dr. Volkmar Denner, chairman of the Bosch board of management

Dr. Frank Niewels, who attended the groundbreaking ceremony, is thrilled: "It's really impressive to see how fast construction is coming along." His colleague Sonja Dudziak, an engineer who develops innovative battery solutions, is also amazed by the progress being made at the site: "I can already picture the new location in my mind's eye." She then turns to the valley below and the small town of Renningen: "Looking down there, you realize who you're working for – the people. For me, that's the real meaning of 'Invented for life'!"

This site, with its cranes, mud, and unfinished structures, will see the emergence of a very special high-rise by the end of 2013. Its salient feature will be its three horizontally staggered levels. This 60-meter tall, unusually shaped building will be a new landmark. The campus will be an important hub in the international research network, both within Bosch and in dealings with leading scientific centers of excellence worldwide. The Bosch site supervisor Petra Kinkartz is confident: "We're on schedule and making excellent progress."

Despite the brisk pace of construction on the main building, the first of the 1,200 researchers and engineers will not be able to move in until the end of 2014, as the interior fixtures are the real challenge in this project. Of the more than 300 million euros Bosch is investing in Renningen, more than one-third is set aside for technical equipment and machinery. The result will be a new research infrastructure with 14 different buildings and a total floor space of more than 100,000 square meters. "This site underlines the importance of in-house research at Bosch," Niewels says. After all, even a large company like Bosch does not make investments on this scale every day.

The site will have the feel of a university campus. "There will be numerous meeting points both inside and out to encourage spontaneous contact with other specialist departments. A relaxed atmosphere can give rise to many ideas," says Jan Göhler, who works on the development of new materials. He expects that the new research campus will also be a magnet for scientists and PhD students from around the world. "We will be able to

42,800

associates in development

Over the last 20 years, the Bosch Group has invested around 50 billion euros in its own research and development activities, including 4.8 billion euros in 2012 alone. A total of 42,800 men and women work in R&D at 86 Bosch locations worldwide. The success of their work can be gauged by the 19 new patents the company registers every working day.

work together more efficiently once all researchers are based at the same location," says Mahmoud Hamada, a specialist in the unit for advanced functional materials and microsystems technologies. He hopes that the new location will lead to a greater exchange of information with colleagues from external institutes and other research locations such as the Bosch Research and Technology Centers (RTC) across the globe. The latter make research activities known internationally, tap into local scientific potential, secure access to ideas, and observe trends.

One-third of the associates from the corporate sector for research and advance engineering currently work in the Stuttgart area, either at the Bosch Group's headquarters in Gerlingen-Schillerhöhe some 20 kilometers away, or in the nearby towns of Waiblingen and Schwieberdingen. "I hope that the various specialist departments will be able to work together more effectively," says Dr. Karin Sämann. She can already imagine the analytics building that will be home to her plastics technology department in the future. She currently has to travel from Waiblingen to meet research staff from other departments.

"The internet is no substitute for direct contact among individuals," says Niewels, who develops new driver assistance systems. His department is currently based in Schwieberdingen. "We will have ideal conditions. It will be up to everyone involved to actively make the most of this opportunity," he says, looking in the direction of the former airfield's landing strip, where he and his colleagues will be able to test and refine the newly developed systems in the future. Jan Göhler also hopes that flexible working models will increasingly be embraced at the new location so as to further optimize the balance between work and private life. Karin Sämann, who is visiting the construction site for one last time before going on maternity leave, agrees. She looks forward to having a children's daycare center nearby when she returns.

Expectations are high for associates at the new research center in Renningen: "We want Renningen to be the source of inspiration for innovations. Such innovations will continue to be essential for the future development of our company," says Dr. Volkmar Denner, chairman of the Bosch board of management. He believes that

"This site underlines the **importance** of in-house research at Bosch."

Dr. Frank Niewels

"We will be able to **work together more efficiently** once all researchers are based at the same location."

Mahmoud Hamada

the networked environment that Bosch is striving for in Renningen also stands as a perfect example of the development that can be expected in the coming years – technologically, economically, and socially. "Mobility, buildings, power supply, and much more. We at Bosch have our eye on a whole range of dynamic marketplaces around the globe. For our company, this means that we must increasingly think in terms of networking. That's why we've given our project here in Renningen the slogan 'networked for millions of ideas'," says Denner, whose responsibilities on the Bosch board of management also include research and advance engineering.

Renningen will be an important hub in the Bosch research network, working closely with the RTC Research and Technology Centers in Yokohama (Japan), Palo Alto and Pittsburgh (USA), Shanghai (China), Singapore, and St. Petersburg (Russia). "We are also involved in over 250 partnerships with universities, research institutes, and industry," says Dr. Klaus Dieterich, president of the corporate sector for research and advance engineering. The planners from the Bosch corporate department for real estate and facilities have placed great emphasis on running the location as resource-efficiently as possible. They hope to save some 30,000 cubic meters of drinking water each year, first by using rainwater both to cool the building and as service water and, second, by operating its own wastewater treatment plant. ●

"I hope that the various specialist departments will be able to **work together more effectively.**"

Dr. Karin Sämann

"A relaxed atmosphere can give **rise to many ideas.**"

Dr. Jan Göhler

"Looking down there, you realize who you're working for **– the people.** For me, that's the real meaning of 'Invented for life'!"

Sonja Dudziak

In Vietnam, Bosch is getting ready to meet the challenges of a dynamic future market.

Determination and staying power

There is no escaping the incessant noise caused by the swarms of two-wheelers buzzing like bees along the streets of Ho Chi Minh City, Vietnam. They have come to represent the irrepressible will of the Vietnamese people to keep moving forward. Everyone is constantly looking for the next gap in the traffic – every gap is an opportunity to keep moving. The system only falters if someone comes to a halt, forcing everyone else to brake, and earning themselves a few irritated looks in the process. Standing still is not welcome in Vietnam.

On the Bosch parking lot in Ho Chi Minh City, two-wheelers dominate the scene.

On the streets of Ho Chi Minh City alone, there are roughly three million two-wheelers.

"In a **fast-growing market,** the right course has to be set quickly and resolutely..."

Vo Quang Hue

In Vietnam's largest city, tradition and modernity coexist.

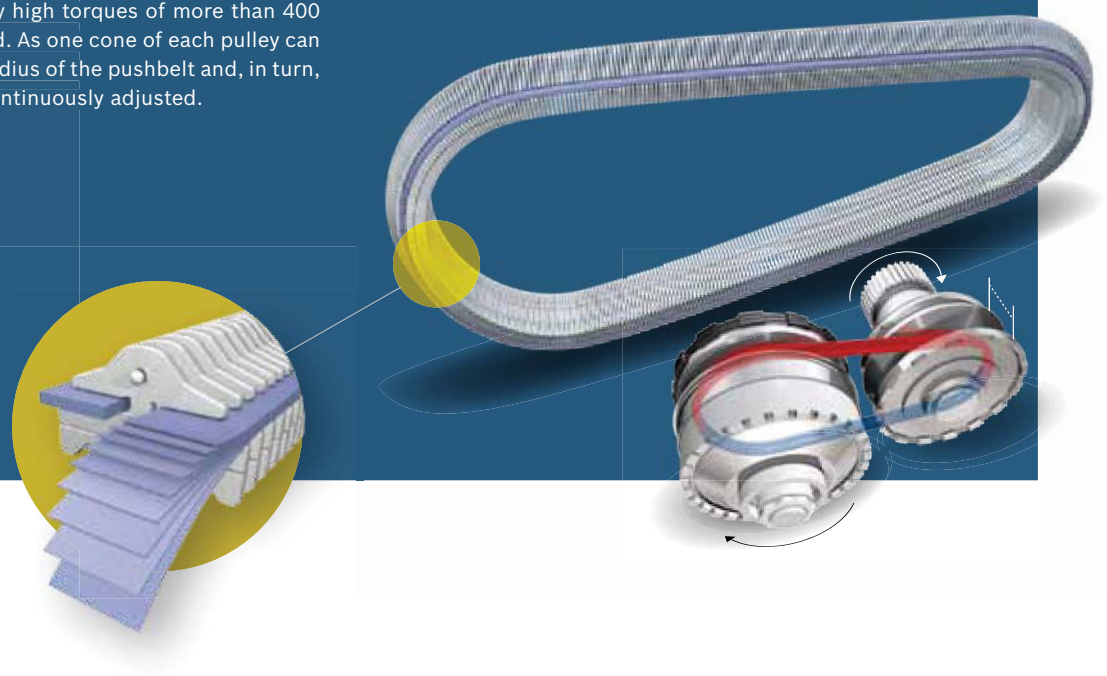
Since Vietnam joined the World Trade Organization at the end of 2006, there has been no holding it back. Its WTO membership also marked the start of the race to catch up in economic terms, as it created the conditions necessary for foreign investors and companies to invest in the country. In the economic hotspot that is Ho Chi Minh City, space is already at a premium. And this applies to Bosch, too. "That's where we started five years ago," says Vo Quang Hue, pointing out of his twelfth-floor office to a skyscraper on the distant horizon of this seven-million-strong city. There were only a dozen associates back then. He gazes out of the office window. "We need more space," he says. He speaks accent-free German, which he learned as a student in Aachen and perfected while working for an automaker. Today, Vo Quang Hue is "Mr. Bosch Vietnam": He is responsible for the activities of all Bosch divisions in the country. "This type of networking across all divisions at a regional company is very effective," he says. In a fast-growing market, he adds, the right course has to be set quickly and resolutely. Thanks to the organizational structure in Vietnam, he feels he has been successful.

The three floors Bosch occupies in the 14-story "Golden Building" on the Dien Bien Phu transport axis have long been bursting at the seams. A good 30 minutes away, the Bosch engineering center employs another 250 associates, and it too is clearly focused on growth. There are plans for 500 associates to be working there by 2014. Sudhakar Kunte, the head of engineering, wants to have 2,020 associates by the end of the decade. If he succeeds in his "Double 2020" policy, he may need a dedicated building to accommodate this team. Initial plans for a new Bosch building in Ho Chi Minh City have already been drawn up, but realizing them is not quite as easy. As the country has grown, land prices have skyrocketed. Land in the city center costs around 3,500 euros per

Pushbelts
Thrust that lasts as long as the car

A continuously variable transmission (CVT) comprises a driving and a driven shaft, each of which has a pulley splined on. Each pulley is made up of two cones that face each other. A metal pushbelt rides in the V-groove between the two cones of each pulley, linking the driving and the driven shaft and transmitting drive power from the engine to the wheels by means of shear force. The transmitted shear force makes the pushbelt as strong as a steel rod, which allows very high torques of more than 400 Newton meters to be transmitted. As one cone of each pulley can move along its shaft, the pitch radius of the pushbelt and, in turn, the transmission ratio can be continuously adjusted.

The variable distance between the pulley halves thus offers almost infinitely variable transmission ratios, making driving both smooth and sporty. The combination of special transmission mechanism and intelligent electronic control makes for a constant optimum balance between required torque and engine speed, and thus provides optimum engine efficiency at all times. The result is low fuel consumption and reduced CO_2 emissions.



Up to 400 steel elements transmit force on one single pushbelt.

square meter. By way of comparison: a worker earns around 150 euros per month and a salaried employee between 400 and 700 euros on average. Rent is already so high that families often need several incomes to make ends meet.

Watching the Bosch factory grow in Long Thanh, 50 kilometers east of Ho Chi Minh City, is almost like watching a time-lapse film. The plant currently employs around 700 people, and this number is set to rise to 1,500 within two years. Half the available space will then be in use. When asked about the strategic importance of the region, Ryosuke Masumitsu, the manager of the Bosch plant in Long Thanh, says: “We are ideally positioned to serve our customers in Asia and North America from here.” He knows exactly what he is talking about. The pushbelts manufactured here are used in millions of automatic transmissions, especially those of Japanese automakers, whose factories are located in Japan, China, Indonesia, Thailand, Mexico, and the United States. The location in Dong Nai province is therefore situated at the heart of a supply network that spans the globe.

The Bosch factory was built on a greenfield site far from the city. However, a number of other – mainly Japanese – multinational corporations have now also opened plants in this once remote industrial park. “Construction of a freeway to Ho Chi Minh City is currently underway. There are plans to build a new international airport here, just a few min-

Ryosuke Masumitsu expects the workforce of the Long Thanh plant to double. The plant can supply the Asian market, as well as customers in North America.

Left: **Sudhakar Kunte and Nguyen The Luan (right)**
The software experts from the engineering center in Ho Chi Minh City work with their Indian colleagues in Bangalore to develop solutions for customers such as Japanese automakers.

Right: **Nguyen Trong Vo**
In Vietnam as well, qualified executives are in great demand: the 35-year-old manufacturing engineer has been with Bosch for four years, and heads up a unit with 165 associates.

utes away by car, and a new deep sea port is also under construction south of the city," Masumitsu says. As he points these places out on a map, the strategic considerations behind the location of the plant become clear: companies that set up operations in emerging markets have to plan ahead and act quickly to avoid missing the best locations.

Masumitsu is in charge of a global team. As well as Vietnamese, associates from more than ten countries work here, including Germany, the U.S., Russia, Japan, Australia, and France, as well as Dutch associates from the lead plant in Tilburg. Their task is to bring new Vietnamese associates up to speed on the leadership principles at Bosch. Masumitsu calls this parallel staffing of management positions – where the experienced Bosch manager gradually steps back to make way for his Vietnamese partner – the "tandem principle." As Vo Quang Hue says: "We can only achieve our growth targets by building up a core team of local people."

Nguyen Trong Vo says that the opportunities to progress up the career ladder are what keep him at Bosch. "I worked for three other companies before joining Bosch in 2008," the 35-year-old production engineer says. It is not unusual for people to change jobs several times in Vietnam. If they are young and well trained, they can choose where they want to work. Staff turnover rates of 10 to 20 percent per year are regarded as normal in Vietnam. This is a problem for many compa-

"My friends ask me why I've stayed with the same company for so long."

Phung Hong Anh

Vietnam	
Official language:	Vietnamese
Capital city:	Hanoi
Form of government:	Socialist people's republic
Area:	331,698 km²
Population:	91,519,289 (as per July 2012)
Population density:	280 inhabitants per km²
Annual population growth:	+1.15 %

nies. Many specialists have barely learned the ropes before they move on – possibly taking their skills to the competition.

Bosch is attempting to counteract this trend by offering additional benefits such as training, free meals, bus transfers to and from work, and even health insurance for family members. For Nguyen Trong Vo, who was one of the first associates in Long Thanh, staying with the company has been worth it. He now manages a department with a total of 165 associates. His colleague Nguyen The Luan, a 35-year-old software specialist who worked for a Japanese company before joining Bosch, has been at the engineering center in Ho Chi Minh City for four years. “Here at Bosch, processes are clear and decisions are transparent,” he says. He is part of the Bosch Group’s Asian software network. He and his Indian colleagues in Bangalore work autonomously to develop solutions, mainly for the Japanese automotive industry.

“My friends ask me why I’ve stayed with the same company for so long,” says Phung Hong Anh, who has been working in marketing in the Power Tools division for four years now. She likes having the freedom to make her own decisions, and speaks glowingly of the way she is asked for her opinion. She has also been impressed by the Bosch values such as openness and fairness. “They don’t just exist on paper. They are really put into practice. I have never experienced that anywhere else and my friends all say it’s not like that at their companies.”

Up to now, Vietnam’s growth has been driven almost entirely by exports. But this dependency does not worry Vo Quang Hue. He points out that Bosch already sells power tools, spare auto parts, mechanical engineering components, and products from the Thermotechnology and Security Systems divisions in Vietnam. “It’s just a matter of time before Vietnamese products are produced for sale in Vietnam itself and not just for the global market.” He says that the elite in his country are investing more and more in the domestic market, thus laying the foundations for sustainable growth. Sudhakar Kunte agrees. He has a clear vision of how the Vietnamese economy will take off: “By the end of the decade, 25 percent of the software we develop will be for Vietnamese customers.” ●

Only a question of time: soon, the Vietnamese will manufacture products not just for global markets, but also to satisfy demand in their own country.

In Vietnam, Bosch associates such as **Ho Huy Bang** make pushbelts. Power tools, auto parts, and components for the Thermotechnology and Security Systems divisions are also sold in the country.

Interview with Michael Blichmann, the general manager of Bosch Energy and Building Solutions GmbH

Reliability is our top priority

Through its subsidiary “Bosch Energy and Building Solutions” (BEBS), the Bosch Group has been providing energy-related services to large complexes such as hospitals, office parks, or medium-sized businesses since 2010. These activities focus on optimizing the way various supply systems are connected, with a view to using energy as effectively as possible, and consequently cutting costs as well as conserving resources. The new company’s workforce now numbers 80 specialists. Michael Blichmann, who heads up the Bosch energy services subsidiary, explains why solutions that cover all aspects of efficient energy supply have an increasingly important role to play.

Michael Blichmann's tenure as general manager of Bosch Energy and Building Solutions GmbH, a wholly owned subsidiary of Robert Bosch GmbH, started in October 2011. Since completing his degree in business administration, he has been working in the energy industry in a variety of positions for over 25 years.

The BEBS specialists Dr. Wolfgang Schneider, Gökhan Dogan, Sybille Graef, and Monika Heimpel (from left to right) work together with colleagues from other Bosch divisions to develop solutions for customers.

"In our business, the internet of things and services is a growing phenomenon. These networks will give rise to many more solutions and services geared to increasing energy efficiency."

Dr. Wolfgang Schneider advises customers on how to use energy efficiently.

"We also operate **decentralized cogeneration plants** for our customers and charge them only for the heat or electricity they actually use."

Mr. Blichmann, what are the customers of Bosch Energy and Building Solutions looking for?
Whatever their field of business, our customers are facing increasingly fierce competition. Their response is to comb through all their costs for potential savings. Those with large buildings in particular find energy is becoming a more important factor. Just think about cooling in data processing centers or electricity and process heat in a manufacturing plant. In hospitals, for instance, energy is second only to personnel costs as an expense. As a result, our customers look to us to noticeably streamline energy use and hence reduce costs.

Can you put a number on that?
We generally work on the assumption that energy consumption for any existing building can be trimmed by at least 20 percent.

Why weren't such steps taken long ago? Cost pressure is nothing new.
Not only have dramatic rises in energy costs escalated the urgency of the situation, but also technical solutions are available today that didn't exist a few years ago. Thanks to these technological advances, we can unlock new potential for greater energy efficiency in our customers' operations. At the same time, power supply systems are becoming more and more complex. That's why companies, especially medium-sized companies, are looking to entrust this aspect of their business to a specialist service provider – leaving them free to devote their time and resources to what they do best.

What has changed behind wall sockets to make things so complex?
Decentralized power generation, for one, has made things more complex on the supply side. Keeping tabs on the big picture and getting the best out of what's on offer is no easy task. Take, for instance, intelligent networks – better known as smart grids. The ranks of devices and systems connected with one another via the internet are swelling. In our business, the internet of things and services is a growing phenomenon. In the coming years, these networks will give rise to many more solutions and services geared to increasing energy efficiency. Dynamic electricity rates are just one example of this.

What kind of rates are those?
This is a pricing system that fluctuates depending on overall demand. Electricity is very expensive during peak hours, but it becomes more affordable at night. This is the energy industry's way of attempting to flatten out the spikes in demand. We can take advantage of these rates today because we are able to precisely

"In Germany alone, the market volume for **energy-related services** will grow from 2.5 billion euros today to almost four times that in a decade."

meter and control the electricity, heating, and cooling requirements in a building at any given time. At times when electricity prices are high, certain equipment can be switched off and then put back into full operation when rates drop at night.

Hospitals and plants with complicated manufacturing processes require a constant supply of electricity. Shutting equipment down is hardly an option. How can you help them?

Even in those facilities there are systems and machinery that are not in constant use. With the appropriate control measures in place, these facilities can also reap the rewards of switching equipment off. Ultimately, however, you're right. In the case of facilities that require a constant supply of electricity, acquiring a dedicated power plant, for example, should be seriously considered – especially as the plant can be precisely tailored to the customer's needs.

But these customers have to invest heavily before they can eventually see any savings...

Not necessarily. We also operate decentralized power plants for our customers and charge them only for the heat or electricity they actually use. A careful case-by-case assessment is made to determine what is required, what upfront costs this will incur, and what makes the most sense for the customer. This clearly shows just how important customized power supply services are going to be. In a few years' time, an individually tailored service will probably even be the make-or-break factor in selecting an energy supplier.

Operating power plants is really the big utilities' core business. What can Bosch offer customers that they can't?

Word is spreading that Bosch has a broad base of expertise. We can turn to our colleagues at Bosch Thermotechnology to draw on their decades of experience in operating combined heat and power plants, for example, or reach out to the Bosch Security Systems team to help with optimizing networks and control systems at complex sites. At Bosch Rexroth, we have a ready source of knowledge on streamlining manufacturing plants and facilities. Consequently, our customers see Bosch in a completely different light from a company that specializes solely in selling energy.

What exactly is your approach?

Our experts start by analyzing the status quo on site. From there, they can calculate the potential gains in efficiency and determine the appropriate methods for achieving them. A central aspect of this is working out how energy can be used as effectively as possible. After all, if energy isn't used, there's no need to supply it in the first place. For instance, we investigate whether heat released during a manufacturing process can be used to generate electricity or heat other areas of the building. As I've already mentioned, it often pays for large sites to run their own combined heat and power plant.

Describe a typical BEBS associate.

That person doesn't exist as such. Our teams of incredibly diverse associates – including many engineers – are put together according to each project's requirements.

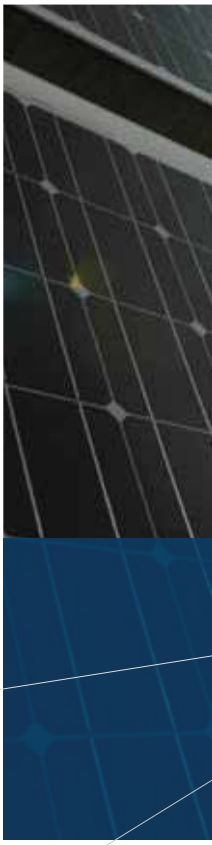
The teams also liaise with colleagues from other Bosch divisions so that together they can find the best solution for the customer. Sometimes customers approach us directly, but we also come on board to support individual divisions in serving their customers.

How big is the market you are active in?
It's a rapidly expanding market. In Germany alone, the market volume for energy-related services will grow from 2.5 billion euros today to almost four times that in a decade. We expect that markets in other major industrial countries, such as those here in Europe, will follow a similar trajectory.

The number of competitors fighting for a slice of the pie must be proportionately large. How do you plan to get the upper hand?
When it comes to power supply, our customers aren't taking any chances. Reliability is the top priority. Production lines that grind to a halt or an office complex without power can easily cause six-figure losses – not to mention the threat to human life if a similar scenario were to occur in a hospital. Uninterrupted supply is therefore a non-negotiable. That's why customers look for a partner with a proven track record in technical expertise and the ability to go the distance. Bosch fits the bill. ●

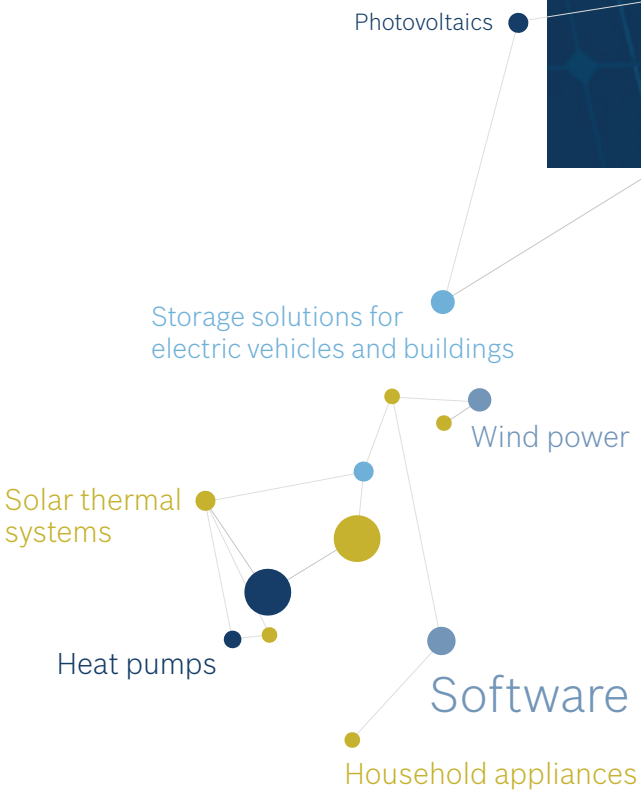
No energy, no future

To be able to provide a reliable power supply in the future, renewable sources of energy are the alternative to fossil fuels.

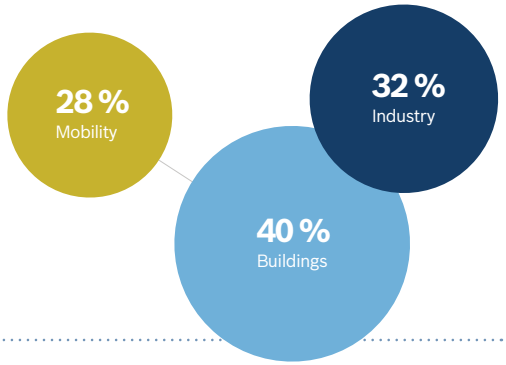


Production, transportation, modern means of communication, and even our homes all depend on one thing – a reliable and affordable power supply. Even a short outage soon makes things grind to a halt. Demand for energy is growing worldwide. To ensure a reliable supply for more people, finite fossil fuels are being complemented by sustainable sources of energy. Oil, coal, and natural gas cannot be replaced in the short term. Nonetheless, the proportion of electrical power generated from sustainable sources is set to increase in the future. Before it does, however, a number of technical issues still have to be resolved.

The Bosch Group is tackling this challenge by drawing on and combining the experience of its divisions in areas such as photovoltaics, solar thermal systems, wind power, heat pumps, and storage solutions for electric vehicles and buildings. The company has also developed innovative concepts for vehicles – for example, vehicles can now be run on both conventional and renewable fuels and the internal-combustion engine can be used in combination with an electric powertrain.



Share of global
energy consumption



Source: IEA

Greater **energy efficiency** and innovative strength can help conserve resources and protect the environment.

In the short term, the efficient use of energy is the best way to reduce global demand for energy, especially from fossil fuels. After all, power that is not needed does not have to be generated in the first place. This gives us more time to make the transition to renewable energy, transform buildings into decentralized power supply hubs, and develop electric vehicles with longer ranges. That is why the experts at Bosch are working on a wide range of solutions to make energy use more efficient. To take the example of mobility, transportation accounts for almost one-third of global energy requirements. The internal-combustion engine, which will remain the dominant powertrain for some time to come, is being further optimized. By the middle of the decade, the fuel consumption of diesel and gasoline engines will have been reduced by another one-third from present levels.

Buildings currently account for almost 40 percent of global resource consumption. Bosch has therefore developed efficient solutions for several building-related areas. Today's household appliances consume as much as 70 percent less energy than they did just 18 years ago. Modern heating systems consume roughly half as much energy as they did in the 1980s. A high level of efficiency is not a distant dream. Energy-plus houses equipped with Bosch products such as an electric heat pump, a photovoltaic array, controlled ventilation, and efficient, A+++ class household appliances demonstrate that single-family homes can generate an annual surplus of several thousand kilowatt-hours of electricity.

Just under one-third of global energy consumption is attributable to industry. In 2007, Bosch set itself the target of a 20 percent reduction of its CO_2 emissions by 2020. To meet this target, building designs, manufacturing facilities, processes, and machines are continuously checked. Potential savings of 25 percent can be achieved. And if the production system is viewed as a whole, as much as 40 percent is possible. In fact, these efficiency measures have been so successful that Bosch Rexroth now offers the solutions as an optimization service to other companies as part of its 4EE (Rexroth for Energy Efficiency) concept. Bosch Thermotechnology also offers a solution, based on the organic Rankine cycle (ORC), that uses industrial waste heat to generate electricity.

Greater energy efficiency and innovative strength can help conserve available resources and protect the environment. Using renewable energy and natural cyclic processes, we can continue to move toward an age of clean electrical energy. ●

The CO_2 networkers

Looking for ways to use energy even more efficiently

Leo Pototzky and Dirk Hartmann are clearly satisfied. “We’re on the right track.” Their success is generally not tangible. But when things go as intended, both the environment and the company benefit in equal measure. To illustrate the point, Hartmann, the chief safety engineer and GoGreen project manager at the Bosch Rexroth plant in Schweinfurt, Germany, conjures up a long list of figures on his screen. The location is nearly halfway to achieving its goal of reducing CO_2 emissions by 20 percent by the end of the decade.

Pototzky is in charge of the project, the aim of which is to cut carbon dioxide emissions at all Bosch Rexroth plants by at least 20 percent. “The project is focused primarily on the efficient use of energy in production. To achieve this, we use a special system,” he says. This system, known as Rexroth 4EE (Rexroth for Energy Efficiency), is the key element of a two-pronged strategy. The experts at Bosch Rexroth are using the system to optimize the energy consumption of machinery and systems, but they also share the findings from their own plants with end customers and manufacturers as part of a comprehensive energy-efficiency advisory service.

Leo Pototzky’s team does more than simply change a few old light bulbs and insulate buildings. They address the entire stock of plant and machinery, making use of specialist knowledge from within the company. After all, Bosch Rexroth makes drive and control technology for the mechanical engineering and process plant engineering industries. In other words, it knows precisely how individual components interact. The experts question whether all components in a system need to be used at all times or whether individual parts can be shut off. They may discover that a system can function perfectly well with a machine with a lower delivery rate or less powerful drive motors. This, in turn, saves hardware, energy, and ultimately money.

4EE: Four levers to boost efficiency

Machines and systems should run as productively as possible and use no more energy than is strictly necessary. To achieve this, the Bosch subsidiary Rexroth designed Rexroth 4EE (Rexroth for Energy Efficiency), a concept that can be applied to both the development of new machines and the optimization of existing ones. Using all available technologies, it applies four levers to significantly improve the energy efficiency of all types of machines and systems over their entire life cycle.

1

Energy system design: Systematic consideration of the entire automation process, with project planning, simulation, and advice, both for initial design and subsequent modernization.

4

Energy on demand: Significant savings can be made with energy on demand – for example, by using variable-speed pump drives or shutting off unnecessary components.

Up to 60 percent energy saving with automatic light switches
To ensure that lights come on only when needed, and remain on only for as long they are as needed, Bosch Rexroth AG and Robert Bosch GmbH use an in-house development known as IndraLogic SPS. It regulates the intensity of light on the basis of daylight and occupancy.

2

Efficient components: The installation of efficient components allows energy to be used in the best possible way, thus improving the efficiency of the system.

3

Energy recovery: With hydraulic storage-charging circuits or regenerative drives, previously unused energy is recovered and stored for subsequent use.

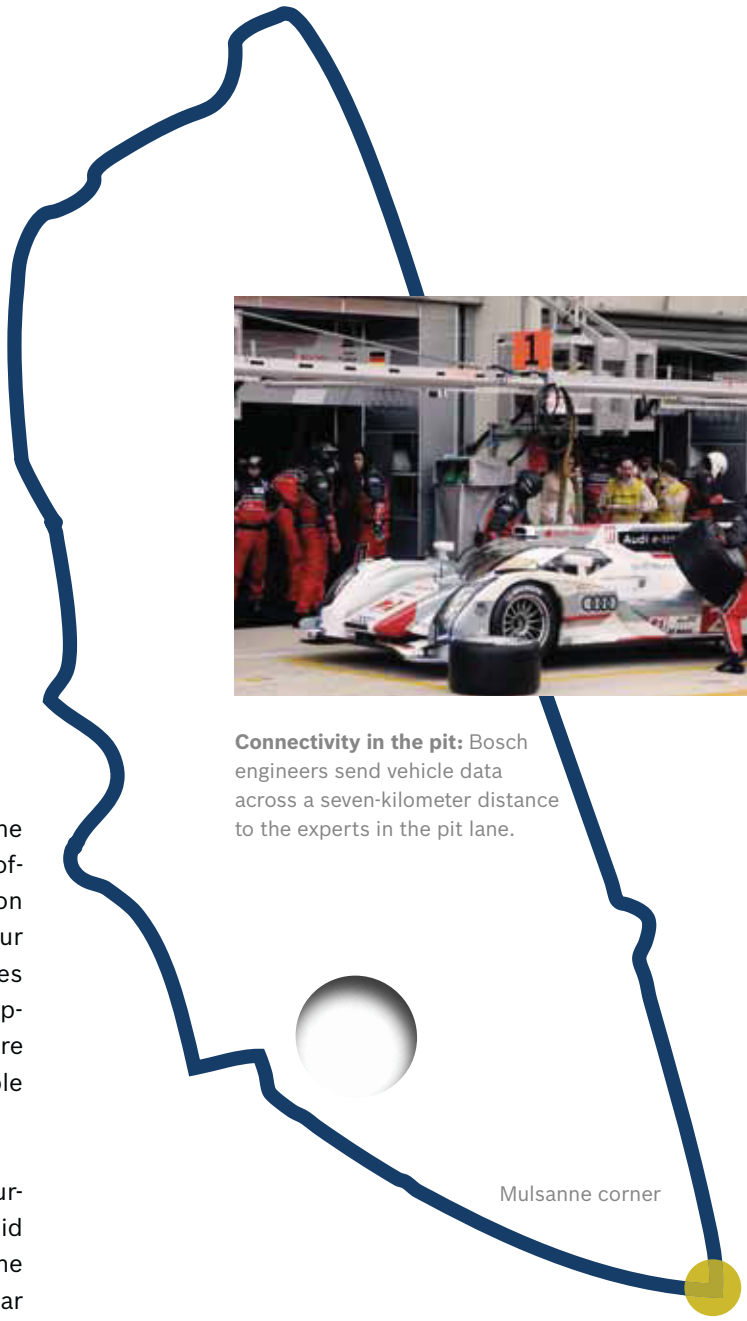
Pototzky and his team have already analyzed more than 100 different types of machines and built up an enormous wealth of knowledge. They have become real CO_2 networkers, making their extensive experience available both to Bosch associates who are advising customers on energy efficiency, as well as to numerous plants within the Bosch Group. They all work according to an established procedure. After they have taken stock of the situation, they ask a number of core questions. Which actions are appropriate? Which will have a sustainable impact? And last but not least, which are economically feasible? After all, even a major target such as reducing CO_2 needs a realistic financial framework.

For Hartmann, the redesign of large-scale grinders is a prime example of how the 4EE system can cut manufacturing and energy costs and give rise to other positive effects. In Schweinfurt, these grinders are used to file down steel profile rails to one-hundredth of a millimeter. To counteract the resulting frictional heat, high-pressure jets spray coolant on the grinding disks and metal rail. More than 140 kilometers of steel rail can be processed in this way every month. “We have redesigned the jets to make more efficient use of the coolant,” the safety engineer says. This ultimately saves so much coolant that, despite higher production volumes, there is no need for a larger coolant tank and a significantly lower delivery rate is required. In addition, there is less splashing of water. Where there was once a fine mist in the grinding shop, conditions on the factory floor have now improved markedly. “Associates were very grateful to us for that,” Hartmann says.

The workforce is playing an active part in making the project a success. Energy requirements in Schweinfurt can be reduced by around 5 percent by making sure lights and machines are switched off when not in use. In total, the GoGreen strategy has reduced CO_2 emissions at Schweinfurt by 1,700 metric tons per year. Pototzky and Hartmann are therefore nearly halfway to achieving their target. They have already set themselves new goals that extend beyond the 20 percent emissions reduction. “We are constantly discovering new things that can be made more efficient.” ●

Le Mans
Extra boost makes all the difference

Connectivity in the pit: Bosch engineers send vehicle data across a seven-kilometer distance to the experts in the pit lane.



Who brakes, wins!

A visit to Le Mans, France, is all it takes to dispel the myth that diesel engines only have a place in run-of-the-mill vehicles. Diesel engines reign supreme on this high-speed race track, famous for its 24-hour race. Without exception, cars with diesel engines have dominated Le Mans since 2006. Bosch supplies the common-rail technology, made-to-measure MS 24 control units, starters, generators, and cable harnesses for these cars.

In 2012, an Audi R18 e-ton quattro won the endurance race in Le Mans. As the name suggests, it did so with the help of an electric motor. This was the first ever Le Mans victory for a diesel hybrid. The rear axle of the car is powered conventionally by a diesel engine, while the front axle is fitted with a Bosch motor-generator unit (MGU). When the car brakes going into a corner, the braking energy is stored in a flywheel. When the driver accelerates again, two electric motors in the MGU feed the stored energy back to the front axle. Developed by Audi and Bosch Motorsport, this feature gives the racing car a brief additional boost of 204 horsepower.

And the use of Bosch technology doesn't stop there. To succeed in motor racing, the experts in the pit lane need to know at all times exactly what is going on in the car. Normally, the car radios this information to the pit lane, but this is not possible in Le Mans, as the track is too long. Bosch engineers therefore position themselves at the legendary Mulsanne corner. From there, they can pick up signals from the telemetrics system they themselves developed, and transmit this data back to the pit lane some seven kilometers away. This information provides answers to key questions. For example, are all the systems working properly? When should the car come in for fuel? The extra boost provided by Bosch technology can mean the difference between winning and losing. ●

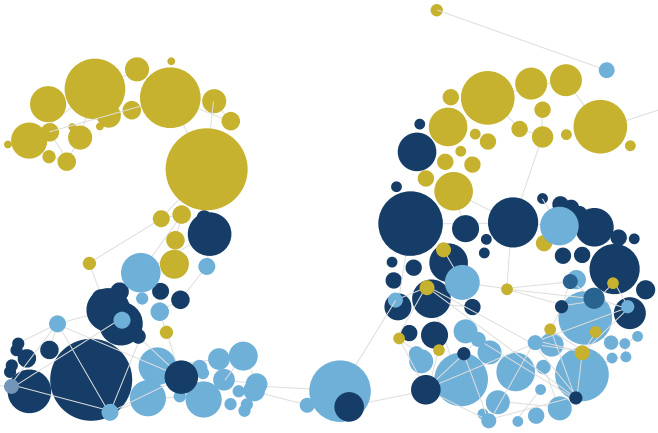
Recuperation of braking energy before bends gives a boost of **204 horsepower.**

www.bosch.com/motor-racing/

Sensors

Technology that maps the world around it

1983
the year when the idea of ESP® was first explored.



billion sensors had been produced by the end of 2012.

Spurred on by the success of the ABS antilock braking system, Bosch engineers decided to go one step further. Their idea was not only to prevent the wheels from locking, but also to develop a vehicle dynamics control system that would help keep a vehicle on course in critical situations. Bosch engineers began exploring this idea in 1983, but developing such a system proved far more complicated than the development of ABS. To slow down a vehicle in a potentially dangerous situation, the system had to have information about the actual movement of the individual tires and the position of the vehicle. The first ESP® electronic stability program went into series production in 1995. The system can prevent more than 80 percent of all skids, and as a result is being used in more and more vehicles. In some countries, it's already mandatory for all vehicles.

A yaw-rate sensor that records the rotary movements of the car around its vertical axis is at the heart of ESP®. This is just one of the components that allow the vehicle electronics to sense their surroundings. To displace mechanical sensors, which were very complicated to manufacture, a completely new process for manufacturing micromechanical chips (MEMS) was developed. Using an etching technology known as the "Bosch process," complex and oscillating structures can be shaped to an accuracy of just one-thousandth of a millimeter. Today, the Automotive Electronics division produces several hundred vehicle-specific variations of these sensors. They make vehicles cleaner, safer, more efficient, and more comfortable. Modern vehicles contain as many as fifty of these sensors.

Nowadays, Bosch sensors are not just used in automotive technology. In consumer electronics, they are used in smartphones and laptops. These devices require tiny sensors with a long service life. The smallest MEMS sensors currently produced by the Bosch subsidiary Sensortec have an edge length of just two millimeters and are less than one millimeter high. They are extremely energy-efficient in standby mode, consuming just one-hundredth of the power that is needed in normal operation.

In navigation systems and smartphones with a navigation function, MEMS pressure sensors measure minute differences in altitude, and can therefore be used for orientation in multistory buildings. MEMS acceleration sensors recognize hand movements for greater user convenience. They enable displays to be read in portrait or landscape format depending on how they are held, and make computer games even more realistic. The latest development is a triaxial MEMS magnetic field sensor that can precisely determine the compass heading by measuring the Earth's magnetic field. ●

3 x 3 x 0.9 mm
A MEMS sensor to scale.

MEMS – great advantages

MEMS (micro-electro-mechanical systems) sensors feature mechanical components such as springs, beams, weights, and membranes, all in the form of silicon structures only thousandths of a millimeter thick. Despite their size, they can reliably and precisely measure physical variables such as pressure, acceleration, yaw rate, flow rate, and gas composition. Highly integrated electronic circuits condition the sensor signals and transmit them via analog or digital interfaces to control units for further processing.

More than 1.7 million MEMS are currently produced at the Reutlingen plant every working day.

www.bosch.com/mems-sensors/

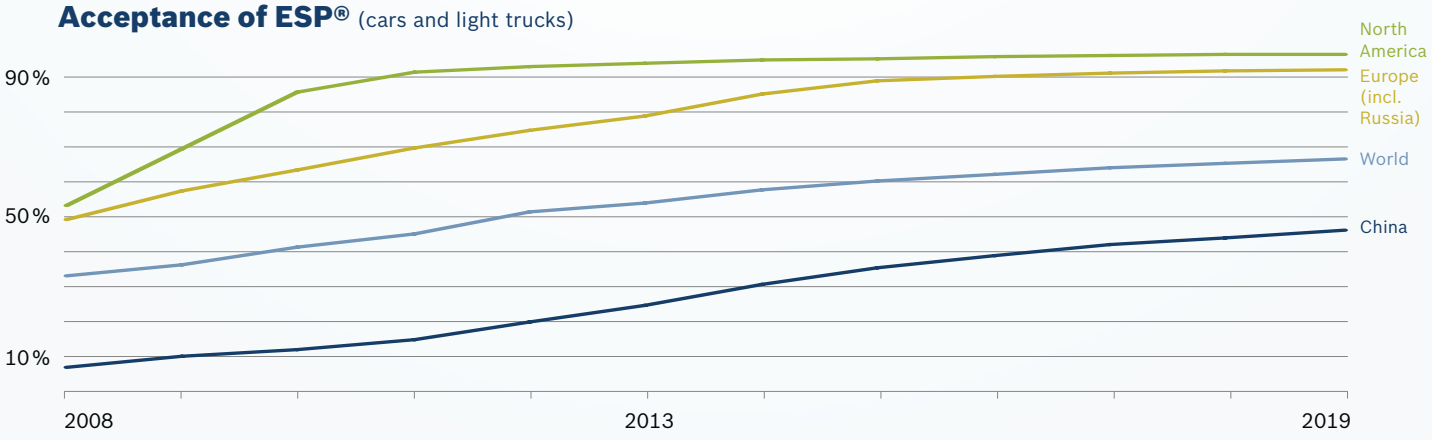
MEMS sensors recognize when smartphones are shaken or pointed in a particular direction. As microphones, they can be coupled together to minimize background noise and make speech clearer.

80 %

of all skids can be prevented by ESP®.

Source: Volkswagen AG

Acceptance of ESP® (cars and light trucks)



Communities – beneficial solutions, with a side of good fun

Joining a highly motivated group to develop your own real-life product in a focused, fast-track process is such a thrilling experience that many are happy to put in extra hours. As part of the Bosch internal open source (BIOS) project, associates from every division and country imaginable join forces in communities to create software solutions. It was with just such a project in mind that Stefan Schaupp, Diogo Fregonese, Cornelius Munz, Georg Grütter, and Dr. Jürgen Hötzel enthusiastically put their heads together to develop an app that allows Bosch Thermotechnology heating systems to be operated from a smartphone. The result is a testimony to pooling different talents – and has since gone into commercial production.

At your fingertips
The smartphone establishes a connection with the heating unit, allowing the system to be operated with ease.

Interview with Dr. Jürgen Hötzel, Cornelius Munz, Diogo Fregonese, Georg Grütter, and Stefan Schaupp (clockwise from top left)

"What we had to do was to design a suitable solution for end consumers. That's when Georg came up with the idea of developing an **app."**

Turning up the heat by tablet: if there's a cold spell, the heating can be fired up remotely, so that the house's occupants find everything warm and cozy on their return.

How did the BIOS project come into being?
Schaupp: I headed up Project 66, which preceded the BIOS project. Back then, our goal was to make software design more efficient. One way for Bosch developers to quickly find new approaches and solutions that are beneficial to the company is to encourage them to network across divisions. There had never been anything quite like that at Bosch before. That's how BIOS was born.

Grütter: We started laying the groundwork in August 2009, and in March 2010 we became an official Bosch project.

Fregonese: The creation of BIOS was driven by associates. Originally, it was a real experiment. Now, associates come to us with their ideas and visions, and our steering committee follows a clearly defined process to determine whether the concept merits the setting up and financing of a new community.

Mr. Munz, how did you come to join BIOS?
Munz: I read on the Bosch intranet that there was a group devoted to simplifying applications. That piqued my interest, especially as I enjoy working on smartphone apps. What really grabbed my attention was that under the project's umbrella you can home in on a single aspect and contribute to finding a solution. So, in mid-2010 I contacted them.

What made you think of developing a heating app?
Grütter: Initially, we planned on designing a special application for engineers at Bosch Thermotechnology. That's Jürgen Hötzel's division. We met while working in research and have known each other for years now. One day, he suggested that we come up with a solution. He was the one who got the ball rolling.

Hötzel: That's true, but we weren't starting from scratch by any means. Georg Grütter and his colleagues had already laid a solid foundation – the all-important interface with the control system, which is the heating unit's brain. What we had to do was to design a suitable solution for end consumers. That's when Georg came up with the idea of developing an app.

BIOS – Got the ability? Got the job!

The "Bosch internal open source" (BIOS) project takes its cue from internet networks and open source software such as Linux, Mozilla, and Android. The source code of these programs – the core set of instructions to be executed by the computer – is accessible to the public. As a result, anyone can contribute to further developing the software or modify it to suit their specific needs. For Bosch associates interested in programming, BIOS is a passport to the source code of those applications that are regarded as having untapped potential.

BIOS projects are devoted to all kinds of control systems, driver assistance systems, and apps for end consumers, to name a few. Derived from R&D work, the tasks addressed are broken down into smaller subtasks, for which participants seek appropriate solutions. This is the basis for the communities that often comprise a good dozen members but can also bring together over 100 participants from around the world. Everyone participates voluntarily and makes a personal decision about how extensively and for how long they want to be involved. What everyone shares is a passion for collaborating in the hunt for solutions to software challenges, as well as the desire to take the initiative as part of an open online community.

But why heating specifically?
Grütter: I had worked on heating systems in the past and it bothered me that many of the settings were so complicated. I asked myself, can't we use today's technology to make things simpler? That's why we took on the most complex piece of equipment. Instead of spending almost a minute clicking and fiddling with knobs, you can now get the same results effortlessly in a few seconds using our app.

Is this more than just a gimmick – is there a market for the app?
Hötzel: Yes, of course. With our app, you can regulate your heating by remote control without needing to go down into the basement. One click is all it takes. And because operating it is so simple, it makes saving energy easier, too.

“It took us less than a year from initial idea to market-ready product.”

When you go away for a few days, the heating can simply be turned down. What’s more, the app also acts as an early warning system if there are any system faults, so you can respond quickly. If there’s a cold spell, the heating can be fired up remotely and you return to a warm, cozy home. And don’t underestimate how proud you’ll be to show guests what a high-tech home you live in.

Doesn’t the Thermotechnology team feel that as non-heating specialists you’re stepping on their toes?

Grütter: Initially, there were some reservations but it soon became apparent that this idea works. That generated acceptance.

Hötzel: The response went beyond mere acceptance. The product managers put a lot of faith in us and trusted us to get the job done in time. That in turn motivated us even more.

How quickly did you manage to get the product ready for market?

Grütter: It was unveiled at the Frankfurt trade show in March 2011. That means it took us less than a year from initial idea to market-ready product.

Munz: Which is not to say that there weren’t some frantic moments along the way...

Fregonese: But the community was committed to completing the job on schedule. And that’s what we did.

Doesn’t that put a lot of pressure on a network of this kind?

Grütter: Yes, it does. But that is also what spurred us on.

Hötzel: We really got the feeling that there was keen interest in our progress right up to the board of management. The executives could hardly wait to see if the experiment would succeed. This interest provided us with the room to maneuver and the budget we definitely needed.

Schaupp: The fact that we succeeded gives BIOS a big boost. It quickly proved that a community with its pool of skills is able to develop a workable prototype within a short time frame.

You give the impression that the experience of succeeding was more important to you than the product itself...

Grütter: It’s really all about voluntary involvement and personal initiative. That’s what really motivates the participants. And yet, what’s interesting is that collaboration is very disciplined and effective.

And what do your supervisors have to say about it?

Munz: Fortunately, my supervisor responded positively to the idea. With her support, I was able to spend 10 to 20 percent of my working hours on this project.

Fregonese: Ultimately, that was also the pivotal question for us – what has to be put in place to allow people like Cornelius Munz to join a community? It’s also the reason why, with BIOS, we created a system that covers a portion of the participants’ salaries for the duration of a project.

Munz: Even so, it can’t work without supervisors supporting it. Only when managers recognize that this type of engineering work benefits the company as a whole can individual associates split their time between their usual role and a BIOS community.

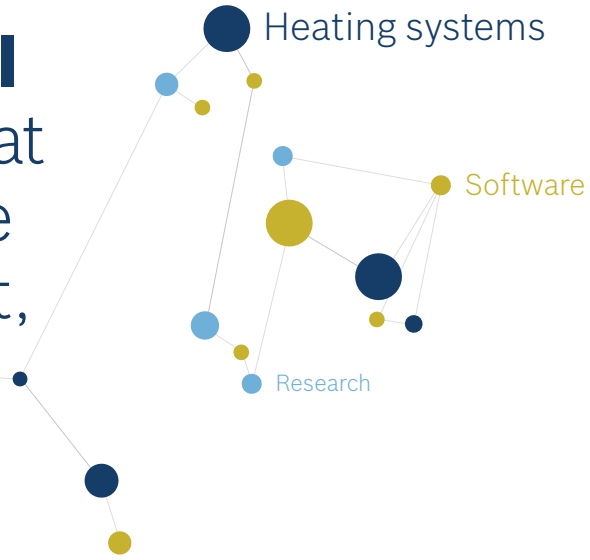
Schaupp: The success of this project has started to change executives' thinking. They have seen that associates working in this way also produce impressive results for the company. Without this mindset, projects like BIOS wouldn't get off the ground at all. We believe that these interdisciplinary and intercultural networks offer us enormous potential we can leverage.

Apart from the double workload, what do you get out of it?

Munz: For one, there's naturally a sense of achievement in being part of a successful initiative. In addition, I learned a range of things over this period that will help me do my job better. After all, I also develop apps in my regular job, and the insights I gained through BIOS have made it that much easier.

Hötzel: On top of that, there's the success of the app itself, which has now sold in the thousands, often in conjunction with a corresponding new heating system from Bosch Thermotechnology. Its success has surpassed our wildest dreams – and that's something to be proud of. ●

"It's really all about **voluntary involvement and personal initiative.** That's what really **motivates** the participants. And yet, what's interesting is that collaboration is very disciplined and effective."



Learning from users
User Experience (C/UX)

“I don’t really know what this display is for.” Annkathrin looks quizzically at the dashboard of the electric car. The 40-year-old has been invited to the C/UX department as a test customer. She usually only drives when absolutely necessary. Technical gimmicks are therefore not high on her wish list. Flashing displays and warning tones with no immediately identifiable cause make her more nervous than anything else. And this electric car features plenty of these. So many things are different and confusing. “Is the car even on?” She turns back to the round instrument labeled “Energy.” “What should a display like this tell you?” the project manager Stefan Knoll asks. “Erm, how many miles I can still go?” Annkathrin asks tentatively.

Sebastian Tietz, Dominic Winkler, Frieder Klöpfer, Claudia Rummel, Sandra Schoenrade, Mathias Zapke, and Demet Sirim (from left to right) collect suggestions from users for the development of new products.

This type of conversation is commonplace in the department with the mysterious name C/UX. UX stands for “user experience.” “We identify the needs and wishes of users and factor them into product development,” says Dr. Peter Schnaebele, who is in charge of the department. “We aim to design products that spark enthusiasm rather than simply satisfy. This fascination is the basis for a successful product.”

Schnaebele and his team are real pioneers at Bosch. As well as engineers and IT specialists, the C/UX team includes psychologists, user interface designers, prototype specialists, and industrial designers. Working from a nondescript factory building in Leonberg, Germany, they all help to develop innovative solutions. They explore what provokes positive or negative emotions when using a device.

The team in Leonberg works in the area where technology, market opportunities, and user expectations overlap. The customer is at the heart of their deliberations – in other words, the people who use products and services every day. These people may be drivers or packaging machine operators. Test drives, like Annkathrin’s in the electric car, provide an insight into what users expect from a product. In choosing test drivers, the experts use agencies, internet forums, and other interest groups to address people with very different backgrounds.

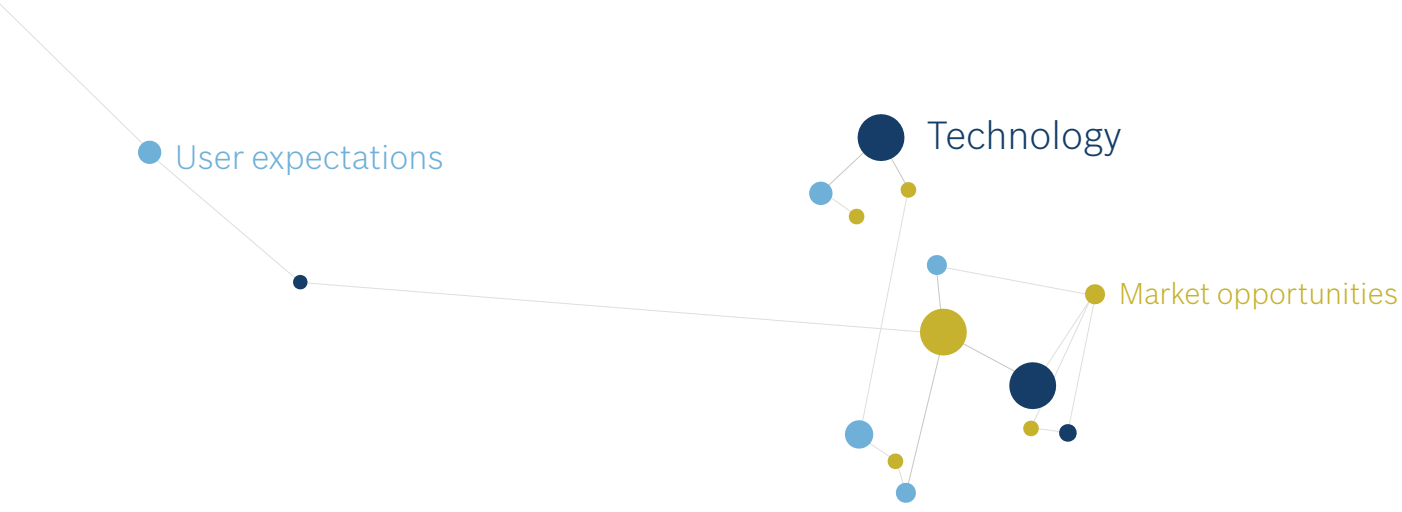
Take Christian. Unlike Annkathrin, he is an experienced driver and quickly gets to grips with the electric powertrain. He shows the Bosch experts in the car with him where he would like the speedometer and the other displays to be. Extreme differences of opinion on the same issue are very helpful for the C/UX team. That is why they were keen to meet drivers who do not match the average profile. For example, they have also observed

Ideas are put onto paper quickly and easily.

and interviewed avid video gamers and non-drivers – people who at first sight appear to have nothing to do with electric vehicles. “These ‘extreme users,’ as they are known in the department, often provide the most valuable insights,” Schnaebele says.

In the initial stages, it is not easy to predict what customers expect from a new product. What could be the next new function, device, or service? Schnaebele and his international team try to answer this question by asking more questions and observing everyday life. During the winter months, for example, many cyclists wear gloves. For handlebar computers, this means that small buttons may look stylish, but they are not exactly practical.

Once the issue has been identified, the specialists use simple tools to quickly build a prototype. “We sometimes use foam, cardboard, or paper for our first attempts and then go back to the potential users to see what they think,” Schnaebele says. Visualization is vital: “A picture says more than a thousand words.”



Can it also be operated with gloves on? User-friendliness is key. The team from C/UX draws directly on customer experiences.

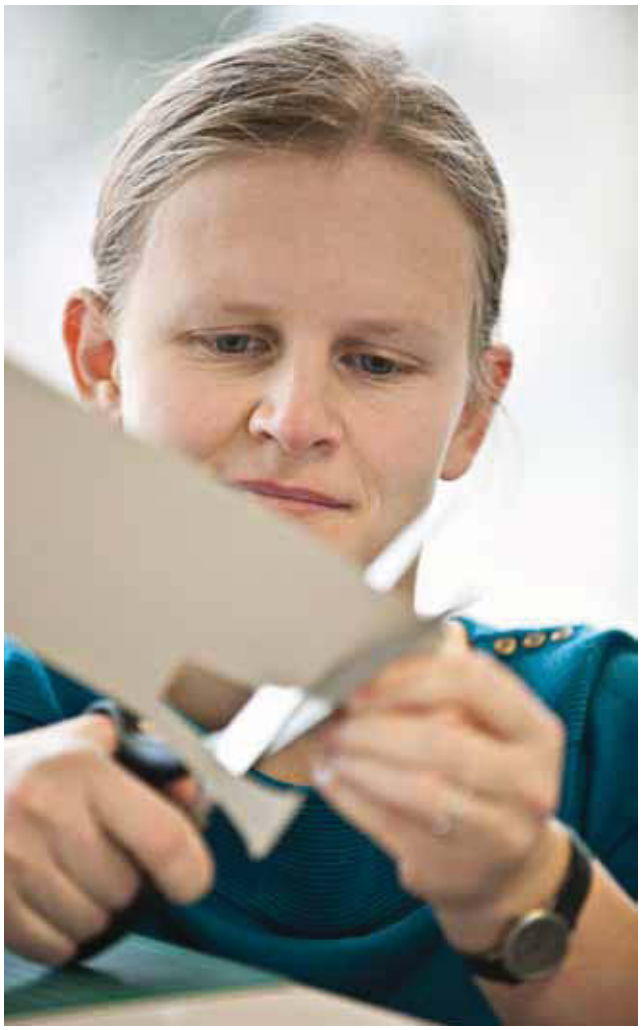
The feedback delivers valuable insights. Knoll shows Barbara, another test customer, a model of a new dashboard for an electric car. A landscape is projected onto the wall to give the young woman the impression that she is actually driving an electric car. “I’d rather have this information up here,” she says, as she concentrates on the “road.”

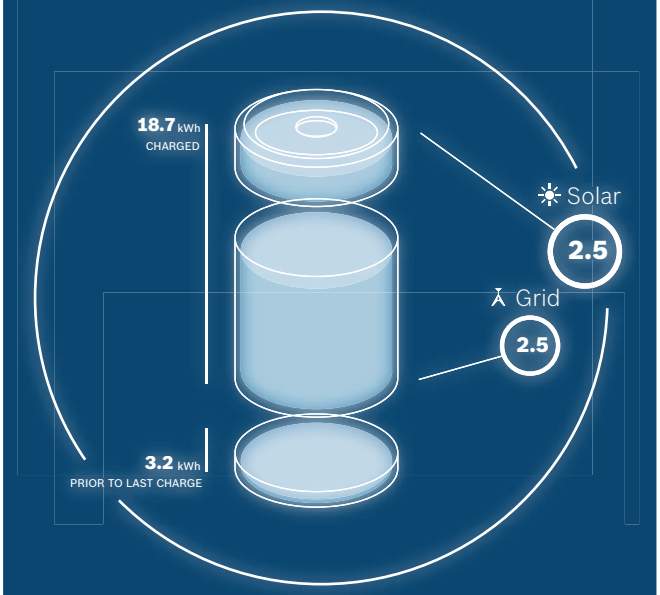
In principle, the results should be available quickly. After just a few months, the team should have a clear idea of whether or not a product works. If the idea is also well received by the Bosch divisions, the experts then use the prototype to make a product ready for series production. The control unit button, which can also be operated by cyclists wearing gloves, is now a reality. E-bike specialists at Bosch introduced this innovation in summer 2012.

The test customer Marc is also pleased with the new display for the electric car. “You’ve done a great here,” he says. When he gets in, the car greets him with a friendly “Good morning, Marc.” Important information is projected onto the windshield. The energy consumption, range, and location of the next charge spot are all shown. But the system can do much more than that. It also measures the distance to the vehicle in front, and calculates how much energy is needed to reach the next traffic light. The C/UX team has also come up with an idea for the navigation system. The more Marc uses the car, the more destinations the system recognizes. It then suggests the least congested routes – and indicates shopping opportunities along the way. On Marc’s wedding anniversary, for example, it would also flag up a flower shop on the way home... ●

“We sometimes use foam, cardboard, or paper for our first attempts and then go back to the potential users to see what they think.”

Ulrike Johannsen





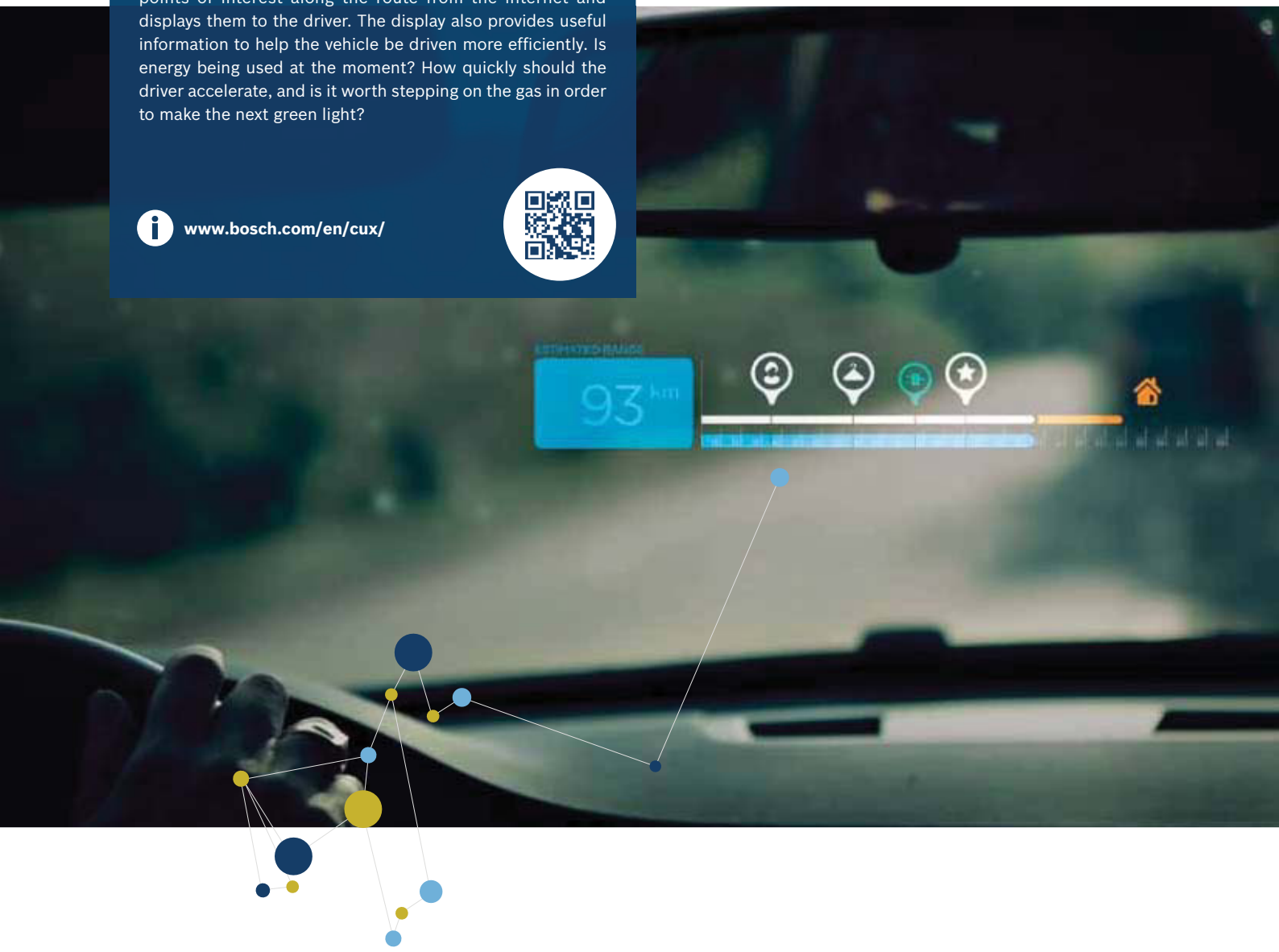
Head-up display

The windshield is used as a networked projection surface. It displays information, such as the distance to the car ahead, directly in the driver's field of vision. The on-board computer gathers data from many sources: it takes information about points of interest along the route from the internet and displays them to the driver. The display also provides useful information to help the vehicle be driven more efficiently. Is energy being used at the moment? How quickly should the driver accelerate, and is it worth stepping on the gas in order to make the next green light?

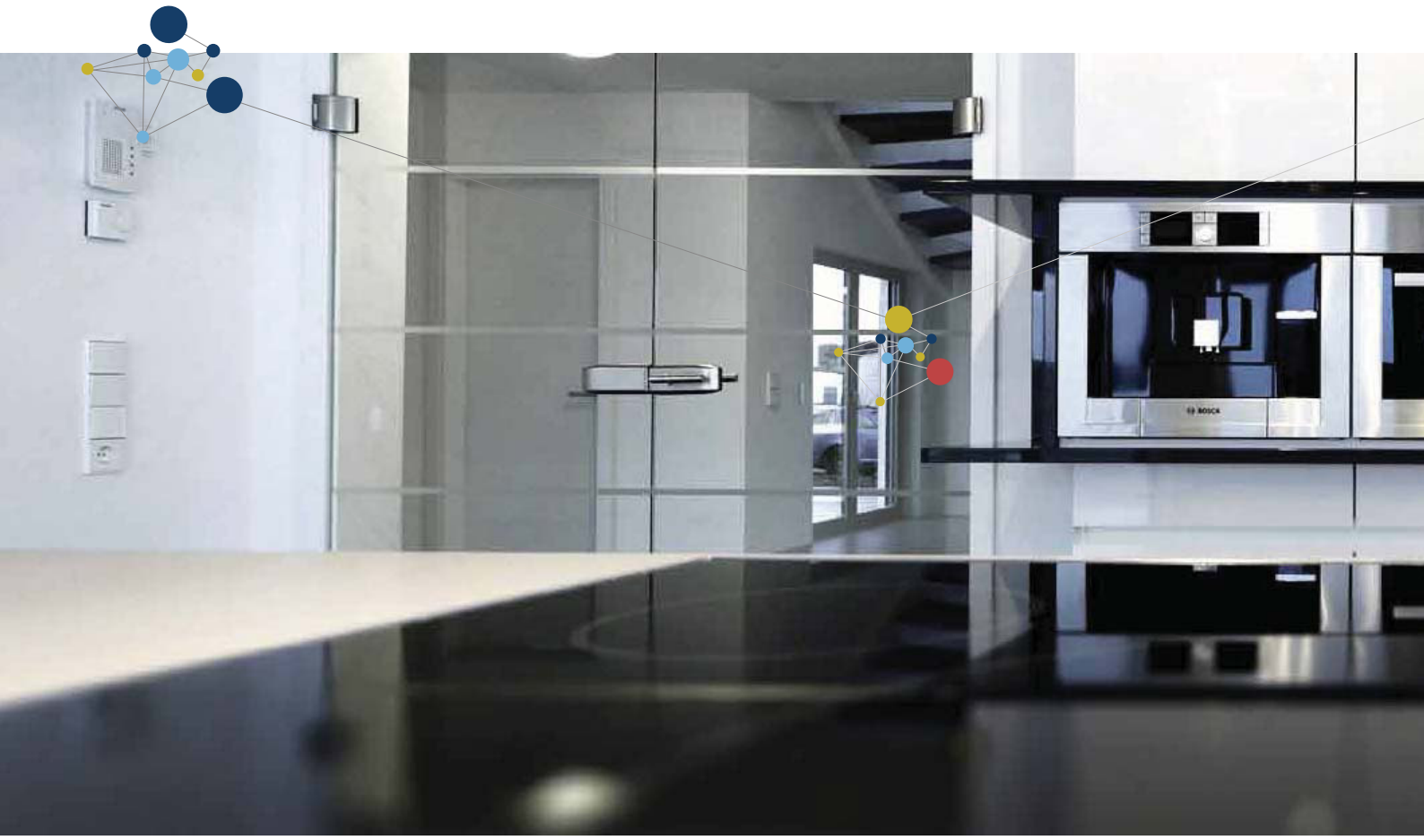
www.bosch.com/en/cux/

"At the heart of their deliberations are the people who use a product or service every day."

How far can the vehicle still go? What errands can be done along the way? Relevant information is projected onto the windshield.



Buildings
More than four walls and a roof



The collector on the roof uses the sun to heat water for the occupants. It is supported by a heat pump that uses the ambient air to heat the rooms. There is also an oil-fired heating system in the basement, but this only kicks in when it gets really cold. This combination of three different technologies to heat a building, known as „Tritherm," was developed by Bosch in 1976. The experience gleaned from this system was incorporated into the development of the energy-plus house, which now feeds more power back into the grid than it consumes itself. This is just one example of the advances that have been made by combining different technologies for use in buildings. The results make the lives of the people who use the buildings more pleasant, safer, and – also important – less expensive. In large building complexes such as airports, stadiums, or office buildings, systems developed by Bosch Security Systems ensure that dangers such as fire or smoke are recognized in plenty of time. People can therefore be warned and protected, countermeasures initiated, and emergency exits opened. Bosch social alarm and telemedical monitoring systems play a key role in ensuring that the elderly and chronically ill are cared for, but are still able to remain in familiar surroundings for as long as possible. They can enjoy their independence safe in the knowledge that they will receive help quickly in the event of an emergency. This is an increasingly important consideration in light of the age-related demographic changes that are happening in many countries. But they are not the only examples of connectivity. There are also connected household appliances and heating systems that switch themselves off when the cost of electricity is especially high or that can be controlled remotely.

Hello electricity meter,
this is the dishwasher

A dishwasher connected to the internet may seem like a gimmick, but the experts at Bosch und Siemens Hausgeräte GmbH (BSH) were keen to find out more. They carried out a practical trial for a research project, developing a dishwasher with an integrated wi-fi interface. The interface connects the appliance with a smart electricity meter, which registers the household's electricity demand. The meter also has access to current electricity prices. If the user selects the "smart grid" option on the dishwasher, these two sets of information are analyzed and compared. The result is that the appliance does not start until energy is available at an especially low price on the grid. In other words, the best possible time for consuming electricity is selected. Household appliances account for roughly half of a household's electricity bill. The European Union wants more than 80 percent of all households to be equipped with smart electricity meters by 2020. The customers who took part in the 16-month field test were impressed by the "smart grid" option.

The BSH experts are now working to refine this concept. While the technology is ready to go, the political and economic framework conditions for a wide-scale smart grid are still lacking. However, Bosch can already offer its customers interactive support, completely independent of the electricity price. On the myBosch service platform, buyers of Bosch products can already take advantage of a full service offering for their household appliances – from a digital operator's manual to many additional pieces of information, user tips, and other extras. myBosch can be accessed on the www.bosch-home.com/de homepage, and will be available as a download for iPad and iPhone from summer 2013. The website is a logical continuation of the company's comprehensive service mindset.

An **energy-plus house** generates more electricity and heat than it consumes.

And this is only the beginning. In the future, building installations connected to a decentralized cogeneration plant will be transformed into power supply hubs that help cover a building's own energy needs, as well as those of surrounding buildings. Energy that is not needed is stored in the building for later use. Intelligent networks of local power stations such as these, managed via an internet platform provided by Bosch Software Innovations, will be an integral part of the power supply network of the future. With the energy-plus house, energy storage facilities, solar technology, heat pumps, and many other products and services, Bosch is already on the right path. ●

www.bosch.com/energy-plus-home/

Automated driving Safety through connectivity

Interview with **Dr. Sven A. Beiker,** executive director of the Center for Automotive Research at Stanford University (CARS), and **Dr. Jan Becker,** senior manager of the Bosch Research and Technology Center North America in Palo Alto, California. Their research focuses on automated vehicles, driver assistance systems, automated driving, and robotics.

Despite all the technology deployed in vehicles today, one risk factor is still present: the human driver. Human error causes 90 percent of all accidents.

At first glance, the solution seems perfectly simple: if people let technology take the wheel, the dream of accident-free driving will become reality. Building "automated vehicles," however, has proved a tough challenge in today's real world of heavy traffic. But human drivers are already a step ahead if they can be alerted in time to potential hazards or errors of judgment. In this respect, automotive technology coupled with the increasing sophistication of computers has advanced by leaps and bounds. Vehicles already communicate with their surroundings in a variety of ways. They gather information about obstacles ahead, outside temperature, or road conditions.

But that's just the start. The radius within which cars can gather information is expanding all the time. Early tests involving vehicles that warn each other of hazards, traffic jams, or bad weather are already in progress. To do that, the cars of the future will need ever better connectivity to the internet. It is quite evident today that the road to safe vehicles leads to closer connectivity with other vehicles and with the surrounding environment.

www.bosch.com/en/Car-to-X

Mr. Beiker, how are you connected with Bosch? How do you collaborate?

Beiker: Bosch is one of the founding members of CARS and was instrumental in shaping its work from the very beginning. The exchange is not only very good on a personal level; Bosch also plays an active official role. One of the best examples? The legal aspects of automated driving in the United States. Jan Becker said three years ago, you're working on the technology now, but take a look at product liability in the U.S. and the current traffic code. Bosch has always understood how to set the right tone when formulating suggestions and how to avoid stepping on the university's toes. Especially in this area, setting up a new research direction that had never been considered before called for sensitivity of a technological and personal nature. It's good that Bosch inherently assumes a neutral and integrative role.

Becker: It simply made sense to bring up the subject of the legal aspects at this point in time, and Stanford is the perfect place for it. There is a strong law school with skilled specialists who are open to offbeat issues. Having said that, it's also important for us not to have issues dominated solely by Bosch. Notably the legal aspects have a social relevance that goes far beyond the interests of any one company. You can only do that with broad-based collaboration.

Big things that start in garages have a long tradition at Stanford...

Beiker: Right. And we really do have a garage here where we carry on that tradition. Sometimes we have up to 180 people in it. Stanford has the advantage of being part of Silicon Valley, which attracts people from all over the world and has a history of success behind it. It's where innovations and trends are born. You meet a huge number of brilliant, innovative, interesting people here. Stanford is interdisciplinary. Stanford also views automotive issues – especially those that go beyond mobility issues – as the new technology, while computer science is considered well established. This is an area where the university aims to train young talent who combine traditional engineering skills with computer and software expertise.

One of our current projects, in which Bosch has also expressed an interest, is the connected vehicle – connected not only to other vehicles, but also to the infrastructure. Another issue we may be tackling with Bosch and other partners is driver distrac-

Testing and troubleshooting: as part of the CARS project, experts road-test new solutions.

CARS

CARS is the interdisciplinary automotive affiliates program at Stanford University. The vision of CARS is to create a community of faculty and students from a range of disciplines at Stanford with leading industry researchers to radically re-envision the automobile for unprecedented levels of safety, performance, sustainability, and enjoyment. Its mission is to discover, build, and deploy the critical ideas and innovations for the next generation of cars and drivers.

tion and driver attentiveness. Here, too, it makes sense to hold small-scale discussions before taking it to a wider audience. Our project, CARS, is a partnership program, and as such it's an incubator for topics that wouldn't find a home on their own. What's special about CARS is that we have 19 partners on an equal footing, which also means getting to know 19 different corporate cultures. Within these companies, there are also an indefinite number of personalities – that's an exciting mix, and we stay neutral within it.

To switch to the topic of automated driving: what challenges will we face next?

Beiker: I hope that we'll make more headway in vehicle connectivity. I am personally convinced that it is more difficult to make an automated vehicle which is incapable of exchanging information with other vehicles in its vicinity or with the infrastructure than one that is already connected to other cars. This concerns the technical side more. On the business side, I hope that we'll be able to better understand what customers actually want, and what they're really willing to spend more money on. Would it make sense to set aside one lane on the highway just for automated vehicles, and then perhaps charge people a dollar per ten miles to use it?

The human factor surely plays an important role...

Yes. How does someone actually feel in an automated vehicle? Do they trust it more than they would trust a taxi driver? How much information and training will people need? What aspects are likely to meet with rejection?

Technologically, it's possible for a car to drive itself, but in contrast to commercial aircraft and pilots, what we're dealing with here is users or drivers who have no special training, who don't read the manual, who don't check the systems before each

"If the automobile were re-invented today, everything would be completely automated."

Dr. Sven A. Beiker (left) and Dr. Jan Becker
The two German engineers work at Stanford on their shared vision: a future in which drivers only do what they like doing, and technology takes care of the rest.

journey to make sure the sensor is working correctly and whether the system they use is already permitted on the route they want to take. Instead, they just get in and expect everything to work.

What might the major obstacles be?

Beiker: If we put this technology out there prematurely and accidents happen, I'm afraid there would be a huge outcry in the media.

In addition, I see a challenge for us in bringing together people from the automated driving research community on the one hand and the vehicle communication community on the other. What we currently call automated driving goes by every name imaginable in the wider world, from automated, driverless, and self-driving all the way to robotic vehicles – which of course brings with it a huge number of associations. People generally have the expectation that this will mean simply typing an address into their navigation systems and pressing a button, and the car will drive itself there. This may be possible someday, but not for decades. And it will look different than we picture it today. I believe it will happen on roads that have been sealed off or specifically designed for this purpose. That might be a dedicated lane on a highway or freeway or it could be certain regions or cities. Maybe you'll have a special parking garage where you hand in your car at the entrance and it drives itself in.

Becker: In the end, we'll have to find the right balance. We have to let drivers keep doing the things they enjoy doing, and take over the things that are irksome – such as sitting idly in a traffic jam.

So it will be a gradual transition and not a sudden one?

Beiker: Yes, I think so. An evolution, not a revolution.

Is the human factor an obstacle to a rapid market launch, given that the technology exists already?

Beiker: No. I would say the present system is the obstacle. Imagine you were to invent the automobile today, with all the technology we currently have. I'm absolutely convinced you would come up with a traffic and transport system that is fully automated. This is essentially what you often have in a manufacturing environment, in factories – the automated conveyors that deliver parts to the assembly line. We could already create something like this, but the problem is that you have 250 million cars on the roads in the U.S., all of them driven by people, and these people don't always obey all the traffic rules. We have learned to cope with this, but to program this into processes for an automated system would be extremely difficult. My opinion is that the truly great challenge will be achieving the right balance between automated and human-controlled vehicles. ●

“Those who do nothing will experience a revolution.” How the internet of things and services is transforming the world

Interview with Professor Dr. Elgar Fleisch, University of St. Gallen (HSG), Switzerland

In the future, more and more devices and systems will be capable of sending and receiving data via the internet. For example, electric cars will automatically reserve a charge spot, and buildings will independently be able to calculate their energy requirements and cover them accordingly. This will give rise to completely new services which will transform people’s daily lives. This is what we mean when we speak of the “internet of things and services.” By 2025, an estimated 50 billion appliances and systems will be able to exchange data and synchronize with each other without any human input.

Professor Elgar Fleisch has been researching the economic impacts of this development for more than ten years. Among other things, he is the scientific head of the “Bosch Internet of Things and Services Lab – a Cooperation of HSG and Bosch”, an innovation lab that was established at the University of St. Gallen, Switzerland, in 2012.

“What Bosch contributes to the search for new solutions is a spirit of **openness.**”

One example of networked things and services: as a systems integrator, Bosch develops innovative service networks for e-bike riders.

How would you describe the internet of things and services?
The internet we have known up to now has been a platform for direct exchange between people. But now that we can build small computers into everything, sensor technology and small IT components have made it possible for any object to become part of the internet. And thus things that were once mute and inanimate can now take part in the grand concert we call life. This is the internet of things and services.

Can you give some more concrete examples?
Sure. Take pharmaceuticals packaging. Today all we can see is if there is medicine inside the bottle or blister pack. This is usually accompanied by a detailed package insert which many people don’t understand. In the future, the packaging will be able to tell us if the contents are original or counterfeit. It will contain a treatment plan, warn if there is a danger of overdosing, contact the doctor to order a refill, and even ask the patient, “how are you today?” Even a simple soft drinks bottle could share much more information with its consumer. Nearly invisible IT components open up countless possibilities for communication between an object and the rest of the world.

If products’ characteristics are going change so much, what will the industry need to do differently?
In the future, we are going to have to think more about services. Can a machine part be connected with the internet? How can internet capability generate additional services for customers? As you can see, we have to think beyond just the product. This will lead to changes in design, the manufacturing process, customer relations, and in the long run, the entire business model. So companies have their work cut out for them.

Are companies prepared for this change process?
Many companies are definitely aware that a reorientation is necessary. Nonetheless, it appears that very few are addressing the topic in a coordinated way. But this is also difficult, since in many areas there currently isn’t an obvious market for these new concepts. At the same time, companies have to continuously test the market, be smart enough to try new things, and be quick to start work on a concrete product. As I see it, hiring more engineers is not the answer. What will be crucial is having enough in-house computer-science expertise. In this regard, many product- and hardware-oriented companies have a lot of catching up to do.

What role is your institute at the University of St. Gallen playing in all this?
Here in St. Gallen, we’ve been working on this subject for twelve years now. Our research is aimed at finding out what areas of application there could be for the pharmaceuticals industry, banks, energy suppliers, automakers, mechanical engineers, and many more. You could call us a “research subcontractor.” This

"Devices automatically **network** with each other without the consumer even being aware."

allows us to generate ideas and run small pilot projects. We lay the foundations, and others build on them.

What type of partners are you looking to collaborate with?
We need companies that are open-minded and willing to approach new ideas objectively. Without this spirit of openness, it just doesn't work. The innovation laboratory we established with Bosch is a prime example. What Bosch contributes to the search for new solutions is a spirit of openness.

But companies could easily conduct experiments on their own...
Sure, but as a university no one will judge us too harshly if we occasionally try something off the wall and fail. A company always has to be careful that it doesn't damage its valuable brand through such attempts. So it's more difficult for them to be happy-go-lucky in their approach, while we are not held back by such concerns.

Wanting to breathe life into soft drinks bottles with computer technology – that's also pretty off the wall, isn't it?
Admittedly, the initial main focus is not going to be on solutions for the end consumer. Right now, experts are more concerned with other questions, such as how manufacturing processes can be improved on an industrial scale. Just think about products that use an RFID chip to monitor the manufacturing process and report on its current status. Condition monitoring – that is, the automated web-based checking of machines and equipment – is already a reality.

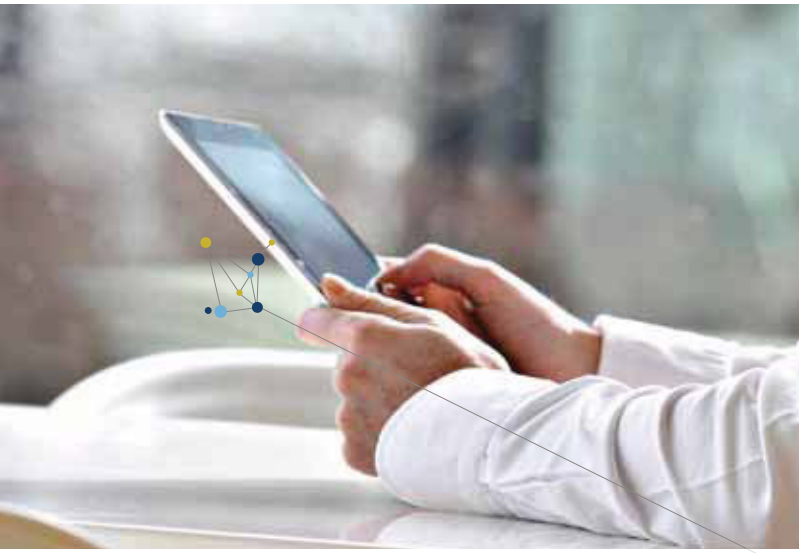
When will consumers start to experience the internet of things and services in their daily lives?
That's an interesting question. Computers are becoming so small that they're no longer visible in products. Devices automatically network with each other without the consumer even being aware. Many current applications have already become so familiar that we don't even give them a second thought. Some prominent examples of this are ski passes, train and plane tickets, and modern entry systems for office buildings, factories, and stadiums.

It all sounds like a field that leaves some room for deceptiveness. When will this become a major field with an economic impact?
When it comes to security, it's already a major field. It's not through successful products like the iPhone or iPad that the internet of things and services will become visible. Many applications simply run unseen in the background.

Dr. Elgar Fleisch is a professor of technology management and director at the Institute of Technology Management at the University of St. Gallen (HSG).

After graduating from the Institution of Higher Technical Education in Engineering, he studied business information technology at the University of Vienna. In 1993, he completed his doctorate at the Vienna University of Economics and Business on the subject of artificial intelligence in production scheduling. In 1994, Elgar Fleisch started researching business networking at the University of St. Gallen's Institute of Information Management, and in 2000 he was named assistant professor of business administration.

Today Elgar Fleisch conducts research in the areas of operations management and the business aspects of ubiquitous computing. He has also co-founded a number of successful university spin-offs, which he continues to supervise. The results of his research activities have been published in more than 250 scientific journals and books.



“Digitalization will cause many areas to change or disappear completely, as ever more hardware becomes superfluous.”

From an economic point of view, we’re going to see considerable increases in value and reductions in cost as a result of this. But all in all, the internet of things and services is an evolutionary process that will take place gradually over the next few years. Companies that don’t do anything, though, will experience it as a revolution – and find they’re suddenly out of the game.

How will this revolution play out?

In the future, nothing will be possible anymore without computer scientists. If you want to recommend a secure career path to your children, tell them to study computing. Digitalization will cause many areas to change or disappear completely, as ever more hardware becomes superfluous. A classic example of this for me is the travel alarm industry. When did you buy your last travel alarm? Or think about how many functions are combined in a satellite navigation device. And even these devices are going to be made obsolete by smartphones. Companies would do well to pay attention to these trends. In my view, Bosch is right to go on the offensive in this respect.

Doesn’t the internet of things and services also require a proper infrastructure? Will a country fall behind if it doesn’t invest in this early enough?

I wouldn’t go so far as to say that countries that don’t have an existing infrastructure have no chance of keeping up with those that do. Many emerging markets are currently demonstrating that they’re capable of gaining ground by simply leapfrogging over an entire generation of technology. However, it will be dangerous for those countries that steadfastly refuse to develop technologically, preferring instead to maintain the status quo. There, existing industrial structures might one day just collapse because they haven’t kept pace with everyone else.

So the internet of things and services won’t supplant industry as we know it today?

No, actually it will be an important part of it. Even now, we can’t imagine any part of a company operating without the internet. It offers still undreamed-of possibilities, and these must be exploited. Companies that can’t do so on their own should collaborate with others to make this possible. Otherwise, they’ll be left behind. What’s important is the willingness to try new things. This is one of the key characteristics of companies like Bosch. The internet of things and services offers them an enormous opportunity.

What would you advise Bosch to do in order to exploit this opportunity?

Bosch has demonstrated in the past that it knows how to cope with big technological changes. The advent of electronics in vehicles is an example of how the company turned a technological development into a very successful business. When it comes to the internet of things and services, I would advise against setting up overly large units. Over the next two to three years, it will be much more important to run pilot projects in every area of the company, in order to learn as much as possible.

Isn't that taking a step backward, a return to the principle of trial and error?

Yes, to a certain extent. For this reason, it shouldn't be just a single part of a company that concerns itself with this subject. If all a company's divisions were to start focusing on the search for new products and services that make use of the internet of things and services, a lot of ground would be covered. And the chance for success would be greater.

So in other words, try it and see?

Exactly. With the same curiosity and perseverance we expect from our students. The way forward is clear – we just need to forge ahead with determination. ●

Research at Bosch
Globally connected

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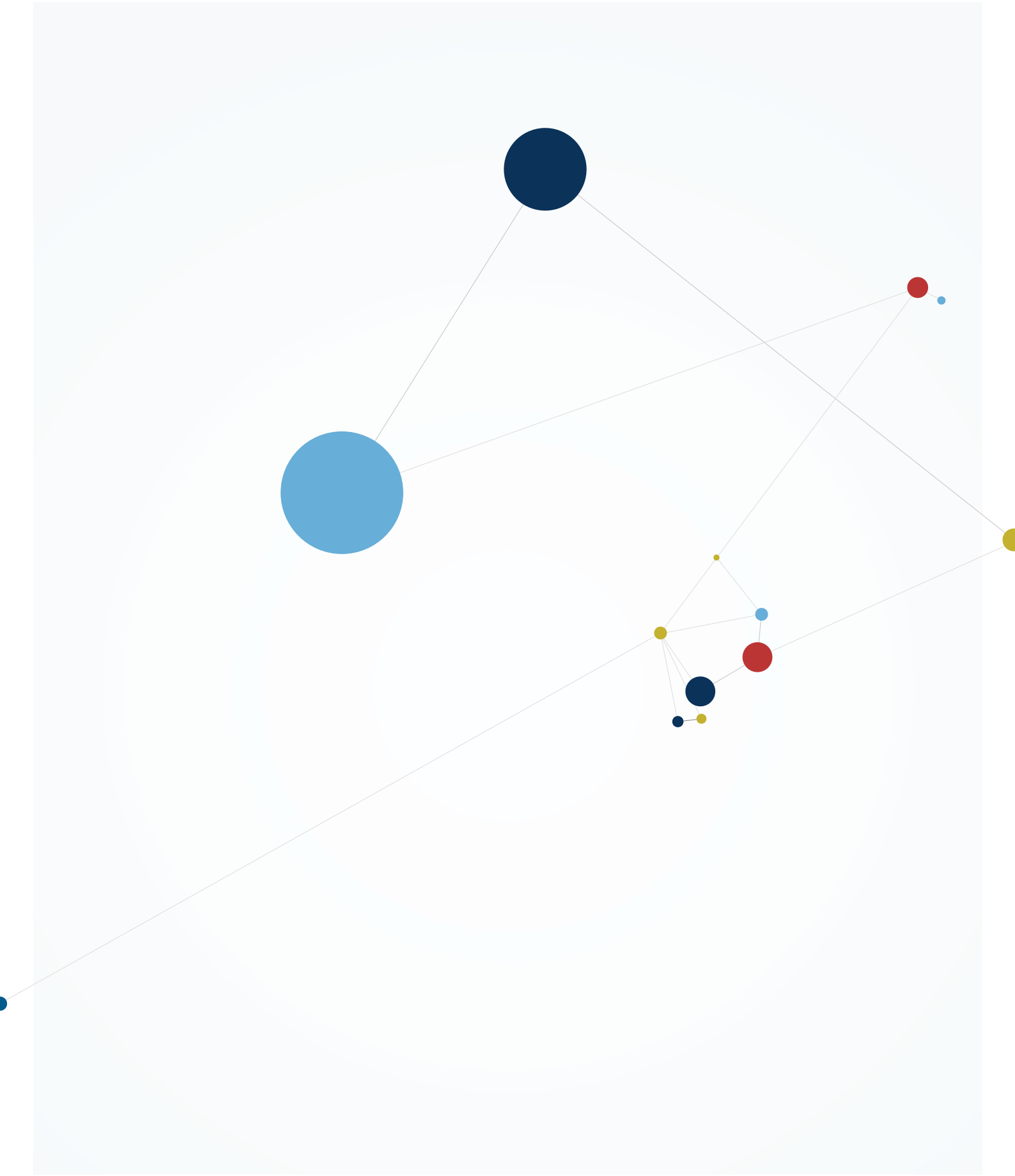
BOSCH
Invented for life



Annual Report **2012**

BOSCH

Invented for life

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.

Key Data
Bosch Group

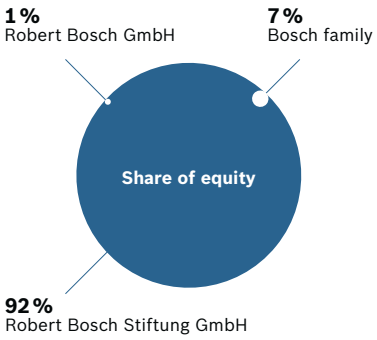
Currency figures in millions of euros	2012	2011
Sales revenue	**52,464**	**51,494**
percentage change from previous year	+1.9	+9.0
percentage of sales revenue generated outside Germany	77	77
Research and development cost	**4,787**	**4,190**
as a percentage of sales revenue	9.1	8.1
Capital expenditure	**3,151**	**3,226**
as a percentage of depreciation	107	142
Associates		
average for the year	306,272	295,256
as of January 1 of the following year	305,877	302,519
Total assets	**56,326**	**54,616**
Equity	**26,884**	**26,917**
as a percentage of total assets	48	49
Profit before tax	**2,796**	**2,628**
as a percentage of sales revenue	5.3	5.1
Profit after tax	**2,342**	**1,820**
Unappropriated earnings (dividend of Robert Bosch GmbH)	**88**	**88**

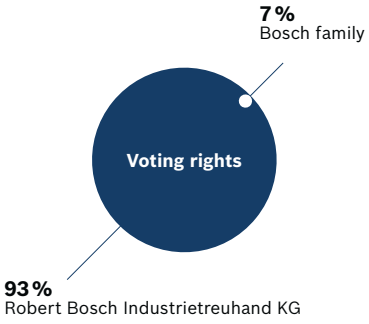
The Bosch Group
at a Glance

The Bosch Group is a leading global supplier of technology and services. In fiscal 2012, its roughly 306,000 associates generated sales of 52.5 billion euros. Since the beginning of 2013, its operations have been 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 roughly 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. Bosch spent some 4.8 billion euros for research and development in 2012, and applied for nearly 4,800 patents worldwide. 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





Bosch Group business sectors

(for the structure up to December 31, 2012, see the group management report, page 21)

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
Solar Energy

[1] ZF Lenksysteme GmbH (50% Bosch-owned)

[2] Bosch Rexroth AG (100% Bosch-owned)

[3] BSH Bosch und Siemens Hausgeräte GmbH (50% Bosch-owned)

Contents
Annual Report 2012

Bosch 2012

Foreword to the 2012 Annual Report

Dear Reader,

As the title of our 2012 annual report suggests, we are headed “into a connected future.” Interconnectivity, already a significant trend, is going to have a decisive impact on our business environment and on how we work together within our company. In the magazine that accompanies our annual report, we elaborate on various manifestations of this trend. For its part, our management report maps out our business development and strategy in greater depth than before. By integrating the previously separate reviews of our business sectors’ activities into the management report, we want to put things into clearer perspective and show how it all fits together.

We are dissatisfied with our business development in 2012. Growth and profit fell far below expectations. The reasons for this include the cooling of the global economic climate, the delayed corrective effect of measures taken to address this situation, and one-off impairments. Our company nonetheless continued to gain momentum, driven by a wealth of innovations, ongoing internationalization, and the further refinement of our work and leadership culture. The magazine also offers greater insight into these issues.

Apart from providing information as to last year’s performance and future trends, this annual report focuses on what we must do to remain a leading supplier of technology and services in the face of growing global competition. First and foremost, this means improving our earnings power in the coming years. We need a strong financial base to preserve our independence over the long term, since only this independence will allow us to bring economic, environmental, and societal concerns into balance. We want to market technology that is “Invented for life”: products and services whose obvious benefits spark enthusiasm among customers.

We must prepare for an accelerated pace of change and a volatile market environment. Globalization, ever scarcer resources, and the internet will radically change the way markets operate. We see this primarily as an opportunity – albeit against a faster paced, more complex, and less predictable backdrop. Particularly when it comes to projects that are important for the company’s future, we must focus on limiting risks

> “Our associates have extensive knowledge, a wealth of experience, and just what it takes to come up with products that spark enthusiasm among our customers.”
>
> Dr. Volkmar Denner

and adjusting our strategy as necessary – in other words, what we are currently doing in electromobility and photovoltaics.

At the same time, we must continue to fine-tune our company’s organization as well as our leadership and work culture to keep in step with the rapid pace of change. Our aim is to achieve a dynamic organization with leaner structures and more efficient processes. This will allow executives and associates to network independently across operating units and hierarchies, to join forces in addressing cross-divisional issues, to share their broad knowledge base, and to drive forward innovations and new business models. We envision an organization in which executives and associates are open to the changes in the world around them, and focus on a culture of solution-driven work and dialogue.

My task, as I see it, is to work together with my colleagues on the board of management to foster such networking and to encourage a greater awareness of what is happening outside our company. On a number of fronts, we have already set these wheels in motion.

In making these changes, we can build on a solid foundation, a successful history, a close bond between our associates and the company, and strong, shared values.

On behalf of the board of management, I would like to thank all our associates for their commitment, as well as all our business partners, shareholders, supervisory board members, and employee representatives for their support. I am personally very grateful for the trust placed in me as the new chairman of the board of management.

With best regards,

Volkmar Denner
Chairman of the board of management

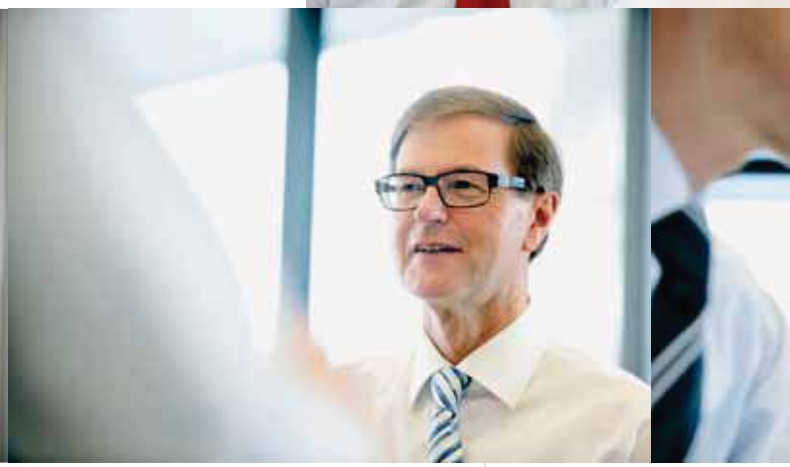
Board of Management

Dr. Dirk Hoheisel

Dr. Werner Struth

Dr. Bernd Bohr

Dr. Stefan Hartung



Dr. Stefan Asenkerschbaumer

Uwe Raschke

Peter Tyroller

Dr. Volkmar Denner

Wolf-Henning Scheider

Christoph Kübel

Board of Management

Dr. Volkmar Denner
Chairman [1]

Corporate Responsibilities
Research and Advance Engineering
Engineering Coordination
Corporate Strategy [1]
Corporate Communications [1]
Senior Executives [1]
Real Estate and Facilities [1]
User Experience [5]

Divisions
Car Multimedia [3]
Automotive Electronics [3]

Subsidiaries
Bosch Software Innovations [2]
Healthcare Telemedicine [2]
ETAS GmbH [3]
Bosch Venture Capital GmbH [1]
Bosch Energy Storage Solutions LLC

Franz Fehrenbach [3]
Chairman

Corporate Responsibilities
Corporate Strategy
Corporate Communications
Senior Executives
Real Estate and Facilities

Subsidiaries
Bosch Venture Capital GmbH

Dr. Siegfried Dais [5]
Deputy Chairman

Corporate Responsibilities
Industrial Technology
Information Technology

Divisions
Drive and Control Technology
Solar Energy

Subsidiaries
Bosch Software Innovations
Healthcare Telemedicine

Uwe Raschke

Corporate Responsibilities
Consumer Goods [2]
User Experience [2]

Divisions
Power Tools [2]
Household Appliances [2,4]

Regional Responsibilities
Asia Pacific, Europe [2],
Middle East [2], Africa [2]

Dr. Rudolf Colm [5]

Corporate Responsibilities
Consumer Goods and Building Technology
Purchasing and Logistics
Insurance

Divisions
Power Tools
Thermotechnology
Security Systems
Household Appliances [4]

Regional Responsibilities
Western Europe; Middle Eastern Europe; Russia; Middle East; Africa

Subsidiaries
Bosch Energy and Building Solutions GmbH

Dr. Bernd Bohr

Corporate Responsibilities
Chairman, Automotive Group
Automotive Systems Integration
Quality

Divisions
Gasoline Systems
Diesel Systems
ZF Steering Systems [4]

Subsidiaries
Bosch Engineering GmbH

Regional Responsibilities
India

Dr. Dirk Hoheisel [1]

Divisions
Car Multimedia
Automotive Electronics

Subsidiaries
ETAS GmbH

Dr. Werner Struth

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

Divisions
Drive and Control Technology [2]
Packaging Technology

Regional Responsibilities
North America
South America

Dr. Stefan Hartung [2]

Corporate Responsibilities
Energy and Building Technology

Divisions
Security Systems
Solar Energy
Thermotechnology

Subsidiaries
Bosch Energy and Building Solutions GmbH

Dr. Stefan Asenkerschbaumer

Corporate Responsibilities
Finance and Financial Statements
Planning and Management Accounting
Internal Accounting and Organization
Purchasing and Logistics[2]
Information Technology[1]
In-house Consultancy

Christoph Kübel

Corporate Responsibilities
Human Resources and Social Welfare
External Affairs, Governmental, and Political Relations
CIP Coordination
Legal Services and Compliance
Taxes
Internal Auditing
Intellectual Property
Insurance[2]

Peter Tyroller

Corporate Responsibilities
Marketing and Sales
Original Equipment Sales

Divisions
Automotive Aftermarket

Wolf-Henning Scheider

Divisions
Chassis Systems Control
Electrical Drives
Starter Motors and Generators

Presidents of the Divisions

Henning von Boxberg[2]
Power Tools

Dr. Rolf Bulander
Gasoline Systems

Uwe Glock
Thermotechnology

Robert Hanser
Automotive Aftermarket

Dr. Stefan Hartung[5]
Power Tools

Holger von Hebel
Solar Energy

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

Gerhard Johannes Steiger
Chassis Systems Control

Dr. Uwe Thomas
Car Multimedia

Dr. Karl Tragl
Drive and Control Technology

Dr. Udo Wolz
Electrical Drives

[1] from July 1, 2012
[2] from January 1, 2013
[3] until June 30, 2012
[4] joint venture
[5] until December 31, 2012

Supervisory Board
Report

Effective July 1, 2012, there was a change in the leadership of the Bosch Group. Following 50 years in the service of the company, Professor Dr. Hermann Scholl stepped down from his various positions. For nine years, he had been chairman of the supervisory board, and for ten years before that chairman of the board of management. In addition, he had been managing partner of Robert Bosch Industrietreuhand KG for 17 years. The Bosch Group owes him a great debt of thanks. We are pleased and grateful that, as honorary chairman, he will remain associated with the company.

This transition, as well as my personal move from chairmanship of the board of management to chairmanship of the supervisory board and of Robert Bosch Industrietreuhand KG, took place at a time of economic difficulty. Moreover, the accelerated pace of change in our business environment calls for a number of changes in the way we manage our company. Nonetheless, we share the board of management's conviction that Bosch Group strategy remains fundamentally sound.

The meetings of the supervisory board were marked by in-depth appraisals of the Bosch Group's development, as well as of the board of management's measures to adjust costs and secure the company's financial strength. The board followed the debate about electromobility very closely, and kept itself well informed about deliberations relating to a reorganization of the photovoltaics business. In addition, it reviewed the consequences of future accounting rules that will no longer allow proportionate consolidation to be applied to fifty-fifty joint ventures, and that will thus have a profound effect on future financial statements. Other subjects considered in detail included the global roll-out of the Bosch Production System and ideas for further training our workforce, which is becoming ever more important in global competition. In addition, the board discussed the annual legal compliance report.

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, 2012. The supervisory board discussed these documents at length and subjected them to its

“The supervisory board and the board of management are united in their determination to secure the company’s lasting and successful development, in the spirit of the company founder.”

Franz Fehrenbach

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.

Effective December 31, 2012, Hans-Peter Gräther resigned from the supervisory board as representative of the group’s senior executives. Dr. Richard Vogt was appointed his successor. Among the employee representatives, the supervisory board’s new term was marked by a change, with Christiane Brenner and Kerstin Mai succeeding Daniel Müller and Wolf Jürgen Röder effective March 22, 2013. The same date also saw a change among the shareholders’ representatives. Professor Dr. Hermut Kormann was succeeded by Professor Dr. Beatrice Weder di Mauro. The supervisory board wishes to thank the outgoing members for their loyal work, and their successors for their willingness to play an active role on the board.

In addition, the supervisory board would like to thank the board of management and all Bosch Group associates. Despite the difficult conditions we faced, they showed dedication and contributed hard work and ideas that will help to make the company ready for the challenges of the future.

Stuttgart, March 2013
For the supervisory board

Franz Fehrenbach
Chairman

Supervisory Board

Franz Fehrenbach
Stuttgart
Chairman (from July 1, 2012)
formerly Chairman of the Board of Management of Robert Bosch GmbH (until June 30, 2012)

Prof. Dr. Hermann Scholl
Stuttgart
Chairman (until June 30, 2012)
Managing Partner of Robert Bosch Industrietreuhand KG (RBIK) (until June 30, 2012)

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

Hans-Peter Gräther
Freiberg am Neckar
(until December 31, 2012)
Vice-President Purchasing, Power Tools Division, and Chairman of the Central Executives' Committee of Robert Bosch GmbH and of the Combined Executives' Committee

Jörg Hofmann
Stuttgart
Regional Chairman of Industriegewerkschaft Metall, Baden-Württemberg Region

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) Zürich

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)
Executive Director, Otto Brenner Stiftung der Industriegewerkschaft Metall, Frankfurt

Tilman Todenhöfer
Madrid
former Deputy Chairman of the Board of Management of Robert Bosch GmbH

Dr. Richard Vogt
Bühl
(from January 1, 2013)
Department Head, Engineering Thermosystems Drives, Electrical Drives Division, 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 (from July 1, 2012)

Prof. Dr. Hermann Scholl
Stuttgart
Chairman of the Shareholders' Meeting (until June 30, 2012)

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 (from January 1, 2013)

Prof. Dr. Hermann Scholl
Stuttgart
Chairman (until December 31, 2012)

Dott. Alessandro Benetton
Treviso, Venice

Dr. Hugo Bütler
Zurich

Prof. Ryozo Hayashi
Tokyo

Baba N. Kalyani
Pune

Dr. Henry A. Kissinger KCMG
Washington

Friedrich Merz
Berlin

Ingo Plöger
São Paulo

Dr. Hans-Friedrich von Ploetz
Berlin

Erwin Schurtenberger
Ascona, Beijing

Louis Schweitzer
Paris

HRH Prince El Hassan bin Talal
Amman
(from January 1, 2013)

Highlights 2012
January to August

January 2, 2012

Since 2007, Bosch has manufactured five million start-stop starters in Hildesheim.

January 24, 2012

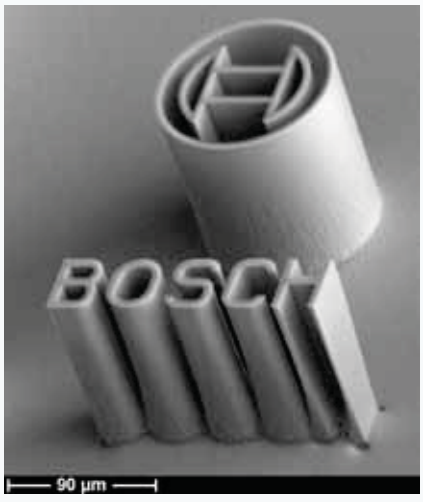
Bosch plans acquisition of SPX Corporation's Service Solutions division in Charlotte, NC, USA.

Growth in diagnosis and service equipment, repair-shop accessories, and software for the global automotive market.

January 5, 2012

Product milestone

Since it began series production 16 years ago, Bosch has produced two billion microelectromechanical systems (MEMS).



March 26, 2012

Milestone for anti-skid system: Bosch has made

75

million ESP® systems since series production began in 1995.

March 28, 2012

Meeting between the board of management and international employee representatives in Abstatt

Third global meeting: 52 delegates from 32 countries.

Constructive dialogue: Franz Fehrenbach (fourth from left) and Christoph Kübel (third from right) meet the international employee representatives, including their chairman Alfred Löckle (third from left)

From the left: Federal Minister of Family Affairs Kristina Schröder, Bosch board of management member Christoph Kübel, Federal Chancellor Angela Merkel, department head Heidi Stock

May 3, 2012

The Bosch Group is named Germany's most family-friendly large company.

As part of the "Success Factor Family" competition, Federal Chancellor Angela Merkel and Federal Minister of Family Affairs Kristina Schröder single out companies whose work to promote a healthy work-life balance is regarded as exemplary.

Royalty visits Schillerhöhe: Prince Albert II of Monaco (middle) is received by the board of management member Siegfried Dais, the chairman of the board of management Volkmar Denner, the chairman of the supervisory board and the shareholders' meeting Franz Fehrenbach, and Baden-Württemberg's minister for the environment, Franz Untersteller (from left)

July 11, 2012

Networked technology for the principality – Bosch collaborates with Monaco

Bosch presents solutions for a networked city that it hopes to develop and implement in areas such as mobility, energy, healthcare, and communications.

Professor Dr. Hermann Scholl

June 30, 2012

Personnel changes at Robert Bosch GmbH and Robert Bosch Industrietreuhand KG

After 50 years of service to the company in various leading positions, Professor Dr. Hermann Scholl steps down effective June 30, 2012. Scholl will be honorary chairman of the Bosch Group. Effective June 30, 2012, Franz Fehrenbach is appointed chairman of the supervisory board of Robert Bosch GmbH. Fehrenbach also becomes managing partner as well as chairman of the shareholders' meeting of Robert Bosch Industrietreuhand KG, of which he has been a partner since 2003. Effective July 1, 2012, Dr. Volkmar Denner is named new chairman of the Bosch board of management.

July 17, 2012

"Associates are a never-ending source of ideas"

Inventors of the year honored: Bosch associates submitted 7,555 notifications of invention last year. In the first six months of 2012, the total surpassed 4,500.

Creative minds: The inventors of the year were honored by Christoph Kübel (far left) and Volkmar Denner (second from right).

Highlights 2012
August to December

August 9, 2012

Bosch and Daimler: hand in hand

EM-motive: Production of electric motors in Hildesheim picks up speed. It is estimated that more than a million will have been manufactured by 2020.

August 23, 2012

Robots for the lawn

New Bosch garden equipment introduced – sector sees 7 percent growth. The most important innovation for the 2013 gardening season is the Indego robot lawnmower.

August 13, 2012

Bosch enters the e-scooter market.

Plans are laid for a joint venture with a Chinese manufacturer to develop, manufacture, and sell e-scooter motors.

September 19, 2012

Think tank for the internet of things and services

The Bosch Group and the University of St. Gallen (HSG) officially launch the innovation lab “Bosch Internet of Things & Services Lab – a Cooperation of HSG and Bosch.”

From the left: Franz Fehrenbach, chairman of the supervisory board, Winfried Kretschmann, minister-president of Baden-Württemberg, Dr. Volkmar Denner, chairman of the board of management and Dr. Klaus Dieterich, president of the corporate sector for research and advance engineering

September 27, 2012

Incubator for innovations: Bosch lays foundation stone for new research and advance engineering center

"We want Renningen to be the source of inspiration for innovations. Such innovations will continue to be essential for the future development of our company," says Dr. Volkmar Denner, chairman of the board of management. "Research and development create the technical conditions for solving the great challenges of our age, in line with our strategic imperative 'Invented for life'."

October 18, 2012

Bosch Rexroth opens manufacturing facility for hydraulics, linear-motion technology, and pneumatics in Wujin, China

Bosch invests 83 million euros, expands its presence in the region, and employs 1,200 associates at the plant.

October 10, 2012

2012 EFQM Excellence Awards for Bamberg and Bari

Bosch plants receive four awards for excellent corporate management.

October 22, 2012

Contract signed: Bosch Software Innovations expands its presence in Asia Pacific

In the future, e-mobility software solutions for the establishment and operation of a battery-charging infrastructure will be used in Taiwan.

December 4, 2012

"Optimum design of processes and structures"

Associates visit the "Straight to G1" online forum 200,000 times, and offer 5,000 responses to the question "what should we improve, and what should we keep?" A project group of 24 associates is selected from more than 700 applicants. Their task is to find ways of simplifying processes at Bosch. Volkmar Denner: "I think it's important to give associates the chance to help improve our company."

Robert Bosch Stiftung

Robert Bosch Stiftung GmbH has been carrying on the charitable and social endeavors of the company's founder in contemporary form since 1964. It pursues its specific objectives with programs and institutions of its own. It also supports external projects and initiatives if their objectives are considered compatible with those of the Stiftung.

The Robert Bosch Stiftung mainly focuses its activities on healthcare, science, education, and international relations. In these areas, the Stiftung's aim is to find possible solutions for socially relevant issues, and to test them in the field as models. The Stiftung finances its work from the dividend it receives as a shareholder in Robert Bosch GmbH. Just like the company, the Stiftung is committed to delivering high-quality results. It develops ideas for improving quality of life and for giving people a better start in life, and ensures that these ideas can be applied as widely as possible.

Learning from each other

On an international level, foundations help bring together and establish dialogue between people from different nations. Mutual understanding is the basis for joint action and bringing about positive change. Typical examples of the Stiftung's work include international scholarship programs, exchange programs for young executives, and research grants for journalists. In light of the challenges faced by the European Union, the Stiftung's initiatives to make Europe stronger were extended on several levels in 2012. Apart from public events and programs for young people and young executives, it was especially the "Ich will Europa" (I want Europe) campaign that attracted a lot of attention. Following the initiative of a group of foundations, prominent personalities such as the ex-German Chancellor Helmut Schmidt and Philipp Lahm, the captain of the German national soccer team, spoke out in favor of a united Europe in print advertisements and television commercials. This campaign has its roots in the strong Franco-German relations that the Stiftung has encouraged ever since its own work began. In 2013, the official Franco-German Year, the 50th anniversaries of the famous Ludwigsburg Address to German Youth by Charles de Gaulle and of the Elysée Treaty have inspired many projects. But the Stiftung is also working to promote international understanding in places such as the U.S., China, Japan, and India. Cultural projects are also an essential part of its international initiatives. For many years, the Stiftung has supported authors and translators, whom it regards as valuable cultural ambassadors. Many young people working in the film industry have benefited from the Stiftung's prize for young filmmakers from Germany and eastern Europe. In 2012, its scope was extended to include the Arab countries.

In the area of healthcare, our focus is on improving vocational and further training, and on improving collaboration between nursing staff and physicians. We have set up programs that address the treatment of dementia patients and the chronically ill. The Robert Bosch Hospital in Stuttgart, which is owned by the Stiftung, regularly acts as a professional partner for practical trials of these concepts. 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 multilingual internet portal, the Stiftung helps to ensure that more and more women are appointed to leading positions in the academic world.

Accelerating the pace of reform

With our "Deutscher Schulpreis" (German school award) and many other programs, we want to improve the quality of the German

Additional information is available online at: www.bosch-stiftung.de/content/language2/html/index.asp

On your marks, get set, research! The cooperation projects nominated for the "Schule trifft Wissenschaft" (Schools meet science) prize were designed to kindle students' enthusiasm for science

school system, as well as to make it more equitable. The German school award casts a spotlight on excellent German schools and inspires other schools to follow their lead. With unconventional initiatives for political education, we primarily appeal to young people who feel alienated by traditional politics. In learning centers in soccer stadiums and as part of the "Du hast die Macht" (You have the power) internet project, young people learn how to get to grips with political issues.

Integration is a further objective of the Stiftung's work. The "Talent im Land" (Talent in the state) and "grips" (savvy) scholarship programs provide support to students from difficult backgrounds as they progress toward higher educational qualifications. In our "Neulandgewinner" (Pioneers of new lands) program we support people in the east of Germany who have developed new ideas for responding positively to structural and economic change in their own neighborhoods. The Stiftung also supports initiatives that address issues specific to old age. With its "Deutscher Alterspreis" (German Senior Citizens' Award), it recognizes ideas for and in old age that promote a new, positive image of this life stage.

Each year, the Robert Bosch Stiftung approves funding for some 800 projects.

Total project grants by Robert Bosch Stiftung Figures in millions of euros	**2012**
Healthcare and science	12.1
Education, society, and culture	16.7
International relations: western Europe, the Americas, Turkey, Japan, India	12.1
International relations: central Europe, southeast Europe, the CIS states, China	11.6
Special area: challenges facing healthcare in the future	0.8
Research at institutes[1] and the Robert Bosch Hospital	8.8
Investments in the Robert Bosch Hospital	5.5
Dependent foundations	1.0
Total	**68.6**

[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 of Robert Bosch Stiftung

Group Management Report

F.01

Bosch Group business sectors

until December 31, 2012

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
Solar Energy

Consumer Goods and Building Technology

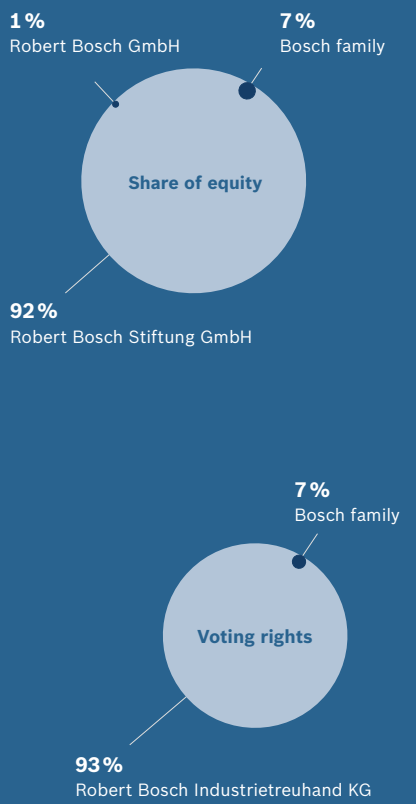
Power Tools
Thermotechnology
Household Appliances [3]
Security Systems

[1] ZF Lenksysteme GmbH (50% Bosch-owned)
[2] Bosch Rexroth AG (100% Bosch-owned)
[3] BSH Bosch und Siemens Hausgeräte GmbH (50% Bosch-owned)

For our company, 2012 was a year of dynamic further development, which was also linked to adjustments to our strategic alignment. The slowdown in the global economy braked sales growth in the Bosch Group over the course of the year, resulting in an unsatisfactory development of result. The key factors in this development, in addition to low sales growth and the delayed impact of cost-cutting measures, were substantial burdens in the photovoltaics segment and upfront investments for a large number of growth projects. Nonetheless, we continued to extend our international footprint through company acquisitions and investments in new plants, and once again spent a high amount on research and development activities. A large number of divisions are also working on products and services which make use of increasing connectivity. We will continue along this path in 2013, even though we do not expect to feel any economic tailwind. Our objectives are to achieve a better increase in sales in the Bosch Group than in 2012 and to improve our result significantly. Our corporate strategy will remain focused on the areas of energy efficiency, resource conservation, environmental protection, safety, and comfort. We want to extend our market position in these areas.

F.02

Shareholders of Robert Bosch GmbH



Economic environment

Europe slips into recession in 2012

As early as our forecast for 2012, we predicted a slowdown in global economic growth. At 2.5 percent, global economic growth in 2012 was down from its previous-year level of 3.1 percent. We had also anticipated considerable economic uncertainties due to the debt crisis in Europe. However, the downturn in Europe was greater than expected. In particular, a number of markets in southern Europe slid into a deep recession, which then spread to economically stronger members of the European Union over the course of the year. Furthermore, economic growth in South America and India was much lower.

The difficult situation in Europe was the main reason why total economic output in developed countries increased by only 1.2%, or around half a percentage point less than our forecast. Gross domestic product (GDP) in the European Union fell slightly, while growth in Germany was slower at 0.7 percent. On the whole, the Japanese economy did not recover as strongly as we had anticipated following the natural disaster in 2011. In contrast, the economic situation was relatively stable in North America, where the economy grew by 2.3 percent. At the start of 2012, we already expected lower economic growth in the emerging countries, due to the end of economic stimulus programs. The increase of about 5 percent largely corresponded to our forecast.

The total number of passenger cars and commercial vehicles produced worldwide rose to around 84 million, equivalent to year-on-year growth of around 6 percent. This figure exceeded our estimates. In our original forecast, serious economic uncertainties meant that we had anticipated an increase of between 3 and 5 percent. However, there was an 11.5 percent fall in production of heavy-duty commercial vehicles, a bigger decrease than expected. We had also not anticipated such a slump in the production figures for passenger cars and commercial vehicles in the European Union. They were some 5 percent lower than in the previous year. Even in Germany, vehicle production in 2012 was slightly lower than in 2011. In addition, the figures for South America were worse than expected, while in North America far more vehicles were produced than forecast.

The capital goods industry experienced a strong downturn in the course of 2012. This development not only affected developed countries, but also large emerging countries such as China. The global lack of investment led to some far-reaching adjustments in production in the mechanical engineering sector. Worldwide demand for consumer goods was not as dynamic as in previous years. Private consumption collapsed in the southern European countries that were seriously affected by the debt crisis. Building activity in this region also remained very weak. However, personal consumption in the emerging countries was robust, also due to the growing middle class there.

Business situation

Only a slight increase in Bosch Group sales in 2012

The global economic slowdown in 2012 is reflected in the Bosch Group's sales. Compared to the previous year, total sales rose by only 1.9 percent to 52.5 billion euros. After adjustment for currency effects, sales were 0.8 percent lower than in 2011. We therefore fell short of our expectations of a nominal sales increase of between 3 and 5 percent. Particularly in the second half of the year, business did not develop as well as we had expected.

Our sales in 2012 were also characterized by substantial consolidation effects as a result of acquisitions and divestments. Newly consolidated companies gave sales a 340-million-euro boost. These were largely acquisitions which we had already signed contracts for in 2011 and which did not make an impact until 2012. The Unipoint Group, Taipei, Taiwan, was included in the Automotive Technology business sector for the first time. Hüttlin GmbH, Schopfheim, Germany, and the business operations of the Manesty division of BWI plc, Knowsley, United Kingdom, were included in the Packaging Technology division for the entire year. The inspection technology specialist Eisai Machinery Co., Ltd., Tokyo, Japan, was consolidated on a pro rata temporis basis. By contrast, the largest acquisition in 2012, the takeover of the Service Solutions division of SPX Corporation, Charlotte, NC (USA), has only a slight effect on sales figures, as the transaction was not completed until shortly before the end of the year. The transaction further strengthens the spare parts and diagnostics business in the Automotive Technology business sector.

The disposal of business operations led to reduced sales of approximately 600 million euros. These effects were largely attributable to the sale of the foundation brakes business of the former Chassis Systems Brakes division and the dissolution of the South Korean joint venture Kefico Corp., Gunpo. Kefico Corp. was a long-standing fifty-fifty joint venture with Hyundai Motor Company for control units and other gasoline-injection components.

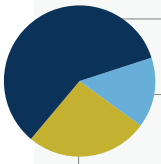
Recession in Europe clearly leaves its mark

Developments varied greatly depending on the region concerned. Business developments in 2012 were especially unsatisfactory in Europe, where we generate more than half our revenues. Sales dropped nominally by 1.9 percent to 29.8 billion euros (2.4 percent after adjustment for exchange-rate effects). With a nominal increase of 5.6 percent to 12.6 billion euros, sales in Asia Pacific failed to match the high growth rates of previous years; after adjustment for exchange-rate effects, sales fell by 0.6 percent. While business in the important Chinese and Indian markets was not as good as we had anticipated, we achieved double-digit growth rates in the southeast Asian countries. Although sales in China increased substantially in a large number of divisions, the collapse in the construction machinery market seriously affected the Drive and Control Technology division. Sales of diesel systems in the Automotive Technology business sector also suffered as a result of the declining commercial vehicle market and the delay in the introduction of new emissions standards in China. Our business operations in Japan benefited from the recovery of the Japanese automobile industry following the slump in the previous year, which was caused by the natural disaster in spring 2011.

F.03

Sales by business sector

Bosch Group 2012
Percentage figures



Automotive Technology
59

Industrial Technology
15

Consumer Goods and Building Technology[1]
26

Total: 52.5 billion euros
[1] Including other activities

We suffered significant losses in South America; sales there dropped nominally by 15 percent, or 9.9 percent after adjustment for exchange-rate effects. This unsatisfactory development was primarily attributable to the less favorable economic climate in Brazil and Argentina, and especially to the slump in automobile production in those two countries. In contrast, business developed very satisfactorily in North America. Our nominal sales rose substantially by 17 percent, or 8.8 percent after adjustment for exchange-rate effects. A much improved situation in the automobile industry and high demand in the Drive and Control Technology division were major contributory factors in this respect. The Consumer Goods and Building Technology business sector also grew encouragingly.

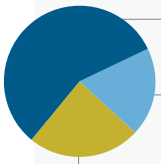
Pronounced differences in the various business fields

Results in the business sectors and divisions differed in 2012, even though they were all seriously affected by the recession in important European markets. We strengthened our position in a number of areas through acquisitions, and continued to expand our global presence. We were especially successful with products that contribute toward improved energy efficiency, safety, and comfort. We also made a number of adjustments to our business strategy. This included dissolving some joint ventures.

F.04

Sales by region

Bosch Group 2012
Percentage figures



Europe
57

Americas
19

Asia Pacific[1]
24

Total: 52.5 billion euros
[1] Including other countries

Slump in heavy trucks burdens Automotive Technology

The Automotive Technology business sector discloses sales of 31.1 billion euros in 2012, a year-on-year increase of 2.1 percent. However, there were some substantial consolidation effects, such as the first-time inclusion of the Unipoint Group. However, the negative sales effects due to the sale of the foundation brakes business and the dissolution of the Kefico joint venture were far more serious. Without these changes, nominal growth in the Automotive Technology business sector would have been 3.6 percent.

The majority of divisions in the Automotive Technology business sector recorded a positive business performance, some with substantial increases. However, some divisions were hit hard by the slump in the worldwide production of heavy trucks. This segment accounts for around half our entire commercial vehicles business.

This slump was another reason for the significant downturn in sales in the Diesel Systems division. One other factor was the difficult market situation in southern Europe, where the proportion of diesel passenger cars in relation to new vehicle registrations is traditionally very high, and where Bosch has a high market share. In India, by contrast, diesel passenger cars developed very favorably. The division also achieved success with its Denoxtronic exhaust-treatment system, for which there is rising demand due to the tightening of emissions standards, especially in Europe. Diesel exhaust treatment is also becoming more important in commercial vehicles, and especially in construction and agricultural machinery. This is highlighted by the acquisition of all the shares in the Bosch Emission Systems GmbH & Co. KG subsidiary, based in Stuttgart. In addition, we launched even more economical common-rail systems.

The year 2012 saw high demand for energy-efficient and eco-friendly powertrain technology for gasoline engines. However, the drop in the production of vehicles in Europe was noticeable here. There is a marked trend toward gasoline direct injection systems, an area in which we were able to increase our sales by around 50 percent. The demand for small, economical, yet powerful engines is increasing continuously. This is also leading to an expansion of the turbocharger market – with benefits for our Bosch Mahle Turbo Systems GmbH & Co. KG joint venture, based in Stuttgart. Fuel consumption is also being reduced by start-stop systems. These are highly successful in Europe, and are also increasingly being installed in vehicles with automatic transmission. We are also extending our presence in the market with new high-performance generators. However, the Starter Motors and Generators division's weak commercial vehicles business also proved difficult.

In view of growing interest in hybrid solutions comprising an internal-combustion engine and an electric powertrain, the product portfolio of EM-motive GmbH, Hildesheim, Germany, a joint venture established in 2011 with Daimler AG, was extended from traction machines for electric vehicles to include hybrid vehicles. We are involved in some initial projects for "plug-in hybrids," which permit purely electric driving over longer distances and battery charging via a power socket. We also launched the world's first axle-split hybrid powertrain for diesel passenger cars.

The all-electric vehicle will remain a niche product over the next few years. Given these conditions, it will be difficult to achieve economical volumes with power electronics, traction machines, and batteries. The dissolution of the SB LiMotive Co. Ltd. joint venture, Giheung, Korea, in fall 2012 provides us with an opportunity to pursue a new strategy. The entire battery systems business was transferred to Bosch, while the former partner Samsung SDI remains a supplier of battery cells. The dissolution of the joint venture led to the establishment of Robert Bosch Battery Systems GmbH, Stuttgart, which is focused initially on the further development and production of lithium-ion battery systems. Robert Bosch Battery Solutions GmbH, Eisenach, Germany, runs a pilot production line for battery cells for maritime applications in Europe. We are represented in the U.S. by engineering activities in Orion, MI, and a manufacturing plant in Springboro, OH. An engineering team is also already working at the Suzhou location in China.

We enjoyed great success in the business field of electric drive systems and control units for bicycles with an additional electric drive (e-bikes). We considerably extended our position in this rapidly growing market. We believe that two-wheelers will become more important, especially in conurbations, due to growing traffic density. We took account of this situation by acquiring a majority stake in a joint venture with the Chinese supplier Ningbo Polaris Technology Co. Ltd., Ningbo. We signed the agreements for this joint venture in 2012. This company manufactures motors for electric scooters and is being integrated into the Electrical Drives division.

Safety is playing an increasingly important role in the two-wheeler market. In 2012, we introduced an motorcycle ABS system with traction control. We have also developed a stability control system called MSC motorcycle stability control. Series production of this system will start in 2013. Equipped with a new sensor, the system supports riders for the first time in every driving situation, including braking and accelerating at steep lean angles. After ABS, the ESP® stability program is increasingly becoming established as a safety system in automobiles. Since the start of series production in 1995, we have sold nearly 90 million units throughout the world.

In automotive safety systems, there is an increasing trend toward a combination with assistance systems for predictive accident prevention. Over the longer term, the aim is to bring about automated driving, in which closer networking with the vehicle's surroundings will ensure even greater safety. We have acquired the first orders for an extremely compact stereo video camera which improves pedestrian protection, among other things. Driver assistance systems are also becoming more important in the area of convenience functions. In the area of parking assistance systems, we launched a pull-out assistance system. This assistance system goes beyond the familiar parking assistance systems, helping the driver to easily maneuver out of the parking space and merge quickly and safely into traffic.

We are also focusing on the connectivity of assistance systems and information systems. This will provide users with even more features and convenience. In summer 2012, the Car Multimedia division initially launched an infotainment system in North America. This system is based on Linux, and thus partially on open source software. Its characteristics include touch screen operation derived from smartphones, as well as natural voice control. It won the Innovation Prize in the car-tech category at the CES electronics exhibition in Las Vegas at the beginning of 2013. By acquiring the majority stake in Bosch Car Multimedia Wuhu Co. Ltd., Wuhu, China, the Car Multimedia division also plans to extend its position in the Asian market.

The Automotive Electronics division is continuously increasing its range of semiconductors for both automotive and non-automotive applications. Bosch Sensortec GmbH, Küsterdingen, Germany, has made us one of the world's leading suppliers of microelectronic-mechanical systems (MEMS) for consumer electronics. The subsidiary Bosch Power Tec GmbH, Hamburg, Germany, bolstered its expertise in the area of photovoltaic inverters through the acquisition of the Hamburg-based voltwerk electronics GmbH. The Automotive Electronics division's strategy also involves stepping up its activities as a contract manufacturer.

In 2012, the subsidiary Bosch Engineering GmbH, Abstatt, Germany, again successfully supplied engineering services, as a systems development partner, for niche applications based on Bosch automotive products. These include the use of radar sensors for rail vehicles and electrification of the powertrain of off-highway applications. Furthermore, Bosch Engineering develops small-

series solutions for sports car manufacturers. The subsidiary ETAS GmbH, Stuttgart, expanded its new business field of “embedded security” by acquiring ESCRYPT GmbH, a systems unit based in Bochum, Germany, which specializes in security solutions in embedded systems. The company also opened new locations in Japan and Thailand, and broadened its advisory services.

We achieved sizable sales increases with power-assisted steering systems made by our ZF Lenksysteme GmbH joint venture, Schwäbisch Gmünd, Germany. In particular, electric power-assisted steering for cars, which increases both comfort and energy efficiency, is developing encouragingly. In contrast, the commercial vehicles business noticed the effects of the difficult market environment. There was only a slight rise in demand in the Automotive Aftermarket division. This was especially true of the spare parts business with automakers, and above all with important European customers. We are extending our business with independent repair workshops by increasing in-house production of spare parts and expanding our international presence. The significant milestones here are the acquisition of the Unipoint Group and the Service Solutions division of SPX Corporation. These are currently being integrated into the Bosch Group. On the other hand, we announced the sale of our shareholding in Purolator Filters NA LLC, Fayetteville, NC (USA), our joint venture for filters for the OEM and spare parts business, to the current joint-venture partner, the Mann + Hummel Group, Ludwigsburg, Germany.

Stagnating sales in Industrial Technology

After experiencing positive growth in the first six months of 2012, the Industrial Technology business sector felt the effect of the slump in the capital goods industry during the rest of the year. Sales stagnated at 8 billion euros.

The significant economic slowdown primarily affected the Drive and Control Technology division, which supplies control solutions and drives for industrial and mobile applications. Following the substantial increase of previous years, sales growth slowed substantially in 2012. One of the main causes was the slump in the market for construction machinery in China. Sales in Europe stagnated due to the difficult economic climate. However, sales increased considerably in North America. Business for our components and systems for wind turbines remained unsatisfactory. China is now also the world’s largest market in this field. However, it is difficult to gain access to the dominant local manufacturers of wind turbines. Over the medium-to-long term, however, the global market for wind power has great potential.

There is growing worldwide demand for more energy-efficient drive and control solutions. In the area of mobile applications, the Drive and Control Technology division started marketing its Hydraulic Traction Assistant (HTA), an auxiliary hydraulic drive which gives commercial vehicles all-wheel drive characteristics. Fuel consumption is reduced significantly thanks to low system weight and low friction. In mechanical engineering and process plant engineering, energy-efficient components and systems such as the Sytronix variable-speed pump drive are playing an increasingly important role in reduc-

ing energy consumption. The division was also involved in numerous large-scale projects. For example, it provided hydraulic systems solutions for the La Yesca hydropower station in Mexico, which was completed in 2012. We are still planning to dispose of our pneumatic activities, since their growth areas lie outside the markets that are of strategic relevance to our company.

Our Packaging Technology division developed well in 2012. The main customers of this division are pharmaceuticals and food companies which are less susceptible to changes in the economic climate. The developing and emerging countries are the main drivers of growth in these markets. The division is therefore continuing to expand its international footprint. In 2012, the division's activities included the opening of its new manufacturing site in Verna, India. It also opened a sales company in Egypt to exploit better the market in North Africa. One further major task was to integrate the Hüttlin, Manesty, and Eisai acquisitions. The division also purchased Ampack Ammann GmbH & Co. KG, Königsbrunn, Germany, which operates in the area of bottling and packaging machinery for paste-like and liquid foodstuffs.

In contrast, developments in the Solar Energy division were extremely difficult. The price of solar modules again plummeted by around 40 percent, which led to decreasing sales revenue and heavy losses throughout the industry, despite higher unit sales. An extensive package of measures was therefore rolled out. Apart from intensive efforts to cut costs, they included the end of thin-film activities in Erfurt, Germany, and of module production in Spain and China. We also suspended the plans for a new manufacturing plant in Penang, Malaysia, that were announced in 2011. However, the cost improvements made could not keep pace with the fall in prices. Intensive deliberations and discussions concerning the future strategy of the Solar Energy division are currently taking place.

Regional differences in consumer goods and building technology

The Consumer Goods and Building Technology business sector increased its sales by 2.5 percent to 13.4 billion euros. In most divisions, the losses caused by the recession in southern Europe contrasted with favorable developments in North America, Asia Pacific, and some eastern European countries.

In the Power Tools division, there were very distinct regional differences in the markets for power tools. The markets in southern Europe and South America failed to match our expectations. In contrast, sales rose considerably in eastern Europe, Asia, and North America. On the whole, the division increased its worldwide market share despite a weakening economic environment. A large number of new products were again launched in 2012. In the professional segment, these include very low-vibration hammer drills. In the Scandinavian market, the go-ahead was given for the launch of the Indego robot mower. We continue to extend our range of cordless devices. One practical innovation for the DIY market is a cordless screwdriver with integrated accessories. The new production plant for abrasives in Frauenfeld, Switzerland, also came on stream. A sum of 45 million euros has been invested in this location over the past few years.

In southern Europe, developments in the Thermotechnology division were unsatisfactory. However, the division achieved very encouraging growth rates in Russia, and also extended its market presence in that country. In the next few years, a new location for the production of industrial boilers and wall-mounted heaters is to be constructed in Engels. In addition to systems solutions for combining fossil fuels and renewable energy sources, energy-efficient systems for industrial customers are becoming more important for the division. It also gained a stronger foothold in South America and Asia Pacific. The focal points in South America are further development of project business involving solar thermal systems and products for hot-water generation. In 2012, we acquired Heliotek Máquinas e Equipamentos Ltda, São Paulo, Brazil, a manufacturer of solar thermal systems and heat pumps. A new manufacturing site for solar thermal systems also came on stream in Bangalore, India.

Our Security Systems division supplies video systems, intruder alarms, evacuation systems, and fire alarms, and provides a wide range of services through its communication centers. This division also continued to expand its international presence. It achieved strong sales growth not only in Asia – primarily China – but also in Turkey, Russia, India, and South America. By contrast, demand was low in a number of important European markets. In 2012, we acquired the operational activities of communication centers belonging to IZO Brasil Consultoria Ltda, São Paulo, Brazil. In addition, the division opened a new communication center in Chengdu, China. Bosch operations centers now supply the first international service based on the eCall automotive emergency call system. When an emergency call is triggered automatically, these centers make contact with the vehicle and ensure that assistance is provided fast.

Growth in our BSH Bosch und Siemens Hausgeräte GmbH joint venture was restrained. The total worldwide market for large domestic appliances stagnated in 2012. In addition to extremely weak demand, particularly in southern Europe, it felt the effects of the unexpected slump in the important Chinese market following the end of economic stimulus programs. Competitive intensity remained high in the European market, driven above all by suppliers from Asia and Turkey. However, BSH maintained its market leadership in Europe. In announcing the acquisition of Zelmer S.A, Rzeszow, Poland, BSH intends to generate additional growth with small domestic appliances – primarily in eastern Europe. In southeast Asia, the company enjoyed encouraging growth, and will extend its activities in that region. The change in the commercial environment caused by the internet led to further price pressure. BSH is countering this by means of innovations and cost adjustments. In 2012, for example, BSH launched myBosch, its first digital product support package. All information and services relating to a particular household appliance are available interactively via the homepage and an app.

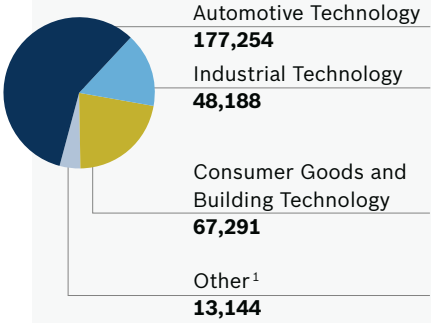
Slight rise in number of associates worldwide

On the back of the slackening sales trend, we took measures to adjust the recruitment of additional associates over the course of the year. Our total worldwide workforce rose by 3,400 to some 305,900. Around 1,500 additional associates were hired in the existing divisions. The remaining increase

F.05

Headcount by business sector

Bosch Group 2012
As per: January 1, 2013

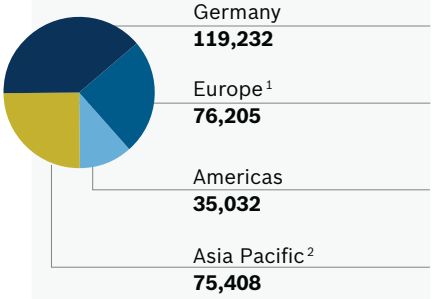


Total: 305,877
[1] Corporate functions and research

F.06

Headcount by region

Bosch Group 2012
As per: January 1, 2013



Total: 305,877
[1] Without Germany
[2] Including other countries

of roughly 1,900 associates was due to consolidation effects. Around 7,900 associates were added as a result of companies included in consolidation for the first time, predominantly through the purchase of Unipoint, the acquisition of the Service Solutions business of SPX, and acquisitions in the packaging technology business field. This is in contrast to a headcount reduction of around 6,000 due to the sale of the foundation brakes business and the disposal of the Kefico joint venture.

The biggest change in associate numbers took place in Asia Pacific, where they grew by 4,200 to 75,400. Of these additional recruits, some 3,300 joined existing areas of business. The total workforce in Europe at the end of the year was 195,400, a slight decline on a year ago. We employed 119,200 people in Germany, roughly equivalent to the figure in 2011. There were also decreases in southern Europe as a result of the disposal of the foundation brakes business, while the number of associates increased in some countries in eastern Europe. The total number of associates in the Americas (roughly 35,000) remained practically unchanged. However, there were also contrary effects in that region, especially due to the integration of SPX associates and redundancies in Brazil.

Training and education play an indispensable role in our company. Around 6,500 young people were in apprenticeship schemes at Bosch worldwide in 2012. Germany, which has a long tradition of dual education in companies and schools, leads the field here with 4,600 apprentices. Every year we spend around 200 million euros on associate training. Worldwide, associates attended 531,000 courses in 2012, a further slight increase compared to 2011. In these courses, more attention is being paid to international know-how transfer. For example, Robert Bosch Kolleg, which offers training at university level for specialists and executives, staged an international innovation seminar for the first time in 2012 in cooperation with renowned institutes in Germany, India, and China. The “Bosch Human Resources System 3.0” project also underlines the importance of intensive human resources activities. The focal point of this several-year project is the introduction of a new worldwide human resources organization and an integrated information system.

Strategy

Basic alignment still valid

The core elements of our strategy – focused diversification, a high level of innovative strength, and the expansion of our global presence – remain unchanged. The development of our strategy is systematically geared toward major megatrends, and primarily toward the increasing demands being made with respect to resource conservation and environmental protection, globalization, and an aging population in many countries. On top of this, there is greater networking of people and products through the internet, which is resulting in new services and business models.

Our objectives are to be one of the world’s leading suppliers of technology and services, to generate higher profits, and to preserve our entrepreneurial freedom and financial independence. True to the principle of sustainable corporate development, we also take on social and environmental responsibility.

The key to our business independence is our corporate constitution with a charitable foundation and the family of the company founder, Robert Bosch, as shareholders, and with an industrial trust that carries out the entrepreneurial ownership functions.

In order to strengthen our global market position, we want to increase sales by an average of 8 percent over the long term, including acquisitions. Our strategic imperative here is “Invented for life” – beneficial technology whose user-oriented functionality or design sparks enthusiasm in customers. Resource conservation, environmental protection, energy efficiency, safety, and comfort will remain crucial considerations in the future as well. Additional business opportunities will arise through the expansion of web-based business models and cross-divisional cooperation. Our services business will also become increasingly important. We now already generate sales of 3.2 billion euros, or around 6 percent of our total sales, through engineering and general services.

Need to adjust to a dynamic environment

We will adhere to these objectives and our fundamental strategy, even though megatrends will increasingly be accompanied by events that are unforeseeable or difficult to assess. Examples include changes in legal regulations relating to things such as energy policy, or economic crises. The result is a complex and dynamic environment which offers great opportunities, but also harbors major uncertainties and greater risks. At present, this mainly affects growth projects. We are already working on these, while we continue to extend existing business areas. One key task is to push ahead with these projects while limiting the resulting risks and upfront investments in order to ensure that our company remains profitable.

For example, we are active in the field of renewable energy, especially photovoltaics, solar thermal systems, and wind power. In North America, moreover, telemedical care is a pioneering field which we are driving forward. We are also undertaking significant upfront investments in electromobility and new web-based products, services, and business models. We face the additional challenge that our core markets in Europe will continue to feel the effects of the debt crisis for some time, and that this limits growth potential. For this reason, we must improve the competitiveness of our locations and introduce structural adjustment measures where required.

If the economic climate changes, we make necessary adjustments. Examples of such adjustments include the realignment of our electromobility business and our deliberations regarding renewable energy. We already employ around 1,100 associates in the field of electromobility, and currently invest approximately 400 million euros each year. For suppliers, this business field has excellent potential for increasing value-added share. And our company covers the complete value-added chain for electrical powertrains – from the battery, power electronics, and different types of electric machines through to extensive systems integration expertise. We will continue to work without

let-up in these areas. However, electromobility will not take off as a volume market until after 2020. Our upfront investments must therefore be coupled to market developments, especially since substantial overcapacity already exists with battery cells, and high price pressure can be expected. In addition, there are indications that the exploitation of shale gas and shale oil reserves in the United States, and probably other countries as well, will delay the transition to the age of renewable energy. We have to consider that this may also result in greater numbers of spark-ignition engines driven by natural gas (CNG). However, this will depend on whether economies of scale can reduce the additional costs currently associated with CNG, and on whether the necessary infrastructure can be sufficiently expanded. We already market engine management systems and injection components for spark-ignition engines driven by natural gas.

The exploitation of shale gas and shale oil is also likely to affect the use of renewable energy to generate electricity. Depending on the region, such use may be delayed. Nonetheless, in the long run it can be expected that future energy systems will increasingly be based on renewables due to climate-protection considerations and scarcer, and thus more expensive, fossil fuels. This was also one of the main reasons for entering the photovoltaics market in 2008. At that time, however, there was no way of predicting the substantial overcapacity that would occur in this industry within a very short space of time. The related slump in prices has led to enormous losses throughout the industry. For Bosch Solar Energy, there is the additional burden of location-related cost disadvantages compared with leading Asian competitors. This extremely difficult situation also calls for a realignment. We are currently working on this.

Innovative strength boosted

In spite of these adjustments, our future strategy will continue to center on resource conservation, energy efficiency, and environmental protection – considerations which have long been at the focus of Bosch activities. Products in these areas account for roughly half our research and development budget, and around 40 percent of sales. They extend from economical internal-combustion engines, new electromobility developments, highly efficient hydraulic powertrains, recycling of automotive components, energy-efficient household appliances, and energy-efficient heating and hot-water systems through to the use of industrial waste heat and power generation from renewable sources.

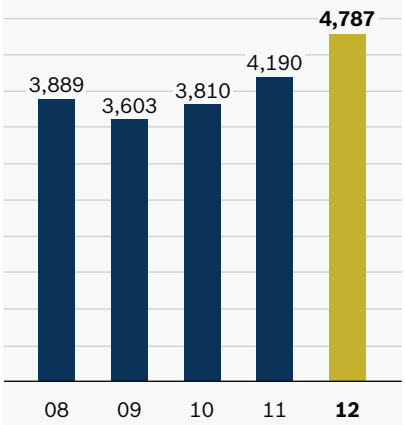
We further boosted our innovative strength in 2012. Our total research and development expenditure reached a record level of 4.8 billion euros in 2012. We hired an additional 4,300 research and development associates, around 2,200 of them in Asia Pacific. In all, we now employ 42,800 researchers and developers worldwide, 26,400 of them Europe (mainly Germany), 2,600 in the Americas, and 13,800 in Asia Pacific. We applied for nearly 4,800 patents in 2012, 650 more than in the previous year. We will further extend our research activities by investing a sum of more than 300 million euros in the establishment of a new research center in Renningen, near Stuttgart. Work on construction of this research center started in 2012.

Our main areas of research in the field of mobility include the further optimization of the conventional powertrain in order to comply with future emissions standards. This involves work on the systems and components level, such as downsizing, waste heat recovery, and inexpensive but highly precise sensors. In the field of electromobility, researchers are working on the entire powertrain, from energy storage through to the drive motor. We also focus on the driver assistance functions that are becoming increasingly significant as we progress toward automated driving. The main areas of this work are image capture and processing – for value-added functions which complement traditional sensors – and the human-machine interface. This interface has to be designed in a way that will allow drivers to use assistance systems without them diverting their attention from what is happening on the road. We are also paying close attention to the field of robotics. Bosch is cooperating with renowned international institutes in order to make robots even safer, more cost-effective, and more suitable for many different everyday applications.

F.07

Total research and development cost [1]

Bosch Group, 2008 - 2012
Figures in millions of euros



[1] Including development work charged directly to customers

Global presence becoming more important

In addition to focused diversification and increased innovative strength, the third core element of our strategy is the expansion of our global presence. Our longer-term objective is to attain a sales share of 30 percent in the growing Asia Pacific market. We also want a sales share of at least 20 percent in the Americas, to participate in growth there. In 2012, Asia Pacific already accounted for 24 percent of sales, while the corresponding figure for the Americas was some 19 percent, both equivalent to a year-on-year increase of roughly 1 percentage point. Due to low rates of growth, Europe's share of sales will decrease to around 50 percent. However, the European market will remain an important core market, and one in which we aim to strengthen our position.

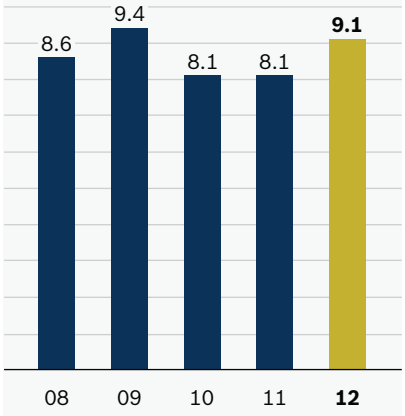
The divisions completed some important groundwork for further internationalization of their activities in 2012. They made some acquisitions and also invested in a large number of new locations. One focal point was capacity expansion in eastern Europe and Asia where, besides China and India, countries in southeast Asia in particular are becoming more important. For example, one of our three research centers in Asia is located in Singapore. In Vietnam, we are considerably stepping up our software development activities. We are also investing around 230 million euros in the production of push belts for continuously variable transmissions. A new factory for packaging machinery started operating in Thailand in 2012. We also set up a sales company in Bangladesh and liaison offices in Laos and Myanmar.

A stronger orientation to local markets is vital for our future success. In addition to manufacturing activities, this involves local development work to create product designs tailored especially to customers in emerging countries. With the help of such products, we want to participate in the strong growth in the mid-range segments in those countries. The know-how acquired in the process is increasingly also being transferred to established markets. One example is the starter for heavy trucks that we developed in China. This highly robust and inexpensive starter will also supplement our product portfolio in Europe. At the same time, we must meet the worldwide challenge of new competitors, especially from Asia.

F.08

Total research and development cost [1]

Bosch Group, 2008 - 2012
% of sales

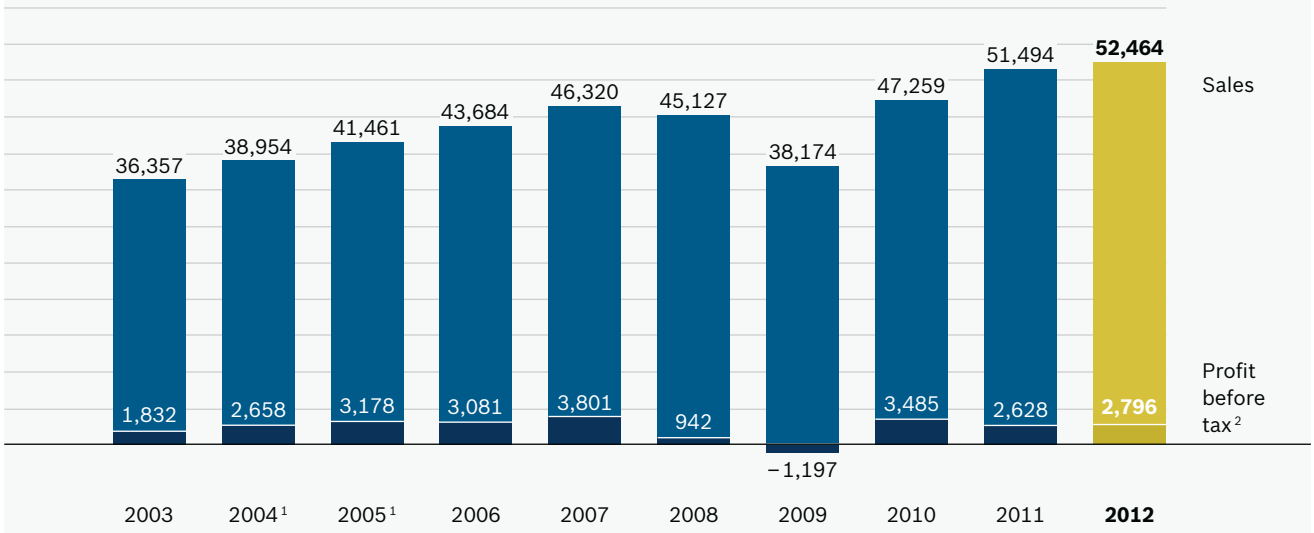


[1] Including development work charged directly to customers

F.09

Sales and profit before tax[2]

Bosch Group, 2003 - 2012
Figures in millions of euros



[1] Pursuant to IFRS, continuing operations only; sales pursuant to HGB 2004: 40 billion euros
[2] Up to 2003, designated income from ordinary business activities pursuant to HGB

Rearrangement of business sectors

In our organizational structure as well, we gear our operations to the underlying trends which are changing the global competitive environment. One important step here is the establishment of a fourth business sector – Energy and Building Technology – at the start of 2013. This step takes account of the way the markets for building technology and energy are merging. The business sector will comprise the Thermotechnology division as a supplier of heating technology and water heating solutions, the Security Systems division as a supplier of security products, infrastructure solutions, and communication services, the Solar Energy division, and the newly established Bosch Energy and Building Solutions GmbH, Ditzingen, Germany. Including newly acquired companies, this latter provider of energy services now employs around 100 associates. It was awarded a number of contracts in 2012. Especially for the operators of commercial and industrial facilities, eco-friendly, energy-efficient, and thus cost-effective complete solutions are becoming increasingly important.

However, we believe that closer cooperation among divisions across business-sector boundaries also offers additional potential. For industries such as mining for example, we have created a sales organization which supplies customized solutions relating to products and services from divisions such as Automotive Aftermarket, Drive and Control Technology, Power Tools, Thermotechnology, and Security Systems. Divisions from different business

sectors are also cooperating ever more closely to develop products. The Thermotechnology division has developed a new oil-fired condensing boiler. For the first time, this features an injection valve and a lambda sensor – components which are usually utilized in automotive technology. Our innovative hydraulic hybrid powertrain for gasoline-powered passenger cars is the result of cooperation between the Diesel Systems division, with its expertise in high injection pressures, and the Drive and Control Technology division, with its specialist knowledge in hydraulics. This inexpensive and robust technology reduces CO_2 emissions by up to 45 percent in urban traffic.

Internet as a driver of new products and services

One of the major drivers of new products, services, and business models is internet connectivity. This includes internet platforms such as Drivelog, offered by the Automotive Aftermarket division. Launched initially in Germany in 2012, it combines mobility services for car drivers and repair shops. After Singapore and Milan, we are now also creating web-based platforms which connect business models for electromobility in Stuttgart and Berlin. Data exchange is done automatically in certain instances, for example when billing for “filling up with electricity” at charge spots. This automatic exchange of data between devices and systems is the main characteristic of the internet of things and services, which will shape markets to an increasing extent in the future. Other areas of application include automatic condition monitoring systems in mechanical engineering and process plant engineering. Our Security Systems division provides small and medium-sized companies with new web-based surveillance and service solutions. One important supplier of internet applications is our subsidiary Bosch Software Innovations GmbH, based in Immenstaad, Germany. Including inubit AG, Berlin, it now employs some 500 internet specialists.

Challenges for leadership

The combination of an accelerated pace of change in the market environment and increased global competition calls for flexible company processes and structures and an even sharper focus on what is happening outside the company. Cultural diversity and cooperation across hierarchies are also becoming increasingly important in this respect.

The closer internal networking brought about by the Enterprise 2.0 project is intended to lead to greater agility. More and more cross-divisional project teams are to be encouraged to handle tasks with a high degree of autonomy and creative freedom. In 26 pilot projects, some 10,000 associates worldwide are now gaining experience with the Bosch Connect communication platform. An important role is played here by the extension of knowledge management and the transfer of know-how. In the “Bosch internal open source” project, or BIOS for short, associates from different divisions and countries work on software solutions in autonomous groups. Moreover, it is hoped that the new corporate department for user experience will help the company tune its antennae better to the outside world. Comprising engineers, computer scientists, psychologists, and specialists in design and prototypes, this department will support the divisions in designing products which are more user-oriented and thus more attractive.

At the same time, we aim worldwide for diversity among associates and executives, since we believe that mixed teams are source of additional ideas. One of our aims is to increase the proportion of international executives. In the future, we want at least 80 percent of executives at our locations outside Germany to be natives of the respective country. We made further progress here in 2012. We have already achieved this aim in many focus countries such as the United States, Brazil, Japan, and India. And we are also close to achieving it in China, Mexico, Hungary, and the Czech Republic.

One other objective with respect to diversity is to increase the proportion of women in executive positions from 11.5 percent in 2012 to 20 percent by 2020. A global communication initiative will play a part here, along with additional measures to ensure a better balance between family and career and a further development of the management and work culture. In 2012, we carried out a worldwide trial in which 150 executives worked flexibly on a part-time basis or at home. Since 2012, moreover, the social skills acquired through family leave are also a possible career component for executives.

We are also improving dialog across hierarchical levels. Using an internal communication platform, associates all over the world were requested to make suggestions for improving processes. Based on these requests, we have initiated projects in which interested associates develop solutions with the support of the departments responsible.

Advantages through networking in purchasing and logistics

Our corporate purchasing sector is also supporting efforts to use networked know-how to bring innovations to market even more quickly. The objective is to include supplier expertise and creativity in very early concept stages for new products and systems. To this end, purchasing is continuing to expand its worldwide knowledge base and is cooperating even more closely with internal research and development departments. In logistics, we believe considerable advantages can be gained by increasing cross-divisional pooling of the planning and implementation of land- and sea-freight operations. The aims are cost advantages through a reduction in transport volume and lower CO_2 emissions. Another strategic purchasing task is to support the expansion of the international manufacturing network by establishing local supplier networks.

We continue to pursue our strategy of pooling purchasing volumes. After a complex reorganization process, the cross-divisional purchasing organization for externally procured automotive parts is beginning to pay off. This also applies to group-wide purchasing processes for indirect materials, which include services, machinery, systems, equipment, and tools. Purchasing volume decreased due to sales leveling off. We spent some 27.1 billion euros on production materials, merchandise, supplies, services, and machinery in 2012, compared to 29.1 billion euros in the previous year.

Quality through transparent customer requirements

High quality standards are another integral part of our corporate strategy. They start with a deep understanding of products and processes, since such know-how leads to first-class solutions for our customers. Their requirements become clear as a result of systematic market analysis and of more simultaneous development with our customers. The pooling of responsibility for automotive technology quality in purchasing is also showing some early signs of success. Our suppliers appreciate simplified communication via one or a limited number of contacts. For the company itself, the advantage is that we obtain a broad, cross-divisional picture of the quality of our suppliers.

One important challenge is shorter development cycles for new technologies. In order to limit risks, we rely on traditional, preventive quality methods, and increasingly also on active field observation in the respective applications, markets, and regions. In this way, we are strengthening our understanding of the specific requirements of customers and markets. This knowledge is then incorporated into product design and validation. Relevant quality indicators such as complaints also declined in 2012, and confirm that we are on the right track with this approach. Numerous customers have also recognized our continuous and systematic improvement processes with quality awards.

High environmental and occupational health and safety standards

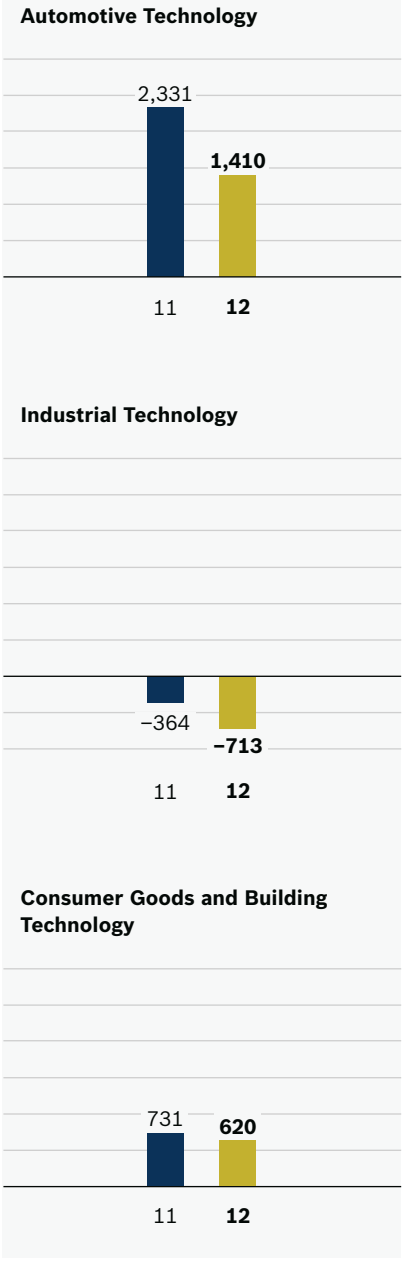
Our mission is also to help protect the environment and conserve resources through our production processes. In order to reduce emissions, we are working intensively to improve energy efficiency at our locations. By 2020, our objective is to cut relative, production-related CO_2 emissions from our locations by 20 percent from their 2007 level. In 2012, CO_2 emissions remained roughly on their prior-year level, at 2.4 million metric tons. Our total energy consumption in 2012 amounted to 6,260 gigawatt hours (previous year: 6,034 gigawatt hours). In 2012, CO_2 emissions relative to value-added were 13 percent lower than in 2007. The Solar Energy division with its very energy-intensive production of monocrystalline solar cells made from pure silicon was included in these statistics for the first time. Without this consolidation, relative CO_2 emissions would have fallen by 17 percent compared to 2007. The fifty-fifty joint ventures BSH Bosch und Siemens Hausgeräte GmbH, ZF Lenksysteme GmbH, and Purolator Filters North America LLC are not included in these consolidated figures.

We also attach very great importance to continuously improving occupational health and safety. In 2012, the total number of occupational accidents was 2,012, compared with 1,913 accidents in 2011. The relative number of occupational accidents per million working hours stands at 4.2 (previous year: 4.0). The Solar Energy division was included in these statistics for the first time, and account was also taken of journeys to work and parking-lot accidents. This figure was well below the current target figure of 4.9, despite a number of new locations. We want to improve these figures in the years ahead. An occupational health and safety program will assist locations in this respect. In addition to our own production-related measures, we also audit the environmental and occupational health and safety standards at our suppliers.

F.10

EBIT by business sector

Bosch Group, 2011 - 2012
Figures in millions of euros



Results of operations

Considerable burdens on operating profit

In 2012, the development of result failed to meet to our expectations. Earnings before interest and tax (EBIT) of 1.3 billion euros and a pre-tax return on sales of 2.5 percent were well below the previous year's results of 2.7 billion euros and 5.3 percent of sales respectively. This unsatisfactory result was attributable to low sales growth caused by the economic downturn, underutilized capacity at some locations, and the delayed impact of cost-cutting measures. One additional factor was the extremely difficult situation in the photovoltaics sector. The loss here, including an impairment of fixed assets of around 600 million euros, amounted to approximately 1 billion euros. The result was also affected by significant upfront investments in projects of future importance, rising raw materials prices, and negative one-off effects from the sale of the foundation brakes business.

At 2.8 billion euros and a return of 5.3 percent of sales, pre-tax earnings were higher than the previous year's figures. However, this meant that we failed to attain our current target for pre-tax earnings of between 7 and 8 percent. Special effects in the financial result, such as the book profit of around 1.1 billion euros from the sale of our financial stake in the Japanese Denso Corporation, make a major contribution to the increases in pre-tax earnings. We used the proceeds from this sale to finance acquisitions. The result after taxes was around 2.3 billion euros, a year-on-year increase compared to the 2011 figure of 1.8 billion euros, which was affected by a special tax payment.

The Automotive Technology business sector generated EBIT of 1.4 billion euros or a return on sales of 4.5 percent. The result was down due to high upfront investments in the growth field of electromobility, increased raw materials prices, and the disposal of the foundation brakes business. The Industrial Technology business sector discloses negative EBIT of some 700 million euros, following an EBIT loss of some 360 million euros in the previous year. Difficulties in the Solar Energy division could not be offset by overall favorable developments in the Drive and Control Technology and Packaging Technology divisions. EBIT in the Consumer Goods and Building Technology business sector amounted to 620 million euros (previous year: roughly 730 million euros). Despite decreases in sales in important European markets, some of them considerable, the decline in result was thus comparatively moderate. However, the EBIT return of 4.6 percent is also unsatisfactory.

Changes in the controlling system

In 2012, we further developed our planning system and main performance indicators by introducing the Bosch Value Concept. Owing to increasing economic uncertainties, the central control parameters are securing value and value creation. Systematically focusing on the main performance indicators of break-even point and free cash flow is intended to make the management of volatility and liquidity more effective. The central control parameter in regard to value creation is the "operational value contribution" which forms the basis for calculating the performance-based part of executives' variable remuneration, from section manager level to board of management. It is also used as the basis for the performance-related bonuses of associates and for management of the portfolio. The central internal reporting instrument is a monthly business report which contains an up-to-date overview of the main performance indicators of the operating units. This report is based on the business plan, which itself is embedded into longer-term strategic corporate planning.

The value contribution target for the Bosch Group has so far been derived from an EBIT target of 7.5 percent and a pre-tax return on sales of between 7 and 8 percent. In the future, we will communicate an EBIT target only. In addition, the EBIT return target will be increased to 8 percent due to our decision to abandon proportionate consolidation for fifty-fifty joint ventures. In our internal and external accounting, the changeover to the at-equity method will be completed in 2013.

The end of proportionate consolidation for fifty-fifty joint ventures will have marked impacts on the future disclosure of business figures. This will mainly affect the current proportionate inclusion of the fifty-fifty joint ventures BSH Bosch und Siemens Hausgeräte GmbH and ZF Lenksysteme GmbH. Instead of proportionate expense and income items, the proportionate result after taxes will be included in the consolidated income statement of the Bosch Group, while sales figures for these companies will no longer be disclosed. As a result of this different treatment of sales and result, the target return on sales has been adjusted to 8 percent. The ending of proportionate consolidation will also have repercussions for the balance sheet figures and other performance indicators such as the number of associates.

Financial position and net assets

Positive free cash flow attained

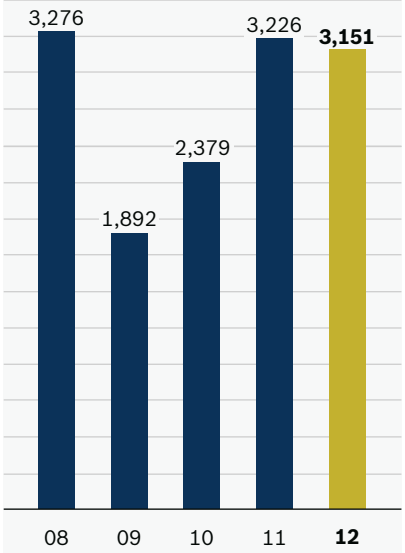
The Bosch Group maintains a sound financial basis. Cash flow amounted to 4.5 billion euros in 2012, or 8.6 percent of sales. Despite the decline in result, free cash flow amounted to approximately 240 million euros. In the second half of the year, we managed to scale back inventories significantly and bring their development into line with the development of sales. We also reduced planned capital expenditure due to the economic situation. In 2012, we spent around 1.5 billion euros on acquisitions and increasing our shareholdings, a much higher figure than in the previous year (400 million euros).

At the end of the year, therefore, our liquidity as per the consolidated statement of cash flows (cash and cash equivalents) was 3.6 billion euros (previous year: 3.3 billion euros). This was mainly due to the sale of Denso shares and increased borrowings. We took a 300-million-euro loan from the European Investment Bank (EIB) and a private placement as part of the bond program amounting to 100 million euros. Liquidity as per the statement of financial position came to 12.6 billion euros. Apart from cash and cash equivalents, this liquidity also includes securities and bank balances with a term of more than 90 days.

F.11

Capital expenditure

Bosch Group, 2008 - 2012
Figures in millions of euros



Consolidated statement of cash flows Figures in millions of euros	2012	2011
Cash flow	**4,538**	4,959
as % of sales	**8.6**	9.6
Liquidity at the beginning of the year (Jan. 1)	3,328	3,821
Cash flows from operating activities	+3,687	+2,717
Cash flows from investing activities	–3,737	–3,613
Cash flows from financing activities	+307	+388
Miscellaneous	+2	+15
Liquidity at the end of the year (Dec. 31)	3,587	3,328

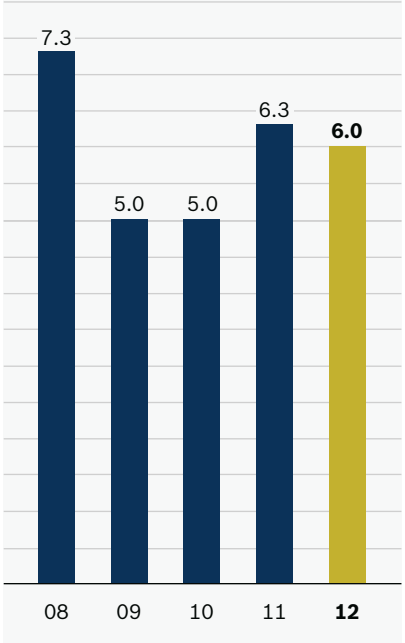
Capital expenditure again on a high level

In 2012, capital expenditure in the Bosch Group came to some 3.2 billion euros. We invested roughly 2 billion euros in our European locations (previous year: 2.1 billion euros). Of this amount, some 1.1 billion euros was spent in Germany, compared with some 1.2 billion euros the previous year. One large-scale project is the future research center in Renningen, close to corporate headquarters. At roughly 780 million euros, capital expenditure in Asia Pacific was slightly below the previous-year level of some 800 million euros. We invested some 380 million euros in the Americas, compared to some 350 million euros in the previous year. Focal points in North America were expansion of the production of injection systems for commercial vehicles and of gasoline direct injection systems for passenger cars.

F.12

Capital expenditure

Bosch Group, 2008 - 2012
% of sales



One of our objectives in the Automotive Technology business sector was further localization of production in eastern Europe and Asia. To this end, we are also using the synergies offered by locations that are home to more than one division. For example, a new location for speed sensors for the Chassis Systems Controls division's safety systems is being constructed in Blaj, Romania, where the Drive and Controls Technology division is already represented. We are also building a new location for electronic control units in Cluj, Romania, and for the assembly of wiper systems in Pećinci, Serbia. In addition, capacity is being extended in China. Examples include the new Automotive Aftermarket location in Nanjing and the laying of the foundation stone for a new location for automotive safety systems in Chengdu. We also made investments worldwide to ramp up products. One important project is the expansion of the semiconductor factory in Reutlingen. In the Industrial Technology business sector, we continued to expand the capacity of our Drive and Control Technology division in China and Turkey. Over a period of several years, the division will substantially expand its location in Fountain Inn, SC (USA), in order to manufacture mobile hydraulic products for customers in the Americas. A research and development center is also being constructed at the manufacturing site in Wujin, China, which was opened in 2012.

The largest investment in the Packaging Technology division was made at the Crailsheim location in Germany, where the production lines for machines for the pharmaceuticals industry are being extended. In Consumer Goods and Building Technology, the new manufacturing facility for abrasives in Switzerland was an important priority for the Power Tools division. The Thermotechnology division focused on increasing capacity in the area of industrial boilers. In the Household Appliances division, we made considerable investments in plants in China, Russia, the United States, and India. We also spent large sums on new generations of appliances.

Favorable development in financial assets despite low interest rates

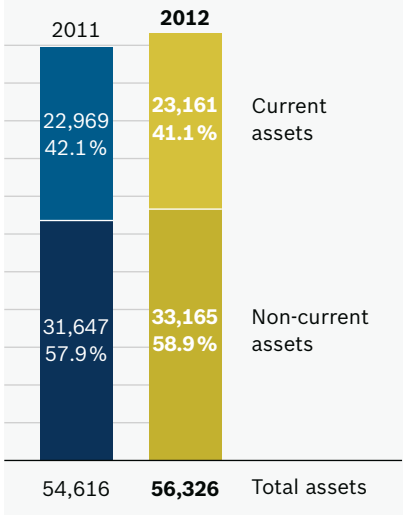
The Bosch Group has a corporate financial and currency management system. This is designed to ensure the group's ability to pay at all times, to control payment flows to optimum effect, and to limit the risks of currency exposures at Bosch Group level. Using business planning as a basis, our foreign exchange balance plan establishes financial and foreign currency flows and hedging requirements in the respective currencies. In principle, currency exposures are hedged at corporate level. In spite of the worsening euro crisis in 2012, currency management was exposed to fewer currency fluctuations than in the previous year.

Central financial management also manages our borrowings and investments. Our investment strategy is therefore aimed at broad diversification of shares and interest-bearing securities. We achieved a good result with our financial investments despite the low interest rates. Our current and non-current external financing instruments also offer high financing flexibility. Standard & Poor's continues to see our long-term rating as AA- (with a "stable" outlook). This ensures easy access to the capital market on attractive terms. Low interest rates were used to borrow funds, and some financial liabilities due in 2013 were refinanced prematurely.

F.13

Structure of the statement of financial position – assets

Bosch Group, 2011 - 2012
Figures in millions of euros/ as a percentage of total assets



Statement of financial position still solid

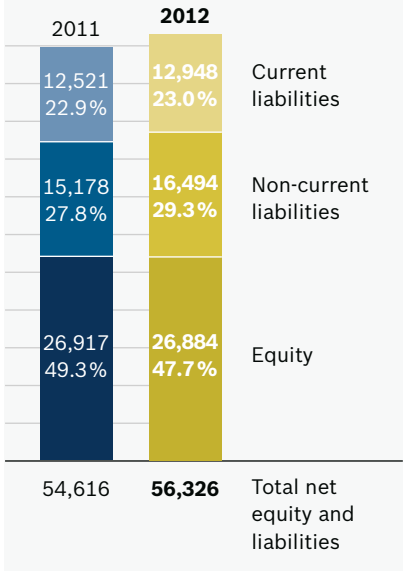
The structure of the statement of financial position remains robust. At balance-sheet date, total assets had risen to 56.3 billion euros, compared with 54.6 billion euros the previous year. On the assets side, the first-time consolidation of acquisitions had a particular impact.

On the equity and liabilities side, there were major changes as a result of a rise in pension provisions to 8.5 billion euros (previous year: 6.9 billion euros). This is attributable to the 1.3 percentage-point reduction in the actuarial interest rate in Europe. It now stands at 3.6 percent, due to the low interest rates in the capital market. At 26.9 billion euros, equity is on the same level as in the previous year. And at 48 percent, the equity ratio was again very good. Due to borrowing activity, our financial liabilities increased to 4.7 billion euros. Our liquidity and securities cover our current and non-current liabilities, and a large proportion of our pension provisions.

F.14

Structure of the statement of financial position – equity and liabilities

Bosch Group, 2011 - 2012
Figures in millions of euros/ as a percentage of total net equity and liabilities



Subsequent events

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

Forecast

Stabilization of global growth environment

Global economic growth had slowed down by the end of 2012. However, early economic indicators improved by the end of the year and suggest that the global economy is stabilizing. We are therefore expecting global economic growth of 2.7 percent, up slightly from the previous year. For the third year in succession, however, global growth will still remain well below the long-term trend of 3.2 to 3.5 percent.

There are still some serious growth risks, primarily on account of high levels of indebtedness in the United States and Europe. Only a few preliminary measures to solve structural problems have been taken in the two regions to date. A moderate economic recovery can be expected in Europe due to greater confidence in the euro, normalization of European financial markets, and stronger global trade. We anticipate slight growth in the European Union in 2013 following the previous year's drop in GDP. Growth opportunities will be limited by continuing reductions in public spending and by unemployment, which has continued to rise in many countries. The recession in southern Europe will continue for at least the first six months of 2013. We expect the U.S. economy to grow by 1.8 percent. This forecast is slightly lower than the figure in 2012, since the government's budget difficulties will probably cause companies and private households to be cautious in their investment and consumption planning.

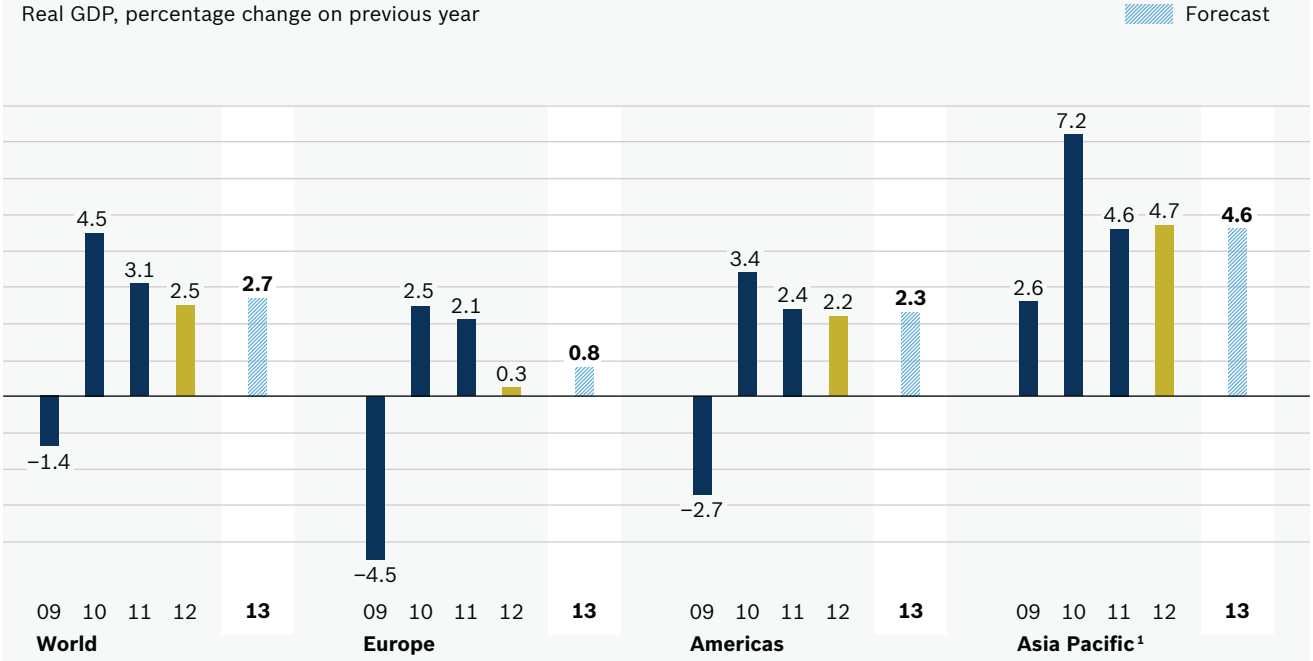
Overall, we forecast growth of around 1.3 percent for developed countries and 5.2 percent for the emerging countries – a slight year-on-year increase in each case. The stabilization of the western European economy will probably have a positive effect on the emerging countries in eastern Europe. In the Asian growth regions, growth is likely to settle at between 6 and 7 percent over the longer term. Economic developments in South America will probably be slightly better than in the previous year. For example, Brazil has launched an extensive investment program. Considerable uncertainty still remains, however.

In the automotive industry, we currently forecast that production figures for passenger cars and light trucks will rise by around 3 percent to just under 84 million units. After the previous year's slump, we expect worldwide production of heavy trucks to recover and rise by approximately 2 to 3 percent to around 3.1 million units. The largest increases in relation to overall production of passenger cars and commercial vehicles will probably take place in Asia Pacific and Russia. We only expect a slight increase in North America, after the double-digit growth last year. Our forecast is that production figures will again fall slightly in Europe.

F.15

Regional economic growth 2009 - 2013

Real GDP, percentage change on previous year



[1] Including other countries

In the capital goods industry, we again anticipate slightly better growth in the developed countries and emerging countries following the slow pace of the previous year. Private demand is expected to remain relatively robust on a global level. Growth rates will likely be slightly higher than in the previous year, especially in the emerging countries. However, it is expected that private consumption in western Europe will stagnate.

With economic outlook remaining subdued, especially in the European market, the Bosch Group's growth prospects will be limited in 2013. However, we will continue to expand our international footprint while endeavoring to further strengthen our market position. Given the continuing high level of uncertainty, our forecast for sales growth ranges between 2 and 4 percent. In the current year as well, there will be extensive consolidation effects. They result from acquisitions made in 2012, changes in investments, and additional follow-up negative effects caused by the disposal of the foundation brakes business and the dissolution of the Kefico joint venture. Due to the ending of proportionate consolidation, the comparative basis for 2012 is a sales figure of 45.6 billion euros.

Although we also want to significantly improve our result, we will not yet reach our target EBIT return of 8 percent. The measures taken include very close control of growth areas and caps on fixed costs, capital expenditure, and company acquisitions. In view of market volatility, it is becoming increasingly important to make personnel costs more flexible. We have already made some initial progress here. In view of the market risks, however, we will continue to intensify our efforts in the operating units around the world. We also see opportunities for growth in sales and result in 2014 thanks to our innovative products and the further extension of our international presence.

Risk report

Comprehensive risk management in the Bosch Group

Risk management within the Bosch Group is based on rules and actions that are laid down in directives. These are reviewed on a regular basis to ensure they are effective and are revised in accordance with the latest statutory regulations. 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 action. The board of management of Robert Bosch GmbH – with support from the corporate departments – is responsible for risks of general relevance.

Processes are in place to ensure that information on relevant risks and opportunities is forwarded to appropriate decision-makers, right up to board of management level. Risk management tools include systematic business field, competition, and regional analyses. Our comprehensive reporting system forms the basis for monthly reports on all commercially and financially relevant matters. In bodies such as the foreign exchange, raw materials, and investment committees, specific risks are examined on a regular basis.

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 binding group-wide chart of accounts, binding standards for bookkeeping systems, group-wide accounting manuals, and group-wide software for recording the necessary data and for consolidation. Changes in legislation or accounting standards are examined with respect to their relevance for 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 through controls and professional 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. Following this, they are consolidated. 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 control system is supplemented

by a system of internal measures which are implemented locally according to uniform group-wide standards, and in which financially critical processes are randomly checked for accuracy.

General risk assessment

On the basis of the information currently available and the individual risks listed in this report, there are no additional recognizable opportunities or risks, apart from market-related opportunities and risks listed in the forecast above, that will materially impair the net assets, financial position, and results of operations of the Bosch Group in fiscal 2013. With regard to economic uncertainty, our broad regional and sectoral presence helps ensure that risks are spread.

The following risk categories are considered in greater detail:

Strategic risks: We systematically and regularly examine the consequences resulting from changes in the markets, the supplier environment, the possible concentration of customers and competitors, and technical developments. For example, the competitive environment for automotive technology will change through the longer-term wide-scale introduction of electric vehicles. A consolidation process is under way in the photovoltaics industry. The development of these future technologies will likely be affected to a large extent by increased exploitation of shale gas and shale oil reserves, but also by government legislation. Furthermore, the worldwide competitive environment is changing as a result of competitors from Asia, who are gaining global market share, as well as new web-based systems solutions and business models.

Operational risks: Even though the debt crisis in Europe has stabilized for the time being, there is a risk that companies with limited financial resources will find it increasingly difficult to obtain loans due to the stricter equity requirements placed on banks. So far, however, we have not identified any significant financing bottlenecks among our suppliers. High raw materials prices still present a risk. We counter this development to some extent through price escalator clauses and forward transactions. Risks continue to be posed by automakers' demands for continued price reductions and by price pressures in the consumer goods segment. Stringent requirements relating to product liability, particularly in the field of automotive technology, also pose a risk which we counter with far-reaching quality assurance strategies and high quality standards. We do not expect any liability risks from the delay of the major Berlin-Brandenburg airport project.

IT risks: We have put in place comprehensive measures valid throughout the company to provide organizational and technical protection against all kinds of data loss, manipulation, and theft. We respond to the growing demands and increasing sensitivity of data protection in social networks by means of a 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.

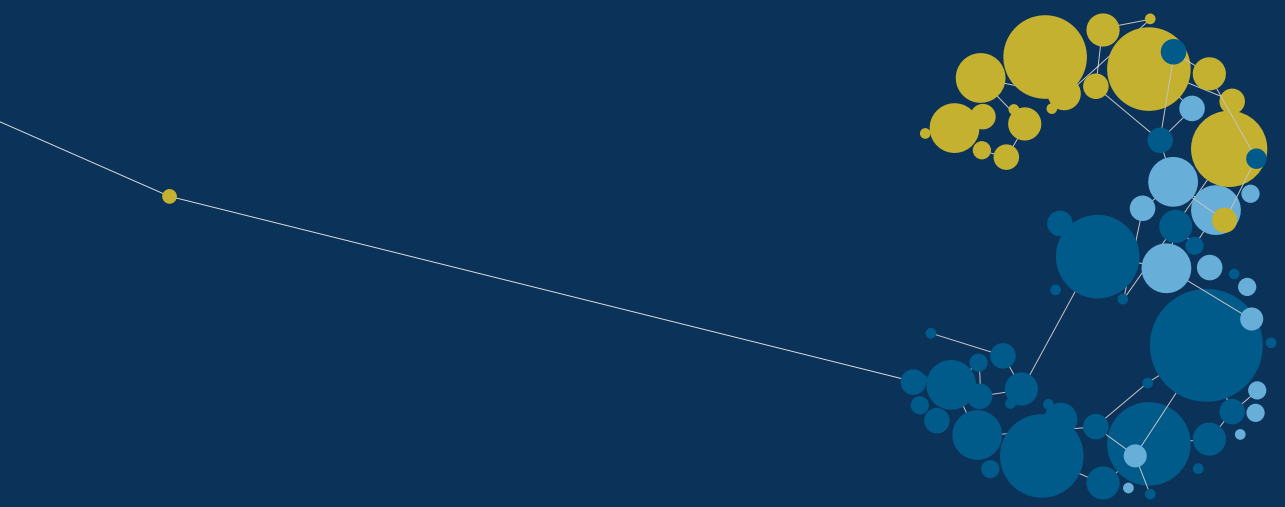
Legal risks, compliance: We do not anticipate any risks as a result of current or impending litigation or compliance issues that could materially impair the net assets, financial position, or results of operations of the Bosch Group in fiscal 2013. The principle of legality is an integral part of Bosch's 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, online training courses, and publications are used to ensure that there is a high level of familiarity with issues such as general compliance or antitrust law within the company. Violations of prevailing law or the Bosch Code of Business Conduct are investigated thoroughly.

Financial risks: The operative business of the Bosch Group is affected by fluctuations in exchange and interest rates. Our strategy of maintaining a strong global presence with local production and worldwide purchasing activities generally reduces currency risks. We also limit these risks by taking precautionary measures at corporate level. Internal regulations and guidelines set down a mandatory framework and define the responsibilities relating to payment transactions, investments, and precautionary activities. According to these regulations, financial tools such as futures trading and interest swaps may only be used in connection with operative 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.

We have substantial 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 detailed description of risk management in relation to financial risks can be found in the notes to the financial statements.

Global risks: We systematically and comprehensively analyze economic, legal, and political developments in individual regions and countries and the risks stemming from incidents such as disasters or the actions of third parties.

Consolidated Financial Statements
of the Bosch Group



Income statement
for the period from January 1 to December 31, 2012

T.01

Figures in millions of euros	Note	2012	2011
Sales revenue	1	**52,464**	**51,494**
Cost of sales		–36,295	–34,547
Gross profit		**16,169**	**16,947**
Distribution and administrative cost	2	–9,961	–9,378
Research and development cost	3	–4,787	–4,190
Other operating income	4	1,384	1,217
Other operating expenses	5	–1,495	–1,887
EBIT		**1,310**	**2,709**
Financial income	6	2,924	1,573
Financial expenses	6	–1,438	–1,654
Profit before tax		**2,796**	**2,628**
Income taxes	7	–454	–808
Profit after tax		**2,342**	**1,820**
of which attributable to non-controlling interests	8	81	74
of which attributable to parent company		2,261	1,746

Statement of comprehensive income for the period from January 1 to December 31, 2012

T.02

Figures in millions of euros	2012	2011
Profit after tax	**2,342**	**1,820**
Change from marketable financial instruments		
recognized in other comprehensive income	535	–466
of which attributable to non-controlling interests	6	
transferred to profit or loss	–1,293	–64
of which attributable to non-controlling interests	–3	–4
Change in actuarial gains and losses for pension provisions	–1,179	–343
of which attributable to non-controlling interests		
Adjustment item from currency translation of entities outside the euro zone	–266	–26
of which attributable to non-controlling interests	–23	–21
Other comprehensive income	**–2,203**	**–899**
Comprehensive income	**139**	**921**
of which attributable to non-controlling interests	61	49
of which attributable to parent company	78	872

Statement of financial position for the year ended December 31, 2012

T.03

Assets Figures in millions of euros	Note	12/31/2012	12/31/2011
Current assets			
Cash and cash equivalents	10	3,587	3,328
Marketable securities	11	760	718
Trade receivables	12	9,169	9,156
Income tax receivables		324	292
Other assets	13	2,153	1,816
Inventories	14	7,168	7,659
		23,161	**22,969**
Non-current assets			
Financial assets	15	9,818	9,942
Income tax receivables		152	139
Property, plant, and equipment	16	13,571	13,776
Intangible assets	17	6,798	5,654
Deferred taxes	7	2,826	2,136
		33,165	**31,647**
Total assets		**56,326**	**54,616**

Equity and liabilities Figures in millions of euros	Note	12/31/2012	12/31/2011
Current liabilities			
Financial liabilities	18	1,364	437
Trade payables	19	4,034	4,241
Income tax liabilities		165	176
Other liabilities	20	4,469	4,566
Income tax provisions		373	413
Other provisions	20	2,543	2,688
		12,948	**12,521**
Non-current liabilities			
Financial liabilities	18	3,297	3,851
Other liabilities	20	279	453
Pension provisions	21	8,534	6,861
Income tax provisions		347	337
Other provisions	20	3,034	2,866
Deferred taxes	7	1,003	810
		16,494	**15,178**
Equity	22		
Issued capital		1,200	1,200
Capital reserve		4,557	4,557
Retained earnings		20,536	20,589
Unappropriated earnings		88	88
Non-controlling interests		503	483
		26,884	**26,917**
Total equity and liabilities		**56,326**	**54,616**

Statement of changes in equity

T.04

Figures in millions of euros			Retained earnings			
	Issued capital	Capital reserve	Earned profit	Treasury stock	Currency translation	
January 1, 2011	**1,200**	**4,557**	**18,180**	**–62**	**554**	
Comprehensive income					–5	
Dividends						
Transfer to retained earnings			1,658			
Other changes						
December 31, 2011	**1,200**	**4,557**	**19,838**	**–62**	**549**	
Comprehensive income					–243	
Dividends						
Transfer to retained earnings			2,173			
Other changes						
December 31, 2012	**1,200**	**4,557**	**22,011**	**–62**	**306**	

Other comprehensive income						
Securities	Other changes	Total	Unappropriated earnings	Equity parent company	Non-controlling interests	Total equity
1,804	**–590**	**1,768**	**82**	**25,725**	**518**	**26,243**
–526	–343	–874	1,746	872	49	921
			–82	–82	–76	–158
			–1,658			
	–81	–81		–81	–8	–89
1,278	**–1,014**	**813**	**88**	**26,434**	**483**	**26,917**
–761	–1,179	–2,183	2,261	78	61	139
			–88	–88	–28	–116
			–2,173			
	–43	–43		–43	–13	–56
517	**–2,236**	**–1,413**	**88**	**26,381**	**503**	**26,884**

Statement of cash flows

T.05

Figures in millions of euros	Note 23	2012	2011
Profit before tax		2,796	2,628
Depreciation and amortization[1)]		3,320	3,287
Change in pension provisions		25	–35
Change in non-current provisions		134	–139
Gains on disposal of non-current assets		–1,183	–59
Losses on disposal of non-current assets		334	85
Gains on disposal of securities		–439	–278
Losses on disposal of securities		94	182
Financial income		–654	–692
Financial expenses		729	812
Interest and dividends received		400	404
Interest paid		–248	–172
Income taxes paid		–770	–1,064
Cash flow		**4,538**	**4,959**
Change in inventories		555	–819
Increase in receivables and other assets		–364	–1,037
Change in liabilities		–785	109
Decrease in current provisions		–257	–495
Cash flows from operating activities (A)		**3,687**	**2,717**
Acquisition of subsidiaries and other operating units		–1,060	–26
Disposal of subsidiaries and other operating units		76	
Additions to non-current assets		–4,083	–3,851
Proceeds from disposal of non-current assets		1,263	244
Purchase of securities		–5,894	–7,603
Disposal of securities		5,961	7,623
Cash flows from investing activities (B)		**–3,737**	**–3,613**
Acquisition of non-controlling interests		–40	–61
Borrowing		1,291	1,195
Repayment of financial liabilities		–828	–588
Dividends paid		–116	–158
Cash flows from financing activities (C)		**307**	**388**
Change in liquidity (A+B+C)		**257**	**–508**
Liquidity at the beginning of the period (January 1)		**3,328**	**3,821**
Exchange-rate related change in liquidity		–6	14
Increase in liquidity due to changes in the consolidated group		8	1
Liquidity at the end of the period (December 31)		**3,587**	**3,328**

[1] After offsetting write-ups of EUR 91 million (previous year: EUR 41 million)

Notes to the consolidated financial statements
Principles and methods

General explanations

The consolidated financial statements of the Bosch Group for the year ended December 31, 2012, have been prepared according to the standards issued by the International Accounting Standards Board (IASB), London. The International Financial Reporting Standards (IFRSs) and the Interpretations of the IFRS Interpretations Committee (IFRIC) applicable in the EU at 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 endorsed by the EU in IAS 1 *Presentation of Financial Statements* (mandatory adoption for fiscal years beginning on or after July 1, 2012), IAS 19 *Employee Benefits* (mandatory adoption for fiscal years beginning on or after January 1, 2013), IAS 27 *Separate Financial Statements*, IAS 28 *Investments in Associates and Joint Ventures* (mandatory adoption for fiscal years beginning on or after January 1, 2014), IAS 32 *Financial Instruments*: *Presentation,* and IFRS 7 *Financial Instruments: Disclosures* (mandatory adoption for fiscal years beginning on or after January 1, 2013) will not be early adopted.

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, 2012, were authorized for disclosure by management on March 7, 2013. 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. Remaining 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 consolidated proportionately.

Pursuant to IAS 28 *Investments in Associates*, investments are included in consolidation using the equity method if significant influence can be exercised. At present, no entity has 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 revaluations are recorded in profit or loss.

The financial statements of the consolidated companies outside the euro zone are translated into euros in accordance with IAS 21 *The Effects of Changes in Foreign Exchange Rates*. Assets and liabilities are translated at the closing rate 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 =	12/31/2012	12/31/2011	2012	2011
Australia	AUD	1.27	1.27	1.24	1.35
Brazil	BRL	2.70	2.42	2.51	2.33
China	CNY	8.32	8.16	8.11	9.00
Czech Republic	CZK	25.14	25.80	25.14	24.58
Hungary	HUF	291.29	311.13	289.32	279.29
India	INR	72.56	68.71	68.60	64.89
Japan	JPY	113.61	100.20	102.49	110.94
Korea	KRW	1,406.04	1,498.69	1,448.82	1,541.28
Poland	PLN	4.07	4.42	4.19	4.11
Russian Federation	RUB	40.23	41.67	39.95	40.87
Switzerland	CHF	1.21	1.22	1.21	1.23
Turkey	TRY	2.36	2.44	2.31	2.34
United Kingdom	GBP	0.82	0.84	0.81	0.87
USA	USD	1.32	1.29	1.28	1.39

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. This does not apply to derivative financial instruments. 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.

Inventories include raw materials, consumables, and supplies, as well as 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 - 33 years
Plant and equipment	6 - 14 years
Other equipment, fixtures, and furniture	3 - 12 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 cost 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 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.

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. Fair value is the market value. If it is not possible to reliably determine a market value, the fair value is determined using actuarial methods based on available market information (the most common methods are the discounted cash flow method and the Black-Scholes model). The fair values needed to present the market values required by IFRS 7 *Financial Instruments: Disclosures* are determined in the same way. 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 anticipated credit risks 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, 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, legal, or market environment 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, affects 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.

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 items of the statement of financial position.

Pursuant to IAS 37 *Provisions, Contingent Liabilities, and Contingent Assets*, **other provisions** are recognized if there is a current obligation from a past event which will probably lead to an outflow of resources 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.

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 361 (previous year: 349) fully consolidated companies. The group developed as follows:

T.08

	Germany	Outside Germany	Total
Included in consolidation at December 31, 2010	**59**	**302**	**361**
Additions/formations in fiscal year 2011	3	15	18
Disposals/mergers in fiscal year 2011	3	26	29
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**

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 2012, the following companies were included in the consolidation for the first time:

- Ampack Ammann GmbH, Königsbrunn, Germany,
- Bosch Power Tec GmbH, Hamburg, Germany,
- Bosch Software Innovations GmbH, Immenstaad, Germany,
- Eisai Machinery GmbH, Cologne, Germany,
- Ingenieurbüro Ammann GmbH, Königsbrunn, Germany,
- Robert Bosch Battery Systems GmbH, Stuttgart, Germany,
- Robert Bosch Lizenzverwaltungsgesellschaft mbH, Holzkirchen, Germany,
- Robert Bosch Centro de Comunicação Ltda., Campinas, Brazil,
- Bosch Gardening Equipment (Ningbo) Co., Ltd., Yuyao City, China,
- Bosch Packaging Technology (Chengdu) Co., Ltd., Chengdu, China,
- Bosch Thermotechnology (Beijing) Co., Ltd., Beijing, China,
- Eisai Machinery Shanghai Co., Ltd., Shanghai, China,
- Taixiang Vehicle Replace Parts (Shenzhen) Co., Ltd., Shenzhen, China,
- aleo solar distribuzione Italia S.r.l., Milan, Italy,
- Eisai Machinery Co., Ltd., Tokyo, Japan,
- Bosch Solar Energy (Malaysia) Sdn. Bhd., Penang, Malaysia,
- Robert Bosch IC Financing Malta Ltd., St. Julians, Malta,
- Robert Bosch Licensing Administration C.V., Boxtel, Netherlands,
- OOO “Construction & investments”, Khimki, Russian Federation,
- Robert Bosch Taiwan Co., Ltd., Taipei, Taiwan,
- Unipoint Electric MFG Co., Ltd., Taipei, Taiwan,
- Robert Bosch Middle East FZE, Dubai, United Arab Emirates,
- Bosch Solar Energy Corp., Detroit, MI, United States of America,
- BSE PV LLC, Palo Alto, CA, United States of America,
- Eisai Machinery U.S.A. Inc., Allendale, NJ, United States of America,
- Robert Bosch Battery Systems LLC, Orion, MI, United States of America,
- Service Solutions US LLC, Warren, MI, United States of America (the subgroup consists of 12 companies).

Due to corporate restructuring and mergers, the number of subsidiaries included in consolidation was reduced by a total of 46.

Due to changes to the consolidated group, sales revenue decreased by EUR 256 million and total assets increased by EUR 707 million.

Proportionate consolidation

The following companies are joint ventures. In accordance with IAS 31, the financial statements have therefore been included proportionate to the share Bosch holds in their capital:

- BSH Bosch und Siemens Hausgeräte GmbH (50 percent), Munich, Germany (the subgroup consists of 73 companies),
- ZF Lenksysteme GmbH (50 percent), Schwäbisch Gmünd, Germany (the subgroup consists of 14 companies),
- United Automotive Electronic Systems Co., Ltd. (51 percent), Shanghai, China,
- Purolator Filters North America LLC (50 percent), Fayetteville, NC, USA.

The proportionate consolidation of these companies had the following impact on the assets, liabilities, and income and expenses of the Bosch Group:

Effects of proportionate consolidation on assets and liabilities

T.09

Figures in millions of euros	2012	2011
Current assets	3,305	3,366
Non-current assets	1,984	1,736
Current liabilities	2,037	2,187
Non-current liabilities	1,718	1,415

Effects of proportionate consolidation on the income statement

T.10

Figures in millions of euros	2012	2011
Income	7,986	7,782
Expenses	7,636	7,397

The share of contingent liabilities of these companies attributable to the Bosch Group amounts to EUR 8 million (previous year: EUR 2 million).

If IFRS 11 had been early adopted in the Bosch Group, sales revenue in the fiscal year 2012 would have been around EUR 7.3 billion lower and total assets around EUR 3.7 billion lower.

From the beginning of fiscal year 2013, Robert Bosch GmbH has the possibility to control United Automotive Electronic Systems Co., Ltd., Shanghai, China. From January 1, 2013, this company will therefore be included in the consolidated financial statements of the Bosch Group as a subsidiary.

Business combinations

The companies listed below were acquired and included in the consolidation for the first time in the reporting period:

T.11

Figures in millions of euros					
Company	**Activity and absorbing business sector**	**First-time consolidation**	**Share of voting rights**	**Acquisition cost**	**Profit share since first-time consolidation**
Unipoint group, Taipei, Taiwan	Starters, generators, wiper blades for the aftermarket UBK	Jan. 1, 2012	100 %	85	–2
Eisai Machinery group, Tokyo, Japan	Inspection machinery UBI	Apr. 1, 2012	100 %	56	0
Ampack Ammann, Königsbrunn, Germany	Packaging machinery UBI	Oct. 1, 2012	100 %	69	5
Service Solutions group, Warren, MI, USA	Diagnostic equipment UBK	Dec. 1, 2012	100 %	849	–20

The business combinations listed above were mainly funded by cash transfer.

At the time of first-time consolidation, the acquisitions had the following impact on the assets and liabilities of the Bosch Group:

T.12

Figures in millions of euros	Unipoint	Eisai Machinery	Ampack Ammann	Service Solutions	Total	Total of carrying amounts acquired
Current assets	**84**	**43**	**44**	**322**	**493**	**475**
of which cash and cash equivalents	4	7	10	10	31	31
Non-current assets	**76**	**49**	**84**	**882**	**1,091**	**78**
Financial assets				2	2	2
Property, plant, and equipment	40	2	11	29	82	64
Intangible assets	35	45	70	847	997	2
of which goodwill	9	27	33	348	417	
Deferred tax assets	1	2	3	4	10	10
Current liabilities	**64**	**26**	**47**	**193**	**330**	**331**
Non-current liabilities	**11**	**10**	**12**	**162**	**195**	**16**
Provisions				9	9	9
Liabilities including deferred taxes	11	10	12	153	186	7

Acquisitions led to the disclosure of intangible assets (without goodwill) previously not accounted for. These assets amount to EUR 25 million at Unipoint, EUR 18 million at Eisai Machinery, EUR 36 million at Ampack Ammann, and EUR 499 million at Service Solutions.

The purchase price allocation following the acquisition of Service Solutions was not yet completed as of December 31, 2012. Adjustments to the fair values of the intangible assets may result in changes.

Other acquisitions in the reporting period included voltwerk electronics GmbH, Hamburg, Germany, Robert Bosch Battery Systems GmbH (formerly SB LiMotive Germany GmbH), Stuttgart, Germany, as well as Robert Bosch Battery Systems LLC (formerly Cobasys LLC), Orion, MI, USA, for a total purchase price of EUR 35 million. Cash and cash equivalents of EUR 3 million were taken over in the course of these acquisitions.

Assuming that the above companies had already been consolidated for the first time as of January 1, 2012, total sales revenue of the Bosch Group would come to EUR 53,216 million and profit after tax to EUR 2,289 million.

Discontinued operations

No decisions were taken during the reporting period which would have resulted in business units, subsidiaries, or joint ventures being classified as held for sale.

Notes to the income statement

1 Sales revenue

Sales revenue amounted to EUR 52,464 million (previous year: EUR 51,494 million). The Automotive Technology business sector accounted for EUR 31,047 million (previous year: EUR 30,404 million) of this total, the Industrial Technology business sector for EUR 8,017 million (previous year: EUR 8,038 million), and the Consumer Goods and Building Technology business sector for EUR 13,358 million (previous year: EUR 13,029 million). Sales revenue that cannot be allocated to the business sectors came to EUR 42 million (previous year: EUR 23 million).

2 Distribution cost and administrative expenses

T.13

Figures in millions of euros	2012	2011
Administrative expenses	2,714	2,468
Distribution cost	7,247	6,910
	9,961	**9,378**

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.14

Figures in millions of euros	2012	2011
Total research and development cost	4,875	4,189
Development cost recognized in the reporting period	–212	–134
Depreciation on recognized development cost	124	135
	4,787	**4,190**

4 Other operating income

T.15

Figures in millions of euros	2012	2011
Income from exchange-rate fluctuations	691	553
Income from the reversal of valuation allowances on receivables and other assets	51	59
Income from the disposal of non-current assets	58	56
Income from rent and leases	12	13
Income from the reversal of provisions (not disclosed in functional areas)	57	133
Sundry other operating income	515	403
	1,384	**1,217**

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 76 million (previous year: EUR 62 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.16

Figures in millions of euros	2012	2011
Expenses from exchange-rate fluctuations	611	683
Valuation allowances on receivables and other assets	115	160
Expenses from the disposal of non-current assets	118	84
Other taxes	46	34
Expenses from the recognition of provisions	168	167
Impairment of goodwill		498
Sundry other operating expenses	437	261
	1,495	**1,887**

Sundry other operating expenses contain negative effects of the sale of the global foundation brakes business (Automotive Technology business sector) amounting to EUR 196 million. The transaction consisted of the sale of land, buildings, production facilities, receivables, and inventories of EUR 419 million and the transfer of liabilities and provisions of EUR 448 million.

6 Financial result

T.17

Figures in millions of euros	2012	2011
Investment income	3	28
Gains on disposal of investments	1,104	3
Income from investments	**1,107**	**31**
Interest and similar income	365	392
Interest and similar expenses	–239	–274
Interest result	**126**	**118**
Gains on disposal of securities	439	278
Losses on disposal of securities	–94	–182
Exchange-rate gains	615	585
Exchange-rate losses	–634	–607
Gains on derivatives	346	240
Losses on derivatives	–280	–366
Other income	52	47
Other expenses	–191	–225
Other financial result	**253**	**–230**
Financial result, total	**1,486**	**–81**
of which financial income	2,924	1,573
of which financial expenses	–1,438	–1,654

Gains on disposal of investments contain an amount of EUR 1,099 million relating to the sale of shares in Denso Corporation, Kariya-shi, Japan.

The positions gains/losses on derivatives contain transactions to hedge financial assets. The position other expenses contains impairments of securities totaling EUR 8 million (previous year: EUR 34 million).

Capitalized borrowing costs of EUR 13 million (previous year: EUR 7 million) were deducted from interest expenses. The underlying borrowing rate is 4.5 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.18

Figures in millions of euros	2012		2011	
	Interest income	Interest expenses	Interest income	Interest expenses
Loans and receivables	101		113	
Held-to-maturity investments	1		1	
Available-for-sale financial assets	260	25	276	28
Financial liabilities measured at amortized cost		214		246

The interest result of the “available-for-sale financial assets” category contains dividend income from equity instruments held, totaling EUR 71 million (previous year: EUR 68 million).

7 Income taxes

Income taxes are classified according to their origin as follows:

T.19

Figures in millions of euros	2012	2011
Current taxes	729	1,042
Deferred taxes	–275	–234
Income taxes	**454**	**808**

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, deferred tax assets and liabilities are allocable to the following items in the statement of financial position:

T.20

Figures in millions of euros	2012		2011	
	Assets	Liabilities	Assets	Liabilities
Receivables, other assets, and inventories	467	171	455	254
Securities, investments	10	356	5	269
Property, plant, and equipment	299	531	172	559
Intangible assets	135	539	84	364
Other assets	71		124	1
Liabilities	381	37	490	41
Provisions	1,815	42	1,387	50
Other liabilities	1	21	1	44
Unused tax losses and tax credits	865		664	
Gross amount	**4,044**	**1,697**	**3,382**	**1,582**
Valuation allowances	–524		–474	
Netting	–694	–694	–772	–772
	2,826	**1,003**	**2,136**	**810**

There are EUR 1,278 million in unused tax losses for which no deferred tax assets have been recognized (previous year: EUR 959 million). Within the next three years, EUR 16 million (previous year: EUR 18 million) will be forfeited.

Consolidation measures give rise to deferred tax assets of EUR 153 million (previous year: EUR 154 million) and deferred tax liabilities of EUR 15 million (previous year: EUR 15 million).

In the reporting period, changed tax rates in the Bosch Group resulted in a deferred tax asset of EUR 12 million (previous year: EUR 10 million).

In the reporting period, deferred taxes of EUR 394 million (previous year: EUR 47 million) were recorded as other comprehensive income. Of this amount, EUR 60 million (previous year: EUR 1 million) reduces the surplus from securities and EUR 454 million increases the retained earnings due to the change in actuarial parameters in accordance with IAS 19 (previous year: EUR 48 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.21

Figures in millions of euros	2012	2011
Profit before tax	2,796	2,628
Expected income tax expense	811	762
Variances due to tax rate	–141	–21
Non-deductible expenses	114	239
Zero-rated income	–447	–179
Other differences	117	7
Income tax expense disclosed	**454**	**808**
Effective tax rate	16 %	31 %

Effective tax expenses that relate to other periods of EUR 99 million were incurred in the fiscal year; they are contained in the position “other differences.”

8 Non-controlling interests

Profits attributable to non-controlling interests amount to EUR 90 million (previous year: EUR 94 million). This is counterbalanced by losses of EUR 9 million (previous year: EUR 20 million).

9 Other notes to the income statement

The income statement contains personnel expenses of EUR 15,663 million (previous year: EUR 14,719 million).

Cost of materials amounted to EUR 24,250 million (previous year: EUR 23,481 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.22

Figures in millions of euros	2012	2011
Bank balances (term up to 90 days)	3,565	3,287
Cash and reserve bank deposits	22	41
	3,587	**3,328**

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.23

Figures in millions of euros	2012	2011
Trade receivables	9,169	9,156
of which not impaired and not past due at the end of the reporting period	1,916	1,963
of which not impaired and past due at the end of the reporting period	179	129
for less than one month	143	97
for more than one month, but less than three months	22	22
for more than three months	14	10

The carrying amount of trade receivables contains allowances for specific doubtful debts of EUR 285 million (previous year: EUR 281 million) and for general credit risks of EUR 228 million (previous year: EUR 227 million).

Trade receivables totaling EUR 11 million (previous year: EUR 14 million) are due in more than one year.

13 Other assets (current)

T.24

Figures in millions of euros	2012	2011
Bank balances (term of more than 90 days)	204	131
Loan receivables	394	283
Receivables from finance leases	28	28
Positive market values from derivatives	56	56
Prepaid expenses	167	142
Receivables from tax authorities (without income tax receivables)	800	719
Receivables from board of management, associates	48	41
Sundry other receivables	456	416
	2,153	**1,816**

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.25

Figures in millions of euros	2012	2011
Gross capital expenditures on finance leases		
due not later than one year	38	37
due later than one year and not later than five years	114	114
due later than five years	52	54
	204	**205**
Present value of outstanding minimum lease payments		
due not later than one year	28	28
due later than one year and not later than five years	93	92
due later than five years	46	48
	167	**168**
Unearned finance income	**37**	**37**

There were no unguaranteed residual values. It was not necessary to write down any lease receivables.

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.26

Figures in millions of euros	2012	2011
Due not later than one year	36	40
Due later than one year and not later than five years	108	119
Due later than five years	45	49
	189	**208**

14 Inventories

T.27

Figures in millions of euros	2012	2011
Raw materials, consumables, and supplies	2,224	2,504
Work in process	1,318	1,280
Finished goods and merchandise	3,356	3,590
Prepayments	270	285
	7,168	**7,659**

Of the total amount of inventories, an amount of EUR 255 million (previous year: EUR 288 million) is carried at the lower net selling price. In the fiscal year, impairment losses of EUR 21 million (previous year: EUR 109 million) were recognized in profit or loss. No inventories were pledged.

15 Non-current financial assets

T.28

Figures in millions of euros	2012	2011
Securities	8,006	7,590
Investments	1,164	1,845
Other financial assets	648	507
	9,818	**9,942**

Held-to-maturity investments

T.29

Figures in millions of euros	2012	2011
Due later than five years	7	7
	7	**7**

The financial investments held to maturity have a market value of EUR 7 million (previous year: EUR 7 million).

Other non-current financial assets

T.30

Figures in millions of euros	2012	2011
Loan receivables	245	98
Receivables from finance leases	139	140
Other receivables and other assets	264	269
	648	**507**

There are no loans or other receivables due in more than five years.

The carrying amount of loan receivables contains allowances for specific risks of EUR 1 million (previous year: EUR 9 million) and for general credit risks of EUR 5 million (previous year: EUR 3 million).

Of the loan receivables and receivables from finance leases (both current and non-current), an amount of EUR 436 million (previous year: EUR 300 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.

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 539 million (previous year: EUR 370 million). They are used to secure bank guarantees. Medium-term interest-bearing securities and units equivalent at least to the value of the claims from the bank-guarantee obligations were used for pledging.

Non-current securities and investments developed as follows:

T.31

Figures in millions of euros	Available-for-sale financial assets				Held-to-maturity investments	Total
	Investments		Securities		Securities	
	measured at fair value	measured at cost	Shares	Other		
Gross values 1/1/2011	**1,369**	**870**	**2,284**	**5,105**	**7**	**9,635**
Changes in consolidated group		–95				–95
Additions	5	296	1,156	5,051		6,508
Reclassifications				–515		–515
Disposals		–10	–1,373	–3,913		–5,296
Revaluations	–257		–213	41		–429
Exchange differences		7	–4	–36		–33
Gross values 12/31/2011	**1,117**	**1,068**	**1,850**	**5,733**	**7**	**9,775**
Depreciation 1/1/2011		**266**				**266**
Additions		74				74
Disposals		–1				–1
Exchange differences		1				1
Depreciation 12/31/2011		**340**				**340**
Carrying amounts 12/31/2011	**1,117**	**728**	**1,850**	**5,733**	**7**	**9,435**
Gross values 1/1/2012	**1,117**	**1,068**	**1,850**	**5,733**	**7**	**9,775**
Changes in consolidated group		50				50
Additions	242	287	1,365	3,611		5,505
Reclassifications		–1		–864		–865
Disposals	–985	–283	–1,362	–2,863		–5,493
Revaluations	72		288	260		620
Exchange differences	–1	–8	–7	–12		–28
Gross values 12/31/2012	**445**	**1,113**	**2,134**	**5,865**	**7**	**9,564**
Depreciation 1/1/2012		**340**				**340**
Changes in consolidated group		127				127
Additions		55				55
Disposals		–127				–127
Exchange differences		–1				–1
Depreciation 12/31/2012		**394**				**394**
Carrying amounts 12/31/2012	**445**	**719**	**2,134**	**5,865**	**7**	**9,170**

16 Property, plant, and equipment

T.32

Figures in millions of euros	Land, buildings belonging to operating assets	Investment property	Plant and equipment	Other equipment, fixtures and furniture, leased assets	Prepayments and assets under construction	Total
Gross values 1/1/2011	**7,738**	**149**	**18,744**	**7,283**	**1,168**	**35,082**
Changes in consolidated group	8		–15	2	9	4
Additions	228		1,101	664	1,233	3,226
Reclassifications	203	6	529	150	–888	
Disposals	–91		–876	–516	–80	–1,563
Exchange differences	69		–54	–6	11	20
Gross values 12/31/2011	**8,155**	**155**	**19,429**	**7,577**	**1,453**	**36,769**
Depreciation 1/1/2011	**3,197**	**62**	**13,446**	**5,364**	**13**	**22,082**
Changes in consolidated group	1		–22	–4		–25
Additions	211	3	1,351	697	3	2,265
Reclassifications	13	–1	–24	18	–6	
Disposals	–56		–790	–461	–1	–1,308
Write-ups	–11		–29	–1		–41
Exchange differences	39		–24	4	1	20
Depreciation 12/31/2011	**3,394**	**64**	**13,908**	**5,617**	**10**	**22,993**
Carrying amounts 12/31/2011	**4,761**	**91**	**5,521**	**1,960**	**1,443**	**13,776**
Gross values 1/1/2012	**8,155**	**155**	**19,429**	**7,577**	**1,453**	**36,769**
Changes in consolidated group	–119		–521	–53	–61	–754
Additions	181	2	954	621	1,393	3,151
Reclassifications	172	2	715	194	–1,083	
Disposals	–150	–9	–948	–524	–37	–1,668
Exchange differences	–133	1	–258	–43	–12	–445
Gross values 12/31/2012	**8,106**	**151**	**19,371**	**7,772**	**1,653**	**37,053**
Depreciation 1/1/2012	**3,394**	**64**	**13,908**	**5,617**	**10**	**22,993**
Changes in consolidated group	–77		–499	–64		–640
Additions	427	3	1,766	726	26	2,948
Reclassifications	–22	5	9	8		
Disposals	–78	–2	–851	–479		–1,410
Write-ups	–11		–77	–2		–90
Exchange differences	–78		–210	–31		–319
Depreciation 12/31/2012	**3,555**	**70**	**14,046**	**5,775**	**36**	**23,482**
Carrying amounts 12/31/2012	**4,551**	**81**	**5,325**	**1,997**	**1,617**	**13,571**

The total depreciation charge contains the following impairment losses:

- Land and buildings: EUR 188 million (previous year: EUR 4 million)
- Plant and equipment: EUR 371 million (previous year: EUR 42 million)
- Other equipment, furniture, and fixtures: EUR 47 million (previous year: EUR 4 million)

Overcapacity in the photovoltaics market and keen competition from Asian suppliers and the associated drop in prices of up to 40 percent compared to the previous year led to impairment losses in the Solar Energy division in the reporting period. Impairment losses on land and buildings in this division came to EUR 174 million and on other property, plant, and equipment to EUR 406 million.

The impairment test was carried out at division 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 26 million (previous year: EUR 28 million)
- Plant and equipment: EUR 4 million (previous year: EUR 7 million)
- Other equipment, furniture, and fixtures: EUR 12 million (previous year: EUR 14 million)

The obligations entered into to purchase items of property, plant, and equipment amounted to EUR 433 million (previous year: EUR 418 million), restrictions on title totaled EUR 29 million (previous year: EUR 60 million). Government grants for assets of EUR 41 million (previous year: EUR 25 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 147 million (previous year: EUR 156 million). The fair values were determined on the basis of freely available representative lists of market rents and on the basis of the company's own estimates. The rental income from investment property came to EUR 10 million (previous year: EUR 9 million), maintenance expenses totaled EUR 5 million (previous year: EUR 4 million).

17 Intangible assets

T.33

Figures in millions of euros	Acquired intangible assets (without goodwill)	Acquired goodwill	Internally generated intangible assets	Total
Gross values 1/1/2011	**2,561**	**4,850**	**1,021**	**8,432**
Changes in consolidated group	19	29		48
Additions	135	2	187	324
Disposals	–83		–270	–353
Exchange differences	25	3		28
Gross values 12/31/2011	**2,657**	**4,884**	**938**	**8,479**
Amortization 1/1/2011	**1,292**	**269**	**604**	**2,165**
Changes in consolidated group	7			7
Additions	311	498	180	989
Disposals	–77		–270	–347
Exchange differences	15	–4		11
Amortization 12/31/2011	**1,548**	**763**	**514**	**2,825**
Carrying amounts 12/31/2011	**1,109**	**4,121**	**424**	**5,654**
Gross values 1/1/2012	**2,657**	**4,884**	**938**	**8,479**
Changes in consolidated group	561	556	–6	1,111
Additions	142		261	403
Disposals	–100		–114	–214
Exchange differences	–16			–16
Gross values 12/31/2012	**3,244**	**5,440**	**1,079**	**9,763**
Amortization 1/1/2012	**1,548**	**763**	**514**	**2,825**
Changes in consolidated group	–31	–4	–6	–41
Additions	247		160	407
Disposals	–100		–114	–214
Write-ups	–1			–1
Exchange differences	–10	–1		–11
Amortization 12/31/2012	**1,653**	**758**	**554**	**2,965**
Carrying amounts 12/31/2012	**1,591**	**4,682**	**525**	**6,798**

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

- Purchased intangible assets (without goodwill): EUR 7 million (previous year: EUR 66 million)
- Internally generated intangible assets: EUR 16 million (previous year: EUR 24 million)

The goodwill of EUR 4,682 million (previous year: EUR 4,121 million) is attributable to the business sectors as follows: Automotive Technology EUR 556 million (previous year: EUR 103 million), Industrial Technology EUR 2,292 million (previous year: EUR 2,223 million), Consumer Goods and Building Technology EUR 1,802 million (previous year: EUR 1,795 million). Goodwill that cannot be allocated to the business sectors came to EUR 32 million (previous year: EUR 0 million).

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 determined on the basis of 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), and for Consumer Goods and Building Technology 2.0 percent (previous year: 2.0 percent). For the Automotive Technology business sector, a pre-tax discount rate of 9.5 percent (previous year: 9.2 percent) was applied, for Industrial Technology 10.2 percent (previous year: 10.1 percent), and for Consumer Goods and Building Technology 10.3 percent (previous year: 10.4 percent). A risk-free interest rate of 2.1 percent (previous year: 2.7 percent) and a market risk premium of 5.5 percent (previous year: 5.0 percent) were assumed. The standard tax rate used is 29 percent (previous year: 29 percent).

In the reporting period, the annual impairment test did not give rise to any impairment requirement for goodwill.

18 Current and non-current financial liabilities

T.34

Figures in millions of euros	2012		2011	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Bonds	700	1,946		2,472
Promissory loans		575		499
Liabilities to banks	661	760	383	858
Other financial liabilities	3	16	54	22
	1,364	**3,297**	**437**	**3,851**

Financial liabilities amounting to EUR 828 million (previous year: EUR 1,370 million) are due in more than five years.

Terms and conditions of the major bonds

T.35

					Figures in millions of euros	
Interest terms	**Interest rate**	**Beginning of term**	**End of term**	**Currency**	**Nominal**	**Fair value 12/31/2012**
Fixed	4.375%	05/2006	05/2016	EUR	750	844
Fixed	3.750%	06/2009	06/2013	EUR	700	711
Fixed	5.125%	06/2009	06/2017	EUR	600	716
Fixed	5.000%	08/2009	08/2019	EUR	300	375
Fixed	1.543%	08/2012	08/2017	EUR	100	100

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

T.36

Figures in millions of euros	Carrying amount	Undiscounted cash flows					
	2012	2013	2014	2015	2016	2017	2018 ff.
Non-derivative financial liabilities							
Bonds	2,646	794	138	103	860	781	367
Promissory loans	575	23	359	33	10	63	166
Liabilities to banks	1,421	701	62	75	46	294	350
Other financial liabilities	919	861	30	14	11	5	15
Finance lease obligations	24	11	6	4	2	3	10
Derivative financial liabilities	76	49	10	1	16	0	1

Figures in millions of euros	Carrying amount	Undiscounted cash flows					
	2011	2012	2013	2014	2015	2016	2017 ff.
Non-derivative financial liabilities							
Bonds	2,472	109	794	134	81	857	987
Promissory loans	499	21	21	358	9	9	175
Liabilities to banks	1,241	425	480	74	65	27	290
Other financial liabilities	908	803	47	37	19	12	17
Finance lease obligations	30	16	6	5	3	2	15
Derivative financial liabilities	305	315	40	8	20	1	1

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.

For the derivatives presented under derivative financial liabilities for which gross settlement has been agreed, the undiscounted cash outflows are netted against the corresponding cash inflows.

19 Trade payables

T.37

Figures in millions of euros	2012	2011
Trade payables	3,983	4,148
Notes payable	51	93
	4,034	**4,241**

There are no trade payables which are due in more than one year (previous year: EUR 2 million).

20 Other liabilities and provisions

Other liabilities

T.38

Figures in millions of euros	2012		2011	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Loans	99	41	102	67
Accruals in the personnel area	1,372		1,532	
Accruals in the sales and marketing area	644		557	
Other accruals	354		388	
Deferred income	166		122	
Tax liabilities (without income tax liabilities)	403		393	
Finance lease obligations	8	16	10	20
Deferred income from tooling compensation received	27	80	32	104
Prepayments received for inventories	598		555	
Sundry other liabilities	798	142	875	262
	4,469	**279**	**4,566**	**453**

Loans with a residual term of more than five years amount to EUR 2 million (previous year: EUR 5 million). The sundry other liabilities with a residual term of more than five years amount to EUR 5 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.39

Figures in millions of euros	2012	2011
Future minimum lease payments		
due not later than one year	10	12
due later than one year and not later than five years	18	20
due later than five years	12	16
Interest portion contained in the future minimum lease payments		
due not later than one year	2	2
due later than one year and not later than five years	7	7
due later than five years	7	9
Present value of outstanding minimum lease payments		
due not later than one year	8	10
due later than one year and not later than five years	11	13
due later than five years	5	7
	24	**30**

Provisions (without income tax provisions and pension provisions)

T.40

Figures in millions of euros	2012		2011	
	up to 1 year	more than 1 year	up to 1 year	more than 1 year
Tax provisions (without income tax provisions)	28	86	36	81
Provisions in the personnel area	477	1,122	595	994
Provisions in the sales and marketing area	1,666	1,159	1,635	1,142
Other provisions	372	667	422	649
	2,543	**3,034**	**2,688**	**2,866**

Provisions developed as follows:

T.41

Figures in millions of euros	At 1/1/2012	Changes in consolidated group	Amounts used	Amounts reversed	Increase incl. increase in discounted amount	Exchange adjustments	At 12/31/2012
Tax provisions	867	1	–236	–40	264	–22	834
Provisions in the personnel area	1,589	4	–409	–50	470	–5	1,599
Provisions in the sales and marketing area	2,777	150	–937	–373	1,229	–21	2,825
Other provisions	1,071	–5	–200	–102	296	–21	1,039
	6,304	**150**	**–1,782**	**–565**	**2,259**	**–69**	**6,297**

Of the total increase in provisions, an amount of EUR 63 million (previous year: EUR 60 million) relates to increases in 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. The effects of the amended IAS 19 on provisions for early phased retirement, in particular the treatment of step-up amounts, cannot currently be assessed for the fiscal year 2013. This is because the form in which the amended regulation is to be implemented has not yet been finalized, since the ASCG application guidance was not published until December 2012. 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.42

Figures in millions of euros	2012	2011
Contingent liabilities related to notes issued and transferred	19	17
Contingent liabilities from guarantees	14	23
Contingent liabilities from warranties	1	3
Other contingent liabilities	5	7
	39	**50**

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 838 million (previous year: EUR 755 million).

The obligations are due as follows:

T.43

Figures in millions of euros	2012	2011
Due not later than one year	228	220
Due later than one year and not later than five years	484	416
Due later than five years	126	119
	838	**755**

The payments of the period recognized in profit or loss of EUR 251 million (previous year: EUR 239 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 Bosch Pension Scheme has been in place for most Bosch Group associates in Germany since January 1, 2006. During the vesting phase, both company and employee contributions are made to the Bosch Pensionsfonds (Bosch pension fund) up to the tax-allowed limit for contributions; amounts in excess of this, as well as the claims of associates born before 1951, are reported in the unfunded obligation (direct benefit obligation).

Pension provisions for the defined benefit plans are calculated according to the projected unit credit method in accordance with IAS 19. This involves measuring future obligations using actuarial procedures, with prudent estimates of the relevant factors.

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

T.44

Percentage figures	Europe		Americas		Asia		Africa/ Australia		Total	
	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011
Discount factor	3.6	4.9	4.0	4.5	2.4	1.3	8.0	9.3	3.6	4.8
Expected return on plan assets	3.2	4.4	4.2	6.4	2.6	1.9	n.a.	n.a.	3.4	4.8
Future salary increases	2.9	2.9	4.2	4.2	3.7	2.3	n.a.	7.0	3.1	3.1
Pension increases	1.6	1.4	2.4	0.0	n.a.	n.a.	n.a.	6.0	1.6	1.2
Cost increase rate for medical plans	n.a.	n.a.	5.0	5.0	n.a.	n.a.	n.a.	8.3	5.0	5.1

n.a. not applicable

The discount factor in the euro zone was determined taking bonds into account which were rated AA at least once during the reporting period.

The assumptions about the expected return on assets are based on a target portfolio structure and the forecast returns in the individual investment categories. These forecasts are based on publicly available and internal capital market studies and forecasts for each category of asset. The estimates of future salary increases are made, among other things, on the basis of the economic situation and inflation.

Adjustments between the actuarial projected benefit obligation – after deducting plan assets – and the provision mainly result from actuarial gains or losses related to changes in the rates of personnel turnover and deviations between the actual salary development and the assumptions used for calculation purposes.

To make the reporting more transparent, the actuarial gains and losses from defined benefit plans are recognized outside of profit or loss in other comprehensive income. In this way, all actuarial gains and losses are accounted for.

If the benefit system is funded externally, the value of the assets of the external pension institutions is deducted from the benefit obligation resulting from the projected unit credit method. The externally funded pension institutions in Germany are Bosch Pensionsfonds AG and Bosch Hilfe e.V.

Pension schemes and obligations are measured at regular intervals, at least every three years. All significant schemes are measured annually by means of comprehensive actuarial procedures.

The first-time application of the amended IAS 19 is expected to raise the annual costs for the fiscal year 2013 due to applying the discount factors to the net obligation of EUR 65 million. From 2013, past service cost has to be recognized in full through profit or loss in the reporting period. This is not, however, expected to have any significant effects on the consolidated financial statements of the Bosch Group.

The present value of the obligation breaks down as follows:

T.45

Figures in millions of euros	2012	2011
Defined benefit obligation at January 1	**10,702**	**10,115**
Changes in consolidated group	12	5
Current service cost including contributions by the employees	408	396
Interest cost	498	483
Transfers	–11	–7
Past service cost	23	8
Pension payments	–547	–531
Actuarial losses	1,865	151
Currency translation	–61	94
Other	–6	–12
Defined benefit obligation at December 31	**12,883**	**10,702**

Plan assets developed as follows:

T.46

Figures in millions of euros	2012	2011
Fair value of plan assets at January 1	**3,855**	**3,622**
Changes in consolidated group	–3	3
Expected return on plan assets	192	201
Contributions paid	326	327
Contributions by the employees	15	14
Transfers	–1	–1
Benefits paid	–178	–164
Actuarial gains/losses	212	–203
Currency translation	–43	64
Other	–7	–8
Fair value of plan assets at December 31	**4,368**	**3,855**
Actual income/expense	404	–2
Estimated contributions in subsequent year	388	301

The fund assets comprise the following components:

T.47

Percentage figures	2012	2011
Shares	34.3	33.6
Fixed-interest securities	43.7	43.9
Property	10.8	11.7
Other	11.2	10.8

The funding status of the defined benefit obligations pursuant to IAS 19 is as follows:

T.48

Figures in millions of euros	2012	2011
Present value of benefit obligations from wholly unfunded plans	3,723	3,175
Present value of benefit obligations from plans that are wholly or partly funded	9,160	7,527
Total present value of benefit obligation	**12,883**	**10,702**
Plan assets at fair value	–4,368	–3,855
Net obligation	**8,515**	**6,847**
Past service cost	9	5
Asset amount not recognized as of December 31 due to the limitation pursuant to IAS 19.58 (b)	10	9
	8,534	**6,861**

The table below presents changes in the pension provisions:

T.49

Figures in millions of euros	2012	2011
Carrying amount at January 1	**6,861**	**6,503**
Changes in consolidated group	15	2
Net expense for the period	727	666
Transfers	–10	–6
Pension payments	–369	–367
Contributions paid	–326	–327
Actuarial losses	1,635	358
Other	1	32
Carrying amount at December 31	**8,534**	**6,861**

The total amount of recognized actuarial gains and losses developed as follows:

T.50

Figures in millions of euros	2012	2011
Total actuarial losses at January 1	**547**	**176**
Total actuarial losses	1,653	354
Change of effect pursuant to IAS 19.58 (b)	1	4
Other changes and adjustments	–19	
Total actuarial losses	**1,635**	**358**
Currency effects and changes in consolidated group		13
Total actuarial losses at December 31	**2,182**	**547**

The amounts recognized in the income statement are as follows:

T.51

Figures in millions of euros	2012	2011
Current service cost	393	382
Interest cost	498	483
Expected return on plan assets	–192	–201
Past service cost	26	7
Other	2	–5
Net expense for the period	**727**	**666**

The net expense is contained in the costs of the functional areas.

Expenses for defined contribution plans amounted to EUR 922 million (previous year: EUR 883 million).

Other disclosures in the notes:

T.52

Figures in millions of euros	2012	2011
Distribution of losses from the valuation	1,865	151
of which from changes in assumptions	1,770	259
of which from unexpected changes in number of beneficiaries	95	–108
Payments expected in the following year		
additions to plan assets	388	301
directly payable benefits	352	352

T.53

Figures in millions of euros	2012	2011	2010	2009	2008
History of the present value of the obligation	12,883	10,702	10,115	8,728	8,488
History of the plan assets	4,368	3,855	3,622	2,957	2,755
History of net obligation	8,515	6,847	6,493	5,771	5,733
History of change in obligation due to changes in number of beneficiaries	95	–108	148	–4	–24
History of change in plan assets (actual vs. expected)	212	–203	94	159	–580

Effect of change in cost trend on medical costs

T.54

Figures in millions of euros	2012	2011	One percentage point increase in cost trend		One percentage point decrease in cost trend	
			2012	2011	2012	2011
Present value of the obligation	215	212	236	231	196	195
Service cost and interest cost	12	12	13	14	11	12

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 Bosch Automotive Diesel Systems Co., Ltd., Wuxi, China, and in Bosch Ltd., Bangalore, India.

The changes were mainly caused by the acquisition of the remaining shares in Bosch Emission Systems GmbH & Co. KG, Stuttgart, Germany.

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 business entities, 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 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 3,587 million (previous year: EUR 3,328 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

T.56

Figures in millions of euros	Automotive Technology		Industrial Technology	
	2012	2011	2012	2011
External sales	31,047	30,404	8,017	8,038
Intersegment sales	131	98	235	252
Total sales	31,178	30,502	8,252	8,290
EBIT	1,410	2,331	–713	–364
Non-cash expenses (without depreciation)	1,897	1,888	410	361
Amortization and depreciation	1,834	1,801	445	376
Impairment losses on intangible assets and property, plant, and equipment	32	67	580	564
Non-cash income	501	710	112	136
Assets	9,274	9,505	3,398	3,753

Based on the internal management and reporting structure, the Bosch Group is divided into three 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 activities of the Automotive Technology business sector mainly comprise injection technology for internal-combustion engines, powertrain peripherals, alternative drive concepts, active and passive vehicle safety systems, assistance and comfort functions, technology for in-car information and communication, and a range of after-sales, engineering-support, and service concepts 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),
- Packaging technology (machines and packaging lines for the confectionery, food, beverage, and tobacco industry, as well as for the pharmaceuticals industry),
- Photovoltaics (solar cells and photovoltaic modules).

The operations of the Consumer Goods and Building Technology 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),
- 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),
- Household appliances (appliances for cooking, washing-up, washing, drying, cooling, freezing, floor care, etc.).

	Consumer Goods and Building Technology		All other segments		Consolidation		Group	
	2012	2011	2012	2011	2012	2011	2012	2011
	13,358	13,029	42	23			52,464	51,494
	27	27			–393	–377		
	13,385	13,056	42	23	–393	–377	52,464	51,494
	620	731	–7	11			1,310	2,709
	595	553	5	2			2,907	2,804
	439	431	8	8			2,726	2,616
	17	7					629	638
	122	173					735	1,019
	5,085	4,958	9	2			17,766	18,218

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.

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.57

Figures in millions of euros	2012	2011
Sales		
Sales by reportable segment	52,815	51,848
All other segments	42	23
Consolidation	–393	–377
Group sales	**52,464**	**51,494**
EBIT		
EBIT by reportable segment	1,317	2,698
All other segments	–7	11
Financial income	2,924	1,573
Financial expenses	–1,438	–1,654
Profit before tax	**2,796**	**2,628**
Assets		
Assets by reportable segment	17,757	18,216
All other segments	9	2
Impairment losses on segment assets	–1,429	–1,403
Other current assets	6,824	6,154
Non-current assets	33,165	31,647
Group assets	**56,326**	**54,616**

Disclosures by important country

T.58

Figures in millions of euros	Sales by registered office of the customer		Non-current assets[1)]	
	2012	2011	2012	2011
Europe	**29,780**	**30,357**	**13,922**	**14,041**
of which Germany	12,115	12,008	8,683	9,036
of which France	2,700	2,965	308	326
of which the U.K.	2,385	2,219	115	112
of which Italy	1,891	2,101	472	494
Americas	**10,057**	**9,181**	**2,997**	**2,011**
of which the U.S.	6,887	5,888	2,459	1,411
Asia	**11,684**	**11,087**	**3,401**	**3,282**
of which China	5,149	4,694	1,813	1,656
of which Japan	2,464	2,285	666	765
Other regions	**943**	**869**	**49**	**96**
Group	**52,464**	**51,494**	**20,369**	**19,430**

[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 notes 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.59

Figures in millions of euros	2012	2011
Loans and receivables	–71	71
Held-to-maturity investments	1	1
Available-for-sale financial assets	1,678	330
Assets and liabilities held for trading	143	–273
Financial liabilities measured at amortized cost	–120	–328

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.

Carrying amounts and fair values by category

T.60

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	3,587	3,587				3,587
Current investments		760					
Available-for-sale financial assets	AfS	760		760			760
Trade receivables	LaR	9,169	9,169				9,169
Other current assets		2,153					
Receivables from finance leases	n.a.	28				28	28
Other financial assets	LaR	944	944				944
Derivative financial assets	FAHfT	56			56		56
Non-financial assets within the meaning of IFRS 7	n.a.	1,125					
Non-current financial assets		9,818					
Available-for-sale financial assets	AfS	7,999		7,999			7,999
Held-to-maturity investments	HtM	7	7				7
Investments	AfS	1,164	719	445			445
Derivative financial assets	FAHfT	72			72		72
Receivables from finance leases	n.a.	139				139	139
Derivative financial assets	LaR	303	303				304
Non-financial assets within the meaning of IFRS 7	n.a.	134					
Equity and liabilities							
Trade payables	FLAC	4,034	4,034				4,034
Current financial liabilities		1,364					
Bonds	FLAC	700	700				700
Liabilities to banks	FLAC	661	661				661
Other financial liabilities	FLAC	3	3				3
Other current liabilities		4,469					
Derivative financial liabilities	FLHfT	49			49		49
Finance lease obligations	n.a.	8				8	8
Other financial liabilities	FLAC	775	775				775
Other non-financial liabilities within the meaning of IFRS 7	n.a.	3,637					
Non-current financial liabilities		3,297					
Bonds	FLAC	1,946	1,946				2,231
Promissory loans	FLAC	575	575				629
Liabilities to banks	FLAC	760	760				813
Other financial liabilities	FLAC	16	16				17
Other non-current liabilities		279					
Derivative financial liabilities	FLHfT	27			27		27
Finance lease obligations	n.a.	16				16	16
Other financial liabilities	FLAC	125	125				130
Other non-financial liabilities within the meaning of IFRS 7	n.a.	111					

LaR Loans and receivables
AfS Available-for-sale financial assets
HtM Held-to-maturity investments
FAHfT Financial assets held for trading

Figures in millions of euros	Category pursuant to IAS 39	Carrying amount 2011	Carrying amount pursuant to IAS 39			Carrying amount pursuant to IAS 17	Fair value 2011
			(Amortized) cost	Fair value recognized in other comprehensive income	Fair value recognized in profit or loss		
Assets							
Cash and cash equivalents	LaR	3,328	3,328				3,328
Current investments		718					
Available-for-sale financial assets	AfS	718		718			718
Trade receivables	LaR	9,156	9,156				9,156
Other current assets		1,816					
Receivables from finance leases	n.a.	28				28	28
Other financial assets	LaR	744	744				744
Derivative financial assets	FAHfT	56			56		56
Non-financial assets within the meaning of IFRS 7	n.a.	988					
Non-current financial assets		9,942					
Available-for-sale financial assets	AfS	7,583		7,583			7,583
Held-to-maturity investments	HtM	7	7				7
Investments	AfS	1,845	728	1,117			1,117
Derivative financial assets	FAHfT	55			55		55
Receivables from finance leases	n.a.	140				140	140
Other financial assets	LaR	170	170				177
Non-financial assets within the meaning of IFRS 7	n.a.	142					
Equity and liabilities							
Trade payables	FLAC	4,241	4,241				4,241
Current financial liabilities		437					
Liabilities to banks	FLAC	383	383				383
Other financial liabilities	FLAC	54	54				54
Other current liabilities		4,566					
Derivative financial liabilities	FLHfT	205			205		205
Finance lease obligations	n.a.	10				10	10
Other financial liabilities	FLAC	670	670				670
Other non-financial liabilities within the meaning of IFRS 7	n.a.	3,681					
Non-current financial liabilities		3,851					
Bonds	FLAC	2,472	2,472				2,735
Promissory loans	FLAC	499	499				544
Liabilities to banks	FLAC	858	858				930
Other financial liabilities	FLAC	22	22				24
Other non-current liabilities		453					
Derivative financial liabilities	FLHfT	100			100		100
Finance lease obligations	n.a.	20				20	20
Other financial liabilities	FLAC	162	162				175
Other non-financial liabilities within the meaning of IFRS 7	n.a.	171					

FLAC Financial liabilities measured at amortized cost
FLHfT Financial liabilities held for trading
n.a. not applicable

The carrying amounts of the financial assets and liabilities, classified by the categories defined in IAS 39, are as follows:

T.61

Figures in millions of euros	2012	2011
Loans and receivables	14,003	13,398
Held-to-maturity investments	7	7
Available-for-sale financial assets	9,923	10,146
Financial assets held for trading	128	111
Financial liabilities measured at amortized cost	9,595	9,361
Financial liabilities held for trading	76	305

Composition of the derivative financial instruments

T.62

Figures in millions of euros	Market values				Nominal values	
	2012 up to 1 year	2012 more than 1 year	2011 up to 1 year	2011 more than 1 year	2012	2011
Derivatives with a positive market value						
Interest derivatives	**0**	**2**	**0**	**3**	**543**	**762**
of which interest swaps		2	0		530	3
of which other interest derivatives	0			3	13	759
Foreign currency derivatives	**49**	**4**	**50**	**1**	**1,900**	**588**
Other derivatives	**7**	**66**	**6**	**51**	**166**	**82**
Derivatives with a negative market value						
Interest derivatives	**0**	**8**	**0**	**9**	**248**	**266**
of which interest swaps		8		9	228	228
of which other interest derivatives	0		0		20	38
Foreign currency derivatives	**43**	**2**	**189**	**64**	**1,925**	**4,108**
Other derivatives	**6**	**17**	**16**	**27**	**164**	**231**

The foreign currency derivatives are mainly forward exchange contracts.

The fair values of financial assets and financial liabilities were derived as follows:

T.63

Figures in millions of euros	Prices listed on active markets		Other significant observable input parameters		Total	
	2012	2011	2012	2011	2012	2011
Financial assets						
Investments	425	1,103	20	14	445	1,117
Derivative financial instruments	20	9	108	102	128	111
Other securities	3,389	4,108	5,370	4,193	8,759	8,301
Financial liabilities						
Derivative financial instruments	20	38	56	267	76	305

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 central controlling parameter of our financial target system is value contribution, which represents cash flow less cost of capital. Its development is the yardstick we use to assess performance, and it is also used for portfolio management. It is supplemented for capital management purposes by the conventional financial, liquidity, and indebtedness indicators.

Hedging policy and financial derivatives

The 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.

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 CNY.

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 EUR 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.64

Figures in millions of euros	10% increase in EUR		10% decrease in EUR	
	2012	2011	2012	2011
CHF	14	91	–11	–91
CNY	–30	–22	27	14
CZK	–28	–41	30	46
GBP	–8	10	7	–10
HUF	–16	–21	19	24
JPY	6	56	–9	–71
PLN	–10	–12	10	12
RUB	–4	–22	3	22
USD	–260	–182	251	170

A change in the USD of 10 percent (starting from the closing rate) against the currency listed in the table would have the following implications for the profit before tax:

T.65

Figures in millions of euros	10% increase in USD		10% decrease in USD	
	2012	2011	2012	2011
CNY	–49	–37	49	37

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 means 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. Due to immateriality, 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.66

Figures in millions of euros	Increase in market interest level by 100 basis points		Decrease in market interest level by 100 basis points	
	2012	2011	2012	2011
Reserve from securities	–190	–154	190	154
Profit before tax	29	26	–29	–26

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 carrying amount of EUR 2,563 million (previous year: EUR 2,945 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.67

Figures in millions of euros	10 % increase in share price		10 % decrease in share price	
	2012	2011	2012	2011
Reserve from securities	258	297	–246	–282
Profit before tax	3	0	–15	–15

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.68

Figures in millions of euros	10% increase in forward rates		10% decrease in forward rates	
	2012	2011	2012	2011
Profit before tax	20	17	–20	–17

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

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

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 sections on trade receivables and non-current financial assets contain further information about credit risks.

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 4,347 million (previous year: EUR 4,046 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 3,000 million, of which EUR 2,450 million has been drawn. See the section on current and non-current financial liabilities for more information about liquidity risks.

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

Sales, receivables, and liabilities due from and to related parties

T.69

Figures in millions of euros	Sales		Receivables		Liabilities	
	2012	2011	2012	2011	2012	2011
FMP Group (Australia) Pty. Ltd., Australia		4		1		1
avim solar production Co. Ltd., China	26	12		3		
Weifu High Technology Co., Ltd., China	4	8		2	5	5
EM-motive GmbH, Germany	13		8	1	3	
Knorr-Bremse Systeme für Nutzfahrzeuge GmbH, Germany	47	48	7	9		
Oleodinamica Gambini S.r.l., Italy	2	2	1	1		
MHB Filter India Private Ltd., India					11	
Johnson Controls Autobatterie GmbH & Co. KGaA, Germany	5	4	1			
Akebono Brake Industry Co., Ltd., Japan		2			2	6
Knorr-Bremse Commercial Vehicle Systems Japan Ltd., Japan		1			1	1
Doowon Precision Industry Co., Ltd., Korea	3	3	1	1		
Loos Centrum Sp.z o.o., Poland	2	10	1	2		
Rotzinger AG, Switzerland			2	2	1	2
Associated Fuel Pump Systems Corporation, USA	2	1	1	1		
North America Fuel Systems Remanufacturing LLC, USA	7	3	1	1		

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 2012 (previous year: EUR 36 million) and breaks down as follows:

T.70

Figures in millions of euros	2012	2011
Short-term benefits	18	20
Post-employment benefits	11	14
Other long-term benefits	1	2

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 0.3 million (previous year: EUR 0.2 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, 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 board
The total remuneration of the members of the board of management (including provisions) comes to EUR 15 million in the fiscal year (previous year: EUR 18 million), and that of the former members of the board of management and their dependants to EUR 22 million (previous year: EUR 10 million). The remuneration of the members of the supervisory board comes to approximately EUR 2 million. An amount of EUR 123 million (previous year: EUR 90 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 the total remuneration paid to former members of the management and their dependants and the pension obligations to formers members of management and their dependent survivors is largely due to the retirement of members of management in the past fiscal year.

Headcount

T.71

	Annual average 2012		Annual average 2011	
	Total	thereof companies included proportionally	Total	thereof companies included proportionally
EU countries	179,363	17,478	176,851	17,139
Rest of Europe	17,107	3,403	16,097	3,084
Americas	34,595	2,364	34,347	2,087
Asia, Africa, Australia	75,207	9,936	67,961	9,660
	306,272	**33,181**	**295,256**	**31,970**

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

T.72

Figures in millions of euros	2012	2011
Fees for		
Audit services	4.0	4.1
Audit-related services	0.1	0.1
Tax advisory services	1.5	1.1
Other services	3.2	2.4

List of shareholdings of the Bosch Group as of December 31, 2012

1 Consolidated group

T.73

	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 Ammann GmbH	Königsbrunn	100.0
	Beissbarth GmbH	Munich	100.0 [1), 2)]
	Bosch Access Systems GmbH	Würselen	100.0
	Bosch Communication Center Magdeburg GmbH	Magdeburg	100.0
	Bosch Emission Systems GmbH & Co. KG	Stuttgart	100.0 [3)]
	Bosch Engineering GmbH	Abstatt	100.0 [1), 2)]
	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 Filtration Systems GmbH	Ketsch	100.0 [1)]
	Bosch Rexroth Pneumatics GmbH	Laatzen	100.0 [1)]
	Bosch Sensortec GmbH	Kusterdingen	100.0 [1)]
	Bosch Sicherheitssysteme Engineering GmbH	Nuremberg	100.0
	Bosch Sicherheitssysteme GmbH	Stuttgart	100.0 [2)]
	Bosch Sicherheitssysteme Montage und Service GmbH	Weimar	100.0
	Bosch Software Innovations GmbH	Immenstaad	100.0 [1)]
	Bosch Solar CISTech GmbH	Brandenburg/ Havel	98.7 [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)]
	BSH Bosch und Siemens Hausgeräte GmbH	Munich	50.0 [4)]
	Buderus Guss GmbH	Wetzlar	100.0 [1)]
	Buderus Immobilien GmbH	Wetzlar	96.0 [1)]
	Eisai Machinery GmbH	Cologne	100.0
	Elektra-Versicherungsvermittlungs-GmbH	Frankfurt	100.0 [1)]
	ETAS GmbH	Stuttgart	100.0 [1), 2)]
	EVI Audio GmbH	Straubing	100.0
	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
	Bosch KWK Systeme GmbH	Lollar	100.0 [1)]
	Landau Electronic GmbH	Mörfelden-Walldorf	100.0

	Company name	Registered office	Percentage share of capital held
	Bosch Industriekessel GmbH	Gunzenhausen	100.0 [1]
	Matra-Werke GmbH	Hainburg	100.0
	Moehwald GmbH	Homburg/Saar	100.0 [1]
	Pharmatec GmbH	Dresden	100.0 [1]
	Robert Bosch Battery Systems GmbH	Stuttgart	100.0
	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]
	SPX Service Solutions Germany GmbH	Hainburg	100.0
	UC Vermögensverwaltung GmbH	Stuttgart	100.0 [1]
	ZF Lenksysteme GmbH	Schwäbisch Gmünd	50.0 [4]

[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] These companies make use of the exemption provided for in Sec. 264b HGB.
[4] These consolidated financial statements were included proportionately in accordance with IAS 27.

	Company name	Registered office	Percentage share of capital held
Europe			
Austria	Bosch Rexroth GmbH	Pasching	100.0
	Bosch Rexroth Pneumatics GmbH	Pasching	100.0
	Bosch Industriekessel Austria GmbH	Bischofshofen	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
	Servico N.V.	Aartselaar	100.0
	sia Abrasives Belgium N.V. / S.A.	Mollem	100.0
Czech Republic	Bosch Diesel s.r.o.	Jihlava	100.0
	Bosch Rexroth spol. s.r.o.	Brno	100.0
	Bosch Rexroth Pneumatics 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 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 Rexroth (France) S.A.S.	Vénissieux	100.0
	Bosch Security Systems S.A.S. France	Clamart	100.0
	E.L.M. Leblanc S.A.S.U.	Drancy	100.0
	Bosch Thermotechnologie S.A.S.	Saint Thégonnec	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
	SPX Service Solutions France S.a.r.l.	La Ferté-Bernard	100.0

	Company name	Registered office	Percentage share of capital held
Greece	Robert Bosch S.A.	Peristeri (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 Szerszámgyártó 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 Rexroth Oil Control S.p.A.	Milan	94.5
	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 (Reggio Emilia)	100.0
	SPX Italia S.r.l.	Parma	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	99.8
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.	Appeldoorn	100.0
	Bosch Thermotechnik Holding B.V.	Deventer	100.0
	Bosch Transmission Technology B.V.	Tilburg	100.0

	Company name	Registered office	Percentage share of capital held
	Nefit B.V.	Deventer	100.0
	Nefit Vastgoed B.V.	Deventer	100.0
	Robert Bosch B.V.	Amsterdam	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
	Robert Bosch A/S	Ski	100.0
Poland	Bosch Rexroth Sp. z o.o.	Pruszków	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.	Aveiro	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.	Bucharest	100.0
	ROBERT BOSCH S.R.L.	Bucharest	100.0
Russian Federation	OOO Bosch Rexroth	Moscow	100.0
	OOO Bosch Power Tools	Engels	100.0
	OOO Bosch Thermotechnik	Moscow	100.0
	OOO "Construction & investments"	Khimki	100.0
	OOO Robert Bosch	Moscow	100.0
	Robert Bosch Saratow AG	Engels	100.0
Slovakia	Holger Christiansen Produktion Slovakia s.r.o.	Bernolákovo	100.0
Slovenia	Indramat electromotorji d.o.o.	Zelezniki	100.0
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

	Company name	Registered office	Percentage share of capital held
	BOSCH SISTEMAS DE FRENADO, S.L.	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.	Madrid	100.0
	ROBERT BOSCH ESPAÑA, S.L.U.	Madrid	100.0
	sia Abrasives Espana S.A.U.	Madrid	100.0
Sweden	Bosch Rexroth Teknik AB	Stockholm	100.0
	Bosch Rexroth Pneumatics AB	Älvsjö	100.0
	Bosch Thermoteknik AB	Tranås	100.0
	Bosch Rexroth Mellansel AB	Mellansel	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 Rexroth Schweiz AG	Buttikon	100.0
	Bosch Rexroth Pneumatics 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.	Bursa	100.0
	Bosch Sanayi ve Ticaret A.S.	Bursa	100.0
	Bosch Termoteknik Isitma ve Klima Ticaret A.S.	Istanbul	100.0
	Bosch Termoteknik Sanayi ve Ticaret A.S.	Manisa	100.0
Ukraine	Holger Christiansen Production Ukraine	Krakovets	100.0
United Kingdom	Bosch Lawn and Garden Ltd.	Stowmarket	100.0
	Bosch Packaging Technology Limited	Derby	100.0
	Bosch Rexroth Ltd.	St. Neots	100.0
	Bosch Rexroth Pneumatics Ltd.	Cirencester	100.0
	Bosch Rexroth UK Holdings Ltd.	St. Neots	100.0
	Bosch Security Systems Ltd.	Denham	100.0
	Bosch Thermotechnology Ltd.	Worcester	100.0
	Derwent Systems Ltd.	Cramlington	100.0

	Company name	Registered office	Percentage share of capital held
	Extreme CCTV (UK) Ltd.	Cramlington	100.0
	Forward Vision CCTV Ltd.	Church Crockham	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
	SPX United Kingdom Limited	Brixworth	100.0
	Telex Communications (UK) Ltd.	Mitcham	100.0
	Valley Forge (UK) Limited	Basildon	100.0
	Worcester Group plc	Warndon, Worcester	100.0
	Worcester Group Properties Ltd.	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 Ltda.	Campinas	100.0
	Robert Bosch Centro de Comunicacao Limitada	Campinas	100.0
	Robert Bosch Tecnologia de Embalagem Ltda.	Alphaville	100.0
	sia Abrasivos Industriais Ltda.	São José dos Pinhais	100.0
	Service Solutions Brasil Desenvolvimento de Technologia Ltda.	São Paulo	100.0
Canada	Bosch Rexroth Canada Corporation	Welland, ON	100.0
	Bosch Rexroth Pneumatics Inc.	Welland, ON	100.0
	Extreme CCTV Inc.	Burnaby, BC	100.0
	Freud Canada Inc.	Mississauga, ON	100.0
	ROBERT BOSCH INC.	Mississauga, ON	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 México S.A. de C.V.	Mexico City	100.0
	Robert Bosch Mexico Holding, S.A. de C.V.	Mexico City	100.0

	Company name	Registered office	Percentage share of capital held
	Robert Bosch Sistemas Automotrices, S.A. de C.V.	Juarez	100.0
	Robert Bosch México Sistemas Automotrices, S.A. de C.V.	San Luis Potosí	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 Brake Components LLC	Broadview, IL	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 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, LLC	San Mateo, CA	100.0
	BSE PV Maui County II, LLC	San Mateo, CA	100.0
	Compu-Spread Corporation	Delano, MN	100.0
	Eisai Machinery U.S.A. Inc.	Allendale, NJ	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
	Holger Christiansen North America Inc.	Suwanee, GA	100.0
	Robert Bosch Healthcare Systems, Inc.	Farmington Hills, MI	100.0
	Purolator Filters North America LLC	Fayetteville, NC	50.0[5)]
	Robert Bosch Battery Systems LLC	Orion, MI	100.0
	Robert Bosch Finance LLC	Broadview, IL	100.0
	ROBERT BOSCH FUEL SYSTEMS LLC	Kentwood, MI	100.0
	Robert Bosch LLC	Broadview, IL	100.0
	Robert Bosch North America Corporation	Broadview, IL	100.0
	Robert Bosch Packaging Technology Inc.	Minneapolis, MN	100.0
	Robert Bosch Tool Corporation	Mt. Prospect, IL	100.0
	Service Solutions US LLC	Warren, MI	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 (China) Investment Ltd.	Shanghai	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 (Suzhou) Co., Ltd.	Suzhou	100.0
	Bosch Gardening Equipment (Ningbo) Co. Ltd.	Yuyao City	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 Security Systems Ltd.	Hong Kong	100.0
	Bosch Thermotechnology (Beijing) Co., Ltd.	Beijing	100.0
	Bosch Trading (Shanghai) Co., Ltd.	Shanghai	100.0
	Eisai Machinery 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
	SPX Transportation and Industrial Solutions (Suzhou) Co., Ltd.	Suzhou	100.0
	Taixiang Vehicle Replace Parts (Shenzhen) Co., Ltd.	Shenzhen	100.0
	United Automotive Electronic Systems Co., Ltd.	Shanghai	51.0 [5)]
India	Bosch Automotive Electronics India Private Ltd.	Bangalore	100.0
	Bosch Chassis Systems India Ltd.	Pune	97.9
	Bosch Ltd.	Bangalore	71.2
	Bosch Rexroth (India) Ltd.	Ahmedabad	96.4
	Robert Bosch Engineering and Business Solutions Ltd.	Bangalore	100.0
Japan	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
	Eisai Machinery Co., Ltd.	Tokyo	100.0
	ETAS K.K.	Yokohama	100.0
	EVI Audio (Japan) Ltd.	Tokyo	100.0
	FA Niigata Co., Ltd.	Niigata	100.0
	Foundation Brakes Japan Corporation	Tokyo	100.0

	Company name	Registered office	Percentage share of capital held
	Fuji Aitac Co., Ltd.	Gunma	100.0
	Gunma Seiki Co., Ltd.	Gunma	100.0
	Nippon Injector Corporation	Odawara	50.0
	SPX Service Solutions Japan Limited	Tokyo	100.0
Korea	Bosch Electrical Drives Co., Ltd.	Buyong	100.0
	Bosch Rexroth 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 Solar Energy Malaysia Sdn. Bhd.	Penang	100.0
	Bosch Rexroth Sdn. Bhd.	Shah Alam	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	Robert Bosch Security Solutions Pte.	Singapore	100.0
	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
Taiwan	Bosch Rexroth Co. Ltd.	Taipei	100.0
	Robert Bosch Taiwan Co., Ltd.	Taipei	100.0
	Unipoint Electric MFG Co., Ltd.	Taipei	98.4
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
Rest of the 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 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
	SPX Australia Pty. Ltd.	Melbourne	100.0

	Company name	Registered office	Percentage share of capital held
New Zealand	AIA Abrasives Ltd.	Christchurch	100.0
	Bosch Security Systems Ltd.	Auckland	100.0
	Robert Bosch Ltd.	Auckland	100.0
South Africa	Robert Bosch (Pty.) Ltd.	Brits	100.0

[5] The financial statements were included proportionately in accordance with IAS 27.

2 Preconsolidated companies (proportionate consolidation) in the financial statements of the subgroups included proportionately

	Company name	Registered office
Germany	BSH Bosch und Siemens Hausgeräte GmbH	Munich
	BSH Hausgeräte Service GmbH	Munich
	BSH Hausgeräte Service Nauen GmbH	Nauen
	BSH Hausgeräte Vertriebs GmbH	Munich
	BSH Hausgerätewerk Nauen GmbH	Nauen
	BSH Vermögensverwaltungs-GmbH	Munich
	CONSTRUCTA GmbH	Munich
	Constructa-Neff Vertriebs-GmbH	Munich
	Gaggenau Hausgeräte GmbH	Munich
	Neff GmbH	Munich
	Robert Bosch Hausgeräte GmbH	Munich
	Siemens-Electrogeräte GmbH	Munich
	ZF Lenksysteme GmbH	Schwäbisch Gmünd
	ZF Lenksysteme Nacam GmbH	Bremen
Europe		
Austria	BSH Hausgeräte Gesellschaft mbH	Vienna
	BSH Finance and Holding GmbH	Vienna
Belgium	BSH Home Appliances S.A.	Brussels
Bulgaria	BSH Domakinski Uredi Bulgaria EOOD	Sofia
Croatia	BSH kucanski uredaji d.o.o. za usluge	Zagreb
Czech Republic	BSH domácí spotřebiče s.r.o.	Prague
Denmark	BSH Hvidevarer A/S	Ballerup
Finland	BSH Kodinkoneet Oy	Helsinki

	Company name	Registered office
France	BSH Electroménager S.A.S.	St. Ouen
	Gaggenau Industrie S.A.S.	Lipsheim
	ZF - Systèmes de Directions France S.A.S.	Marignier
	ZF Systèmes de Direction Nacam S.A.S.	Vendôme
Greece	BSH Ikiakes Syskeves A.B.E.	Athens
Hungary	BSH Háztartási Készülék Kereskedelmi Kft.	Budapest
	ZF Lenksysteme Hungaria Kft.	Eger
Italy	BSH Elettrodomestici S.p.A.	Milan
Luxembourg	BSH électroménagers S.A.	Luxembourg
Netherlands	BSH Huishoudapparaten B.V.	Amsterdam
Norway	BSH Husholdningsapparater A/S	Oslo
Poland	BSH Sprzet Gospodarstwa Domowego Sp. z o.o.	Warsaw
Portugal	BSHP Electrodomésticos, S.U., Lda.	Lisbon
Romania	BSH Electrocasnice S.R.L.	Bucharest
Russian Federation	OOO BSH Bytovye Pribory	St. Petersburg
	OOO BSH Bytowaja Technika	Moscow
Serbia	BSH KUCNI Aparati d.o.o. Beograd	Belgrade
Slovakia	BSH Drives and Pumps s.r.o.	Michalovce
Slovenia	BSH Hišni Aparati d.o.o.	Nazarje
Spain	BSH Electrodomésticos España, S.A.	Huarte
Sweden	BSH Home Appliances AB	Stockholm
Switzerland	BSH Hausgeräte AG	Geroldswil
Turkey	BSH Ev Aletleri Sanayi ve Ticaret A.S.	Istanbul
Ukraine	TOV BSH Pobutova Technika	Kiev
United Kingdom	BSH Home Appliances Limited	Milton Keynes

	Company name	Registered office
Americas		
Argentina	BSH Electrodomésticos S.A.	Buenos Aires
Brazil	BSH Participações Ltda.	São Paulo
	ZF Sistemas de Direcáo Ltda.	Sorocaba
Canada	BSH Home Appliances Ltd./Électroménagers BSH Ltée	Mississauga, ON
Peru	BSH Electrodomésticos S.A.C.	Callao-Lima
United States	BSH Home Appliances Corporation	Huntington Beach, CA
	ZF Steering Systems LLC	Florence, KY
Uruguay	Briky S.A.	Montevideo
Asia		
China	BSH Electrical Appliances (Anhui) Co., Ltd.	Chuzhou
	BSH Electrical Appliances (Jiangsu) Co., Ltd.	Nanjing
	BSH Home Appliances (China) Co., Ltd.	Nanjing
	BSH Home Appliances Co., Ltd.	Chuzhou
	BSH Home Appliances Holding (China) Co., Ltd.	Nanjing
	BSH Home Appliances Ltd.	Hongkong
	BSH Home Appliances Service Jiangsu Co., Ltd.	Nanjing
	BSW Household Appliances Co., Ltd.	Wuxi
	ZF Commercial Vehicle Steering (Shandong) Co., Ltd.	Jinan
	ZF Lenksysteme (Shanghai) Co., Ltd.	Shanghai
	ZF Shanghai Steering Systems Co., Ltd.	Shanghai
	ZF Shanghai Steering System (Yantai) Co., Ltd.	Yantai
	ZF Steering Jincheng (Nanjing) Co., Ltd.	Nanjing
India	BSH Home Appliances Private Limited	Mumbai
	BSH Household Appliances Manufacturing Private Limited	Mumbai
	ZF Lenksysteme India Private Ltd.	Pune
Indonesia	PT BSH Home Appliances	Jakarta
Israel	BSH Home Appliances Ltd.	Tel Aviv
Korea	BSH Home Appliances Limited	Yongin-City
Malaysia	BSH Home Appliances Sdn. Bhd.	Kuala Lumpur
	ZF Steerings (Malaysia) Sdn. Bhd.	Penang

	Company name	Registered office
Saudi Arabia	BSH Home Appliances Saudi Arabia LLC	Jeddah
Singapore	BSH Home Appliances Pte. Ltd.	Singapore
Taiwan	BSH Home Appliances Private Limited	Taipei
Thailand	BSH Home Appliances Ltd.	Bangkok
	BSH Home Appliances Manufacturing Ltd.	Kabinburi
United Arab Emirates	BSH Home Appliances FZE	Dubai
	BSH Home Appliances Trading LLC	Dubai
Rest of the world		
Australia	BSH Home Appliances Pty. Ltd.	Heatherton
Morocco	BSH Electroménagers (SA)	Casablanca
New Zealand	BSH Home Appliances Ltd.	Auckland
South Africa	BSH Home Appliances (Pty) Ltd.	Johannesburg

3 Investments measured at cost or at fair value

	Company name	Registered office	Percentage share of capital held
Germany	AIG Planungs- und Ingenieurgesellschaft mbH	Stuttgart	100.0
	Asanetwork GmbH	Willstätt	23.3
	Bosch Emission Systems Verwaltungs-GmbH	Stuttgart	100.0
	Bosch Energy and Building Solutions GmbH	Ditzingen	100.0
	Bosch Global Travel Management GmbH	Stuttgart	100.0
	Bosch Mahle Turbo Systems GmbH & Co. KG	Stuttgart	50.0
	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 Systems Engineering GmbH	Holzkirchen	100.0
	BS Systems GmbH & Co. KG	Zusmarshausen	50.0
	CDE - Packaging GmbH	Glauburg-Stockheim	49.0
	ECP Energiecontracting GmbH	Pfullendorf	81.0

	Company name	Registered office	Percentage share of capital held
	EM-motive GmbH	Hildesheim	50.0
	Energiecontracting Heidelberg AG	Heidelberg	100.0
	Escrypt GmbH	Bochum	100.0
	GFI Gesellschaft für Infrastrukturdienste mbH	Reutlingen	100.0
	Heliatek GmbH	Dresden	20.2
	Hubject GmbH	Berlin	16.7
	inubit AG	Berlin	100.0
	Knorr-Bremse Systeme für Nutzfahrzeuge GmbH	Munich	20.0
	Koller + Schwemmer GmbH	Nuremberg	100.0
	KomSolar Invest GmbH	Erfurt	51.0
	Makat Candy Technology GmbH	Dierdorf	100.0
	Mobility Media GmbH	Berlin	80.0
	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 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
	Johnson Controls Autobatterie GmbH & Co. KGaA	Hannover	20.0
	JCB Management GmbH	Hannover	20.0
Europe			
Austria	Bosch General Aviation Technology GmbH	Vienna	100.0
	sia Abrasives GmbH	Schwaz	100.0
Belarus	Robert Bosch OOO	Minsk	100.0
Belgium	EpiGaN NV	Leuven	22.0
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 Techniques d'Emballage S.A.S.	Hoenheim	100.0
	ETAS S.A.S.	Rungis	100.0

	Company name	Registered office	Percentage share of capital held
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 SRL	Lugo	100.0
	MA.NA. S.r.l.	Borgo San Giovanni	50.0
	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	Advanced Diesel Particulate Filters Sp. z o.o. w likwidacji	Wroclaw	100.0
	Loos Centrum Sp.z o.o.	Warsaw	26.0
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	SPX Iberica S.A.	Guadalajara	100.0
Switzerland	Bosch Pouch Systems AG	Beringen	100.0
	Pharmatec Schweiz GmbH	Pratteln	100.0
	Rotzinger AG	Kaiseraugst	46.7
	SPX Schweiz AG	Kriens	100.0
Ukraine	Robert Bosch Ltd.	Kiev	100.0

	Company name	Registered office	Percentage share of capital held
United Kingdom	aleo solar UK Ltd.	Denton Island, Newhaven	100.0
	Beissbarth UK Ltd.	Nottingham	100.0
	ETAS Ltd.	Osbaldwick York	100.0
	Freud Tooling UK Ltd.	Leeds	100.0
	Lagta Limited	Motherwell	100.0
	Lagta Group Training Limited	Motherwell	100.0
	Spore Holding Ltd.	Daventry	100.0
	LCX Solar Limited	Shepperton	33.3
	VL Churchill Ltd.	Daventry	100.0
Americas			
Brazil	Bosch Management Support Ltda.	Campinas	100.0
	Heliotek Maquinas e Equipamentos Ltda.	São Paulo	100.0
	Ishida do Brasil Ltda.	Osasco	50.0
	Metapar Usinagem Ltda.	Curitiba-Paraná	100.0
Chile	Robert Bosch S. A.	Santiago de Chile	100.0
Columbia	Robert Bosch Ltda.	Bogotá	100.0
Mexico	SPX de Mexico 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
United States	Akustica Inc.	Pittsburgh, PA	100.0
	Associated Fuel Pump Systems Corporation	Anderson, SC	50.0
	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 Pouch Systems LLC	Wilmington, DE	100.0
	Bosch Software Innovations Corp.	Chicago, IL	100.0
	Escrypt Inc.	Ann Arbor, MI	100.0
	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
	RTI Technologies Co., Ltd.	York, PA	100.0
	SS Great Lakes LLC	Bridgeport, MI	100.0

	Company name	Registered office	Percentage share of capital held
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.	Hulunbeier	100.0
	Bosch Automotive Components (Changchun) Co., Ltd.	Changchun	55.0
	Bosch Automotive Diagnostics Equipment (Beijing) Ltd.	Beijing	100.0
	Bosch Automotive Diagnostics Equipment (Shenzhen) Ltd.	Shenzhen	100.0
	Bosch Automotive Products (Chengdu) Co., Ltd.	Chengdu	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
	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
	Loos China Ltd.	Hong Kong	100.0
	Nanjing Bovon Power Tools Co.	Nanjing	50.0
	Bosch Automotive Products (Nanjing) Co., Ltd.	Nanjing	100.0
	Bosch Thermotechnology (Shanghai) Co., Ltd.	Shanghai	100.0
	Bosch Thermotechnology (Wuhan) Co., Ltd.	Wuhan	100.0
	sia Abrasives Company Ltd.	Hong Kong	100.0
India	Bosch Electrical Drives India Private Ltd.	Chennai	85.5
	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
Israel	Utilight Ltd.	Yavne	22.3
Japan	Advanced Driver Information Technology Corporation	Kariya	50.0
	Bosch Engineering K.K.	Tokyo	100.0

	Company name	Registered office	Percentage share of capital held
	Kanto Seiatsu Kogyo Co., Ltd.	Honjo	94.9
	Knorr-Bremse Commercial Vehicle Systems Japan, Ltd.	Tokyo	20.0
	Mecman Japan, Ltd.	Saitama-shi	40.0
Korea	Doowon Precision Industry Co., Ltd.	Seoul	40.0
	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
Thailand	FMP Distribution Ltd.	Rayong	50.1
	FMP Group (Thailand) Ltd.	Rayong	50.7
	Pacific BBA (Thailand) Ltd.	Bangkok	100.0
Vietnam	Robert Bosch Engineering and Business Solutions Vietnam Co. Ltd.	Ho Chi Minh City	100.0
Rest of the world			
Australia	Beissbarth (Australia) Pty. Ltd.	Thomastown	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
New Zealand	Bosch Rexroth Ltd.	Auckland	100.0
South Africa	Hägglunds Drives South Africa (Pty.) Ltd.	Fourways	100.0

Stuttgart, March 7, 2013

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, 2012 to December 31, 2012.

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, 2012 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, 2012 to December 31, 2012. 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 7, 2013

PricewaterhouseCoopers
Aktiengesellschaft
Wirtschaftsprüfungsgesellschaft

Harald Kayser
Wirtschaftsprüfer

Dieter Wißfeld
Wirtschaftsprüfer

Ten-Year Summary of the Bosch Group

T.74

Currency figures in millions of euros	2003[1]	2004[2]	2005[2]	2006	2007	2008	2009	2010	2011	2012
Sales revenue	**36,357**	**38,954**	**41,461**	**43,684**	**46,320**	**45,127**	**38,174**	**47,259**	**51,494**	**52,464**
of which generated outside Germany (as a percentage)	71	72	73	74	75	74	76	77	77	77
Research and development cost[3]	2,650	2,715	3,073	3,348	3,583	3,889	3,603	3,810	4,190	4,787
as a percentage of sales revenue	7.3	7.0	7.4	7.7	7.7	8.6	9.4	8.1	8.1	9.1
Capital expenditure	2,028	2,377	2,923	2,670	2,634	3,276	1,892	2,379	3,226	3,151
of which in Germany	1,002	1,057	974	968	1,138	1,610	928	1,023	1,161	1,115
of which outside Germany	1,026	1,320	1,949	1,702	1,496	1,666	964	1,356	2,065	2,036
as a percentage of sales revenue	5.6	6.1	7.0	6.1	5.7	7.3	5.0	5.0	6.3	6.0
as a percentage of depreciation	118	135	156	116	108	136	80	100	142	107
Depreciation of property, plant, and equipment	1,713	1,758	1,870	2,309	2,428	2,410	2,374	2,373	2,265	2,948
Annual average number of associates (thousands)	229	234	249	258	268	283	275	276	295	306
of which in Germany	105	107	110	110	111	114	113	112	117	119
of which outside Germany	124	127	139	148	157	169	162	164	178	187
as of Jan. 1 of subsequent year	232	238	251	261	271	282	271	284	303	306
Personnel expenses	10,994	11,179	11,936	12,534	12,896	12,994	12,787	14,132	14,719	15,663
Total assets	**31,995**	**41,170**	**45,554**	**46,940**	**48,568**	**46,761**	**47,509**	**52,683**	**54,616**	**56,326**
Equity	11,760	17,428	20,943	22,482	24,825	23,009	23,069	26,243	26,917	26,884
as a percentage of total assets	37	42	46	48	51	49	49	50	49	48
Cash flow	3,727	3,977	4,352	4,521	5,052	4,032	1,910	5,460	4,959	4,538
as a percentage of sales revenue	10.3	10.2	10.5	10.3	10.9	8.9	5.0	11.6	9.6	8.6
Profit after tax	1,100	1,870	2,450	2,170	2,850	372	–1,214	2,489	1,820	2,342
Unappropriated earnings	60	63	63	69	72	75	67	82	88	88

[1] The provisions of the German commercial code were applied through 2003
[2] With the exception of profit after tax, without discontinued operations
[3] Including development work charged directly to customers

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Robert Bosch Stiftung

Group Management Report

Consolidated Financial Statements of the Bosch Group

Published by
Robert Bosch GmbH
Corporate Communications,
Brand Management, and
Sustainability (C/CC)

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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**

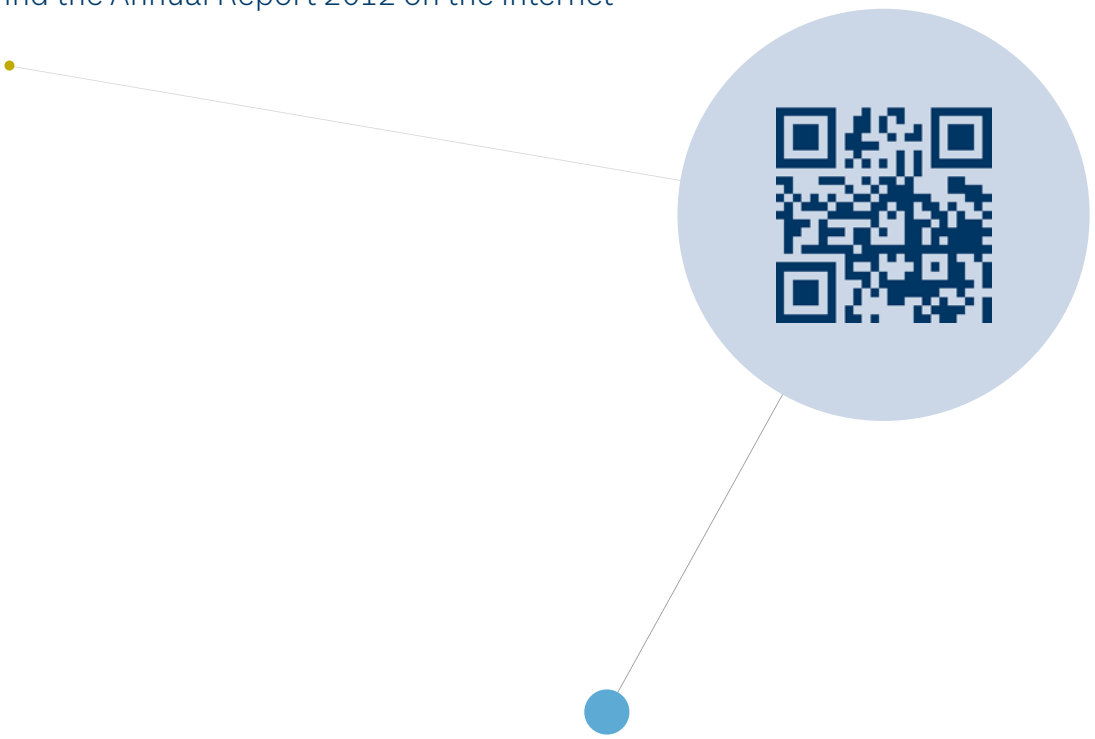
For an online version of this Annual Report, go to:
www.bosch-presse.de/Annualreport

Idea, design, and pre-press
dalladea, Sindelfingen, and heureka, Essen

Print
Druckpartner, Essen

Available online

To find the Annual Report 2012 on the internet



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Printed in Germany

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