

ENERGY AND BUILDING

SOLUTIONS

2020

A Magazine About Security, Comfort and Efficiency in Commercial Buildings

In full swing

Page 14



BOSCH

Invented for life

GFR Specialist:
The System Behind
the Solution

Page 4

Interview:
How Smart Will
Your Building Be?

Page 10

Digital
Building Twin:
Right on Track

Page 36



Dear readers,

The digital transformation is in full swing and proceeding rapidly. Practically every company is in a process of change. Digitalization and IoT bring challenges, but also open up a wealth of opportunities. We see ourselves as a partner who is actively involved in our customers' digital transformation. That's because innovative technologies alone are not enough. Only holistic solutions with vision can produce the most sustainable effects, leading to further ideas for new IoT-based services.

Our main focus is on the added value created for people. Greater safety, security, and comfort, more time and productivity through efficient processes, as well as increased climate protection for an environment worth living in.

This year, Bosch has achieved CO₂ neutrality and is thus playing a pioneering role worldwide. A key lever for this is increasing energy efficiency. And here, too, intelligent digital solutions are a great help to us. You can benefit from our expertise in this important area. Let us tackle the future together.

In this spirit, I wish you an enjoyable read.

THOMAS QUANTE

Executive Vice President
Bosch Energy and Building Solutions



10



14



32



40

Contents

- 4 **SHINING EXAMPLES**
- 8 **IN BRIEF**
- 10 **NEW OPPORTUNITIES THANKS TO DIGITALIZATION: AN INTERVIEW WITH VERA SCHNEEVOIGT AND MARCUS NADENAU**
- 14 **COVER STORY: TRUE BEAUTY, INSIDE AND OUT**
The Curve is the name of BABOR GmbH & Co. KG's new headquarters. And a fully connected solution from Bosch ensures building safety and security.

decide

- 22 **USA: CUSTOMERS FOR LIFE**
- 25 **TECHNOLOGICAL PROGRESS FOR A TRADITIONAL COMPANY: THE TAJ MAHAL PALACE HOTEL**

perform

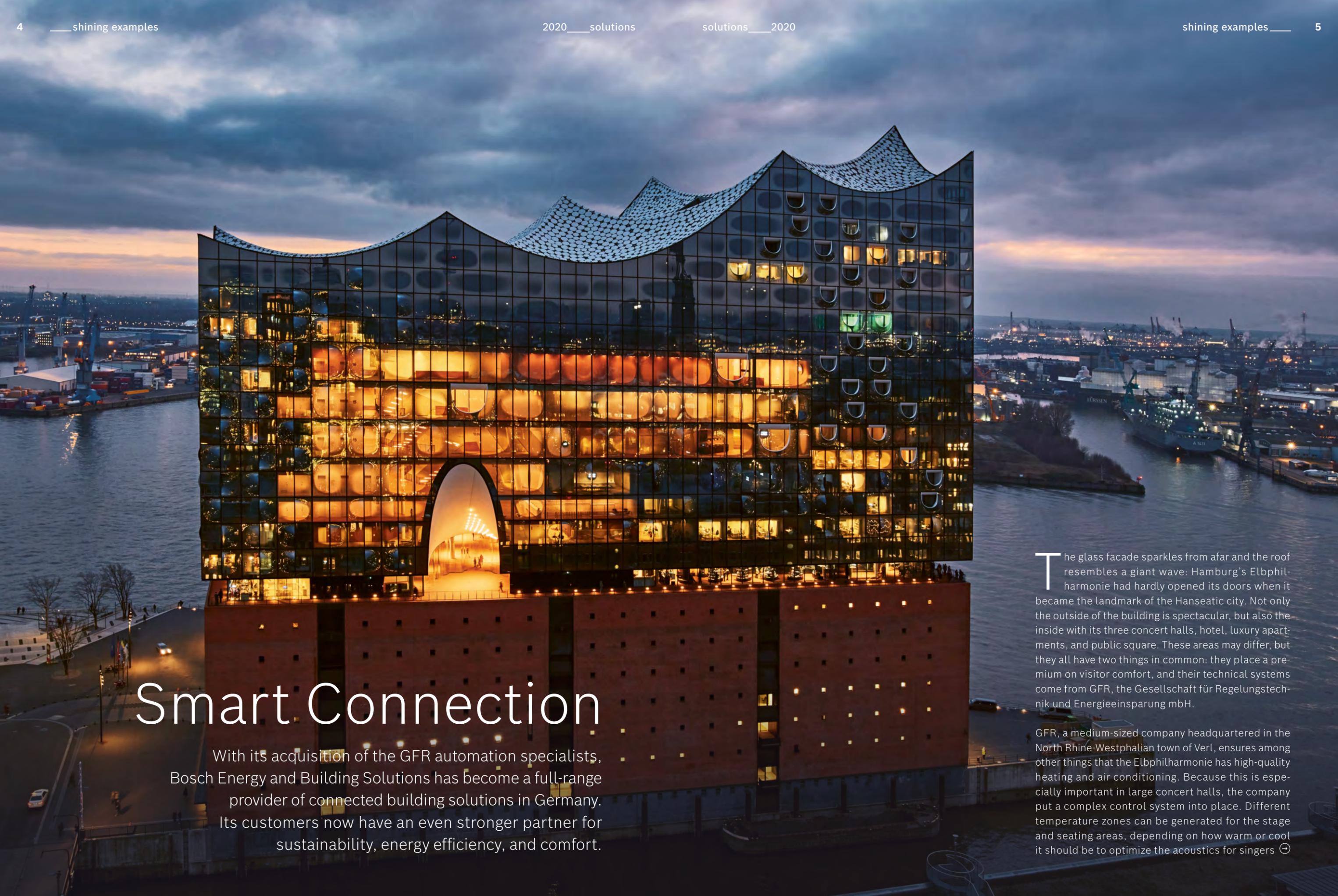
- 26 **SUSTAINABILITY: CLEVER MINDS, CLEVER CONCEPTS**
- 30 **REORGANIZATION: 100 PERCENT CUSTOMER-ORIENTED**
- 31 **IN BRIEF**
- 32 **IMPROVED EFFICIENCY**
Connected solutions contribute significantly to greater resource efficiency in manufacturing companies.

think ahead

- 36 **WHEN DIGITALIZATION LEADS THE WAY**
- 38 **DIGITAL PERSONNEL MANAGEMENT**
- 40 **PROTECTION AGAINST CYBERATTACKS**
In Germany, Bosch offers new services to meet the expanding requirements for information security.
- 42 **PUBLISHER INFORMATION**
- 43 **BEYOND THE NORM**

ABOUT THE COVER

The Curve: at the BABOR cosmetics company's new headquarters in Aachen, a connected solution from Bosch ensures comfort and security.



Smart Connection

With its acquisition of the GFR automation specialists, Bosch Energy and Building Solutions has become a full-range provider of connected building solutions in Germany. Its customers now have an even stronger partner for sustainability, energy efficiency, and comfort.

The glass facade sparkles from afar and the roof resembles a giant wave: Hamburg's Elbphilharmonie had hardly opened its doors when it became the landmark of the Hanseatic city. Not only the outside of the building is spectacular, but also the inside with its three concert halls, hotel, luxury apartments, and public square. These areas may differ, but they all have two things in common: they place a premium on visitor comfort, and their technical systems come from GFR, the Gesellschaft für Regelungstechnik und Energieeinsparung mbH.

GFR, a medium-sized company headquartered in the North Rhine-Westphalian town of Verl, ensures among other things that the Elbphilharmonie has high-quality heating and air conditioning. Because this is especially important in large concert halls, the company put a complex control system into place. Different temperature zones can be generated for the stage and seating areas, depending on how warm or cool it should be to optimize the acoustics for singers ☺

and instruments. The technical systems operate exceptionally quietly, in order not to detract from listener enjoyment. GFR also provided the control center for the building's technical equipment. Among other tasks, it regulates around 260 ventilators, 1,900 fire dampers, and 600 smoke exhaust and multi-leaf dampers.

The contract for the Elbphilharmonie is just one of numerous milestones in GFR's history. Founded in 1978 and currently employing around 280 people at nine locations in Germany, the company is one of the country's leading providers of building automation systems. Its clients include planners, construction firms, and general contractors seeking solutions for commercial buildings. With a broad portfolio of services and products, GFR serves many sectors. Its projects include shopping centers, office buildings, hospitals, and hotels. It not only equips new buildings but also modernizes existing ones, such as Munich's Olympic Hall, for which its automation experts renewed the technical systems and converted them to a modern network protocol.

GFR was acquired by Bosch Energy and Building Solutions in October 2019. Now part of Bosch's Building Technologies, this system integrator expands the division's range of solutions for commercial buildings. Mega-developments like climate change, urbanization, the digital transformation, and rising demand for quality of life are leading to major changes in infrastructure and commercial buildings. As the needs for safety, comfort, and efficiency increase, so too does the demand for integrated overall solutions. Greater levels of connectivity via



“Together we can offer our customers integrated overall solutions that meet the future need for comprehensive and sustainable building automation.”

VOLKER WESTERHEIDE

the Internet of Things are opening up many different ways of improving, accelerating, and automating processes in commercial buildings.

With more than 3,000 experts, Energy and Building Solutions develops and implements sector-specific solutions in Germany to make commercial buildings safer, more comfortable, and more energy-efficient. With its comprehensive expertise in automated building systems, GFR supplements this portfolio in superb form. “Together we can offer our customers integrated overall solutions that meet the future need for comprehensive and sustainable building automation,” says GFR Managing Director Volker Westerheide. The expanded expertise makes Bosch a full-range provider in Germany that offers its customers connected solutions and services for safety, energy efficiency, and building management.



The Elbphilharmonie's technical center is located in the building's peak – a superb position with a view of the Elbe River. It ensures the right air conditions for both people and musical instruments.

In strategic terms, this is an important step. People now spend an average of 90 percent of their time in closed spaces. Ever greater importance is therefore being attached to the best possible control and regulation of building and room functions – such as air quality. Clients focus not only on comfort, but also on areas like employee health, sustainability, environmental protection, and energy consumption. Moreover, markets are changing due to the influence of the Internet of Things. “There are now many ways of using smart technologies to control buildings, enhance their use, and make them more energy efficient,” notes Westerheide. Numerous types of added value arise for building owners and users. For example, a well-equipped office building highlights an employer's attractiveness, and shopping centers use automated air-conditioning systems to

enhance customer comfort and thereby encourage them to stay longer.

With GFR, Bosch now has an expert on board who can provide building automation systems from a single source as well as complete project supervision. Its portfolio includes project planning, engineering, installation of automation systems, monitoring, energy management, and expert 24/7 services. Of note is also the fact that GFR develops crucial hardware and software itself, such as the WEBVISION5 building management platform. Its portfolio includes its own control cabinet assembly. GFR is also expected to develop its own project planning and management tool to enable customers to track the status of their projects online. By joining forces, Bosch and GFR have intensified their innovative power and seek to continue providing new direction to markets in the future. ●

CAMERA WITH INTELLIGENT ALGORITHMS

Video-Based Fire Detection System for Mohn Media

MOHN MEDIA MOHNDRUCK GMBH, a member of the BERTELSMANN Printing Group, is one of the leading print and media service providers in Europe. At the Gütersloh site, around 2,000 employees use state-of-the-art machinery to produce bespoke print products and services for customers from various industries. Bosch has been supporting the print specialist with cutting-edge security technology and services over several generations of systems.

An average of 300 tons of waste paper is stored in the eight-meter-high halls of the Mohn Media waste paper center. Any malfunction in the disposal process would directly affect production. In order to be able to react to fire incidents in this sensitive area as early as possible, Bosch experts planned and implemented a connected solution with AVIOTEC, the first video-based fire detection system certified by VdS Schadenver-

hütung GmbH. Intelligent algorithms integrated in the camera detect smoke and flames early on. Particularly in large-volume, sophisticated buildings, this technology enables significantly more reliable detection than conventional detectors, which always depend on smoke migrating to them.



If AVIOTEC identifies danger, the Bosch Video Management System sends a direct alarm to the emergency service control center of the plant's on-site fire department. The situation can be checked on the video monitor and, if necessary, measures can be initiated immediately. Thus, in case of an emergency, major damage and production downtimes can be avoided. All fire protection and video surveillance systems integrated on site are managed using the Bosch Building Integration System. The security systems can be controlled centrally or autonomously by security personnel. Any other companies located on the Bertelsmann Printing Group premises also benefit from this configuration. "These innovative solutions continue to inspire us time and time again. That's why Bosch has been a Bertelsmann partner for over 35 years," says Jörg Naumann, head of the Mohn Media Mohndruck GmbH in-house fire department.

COMPREHENSIVE PROTECTION FOR COMPANY PREMISES

Intelligent Combination

THOMANN GMBH is the world's biggest shipper of musical instruments, light and sound equipment. Bosch's solution provides wall-to-wall protection for the premises of the mid-size company. The concept combines a fire alarm system, intrusion protection, and access control, and is continuously expandable. More than 1,000 fire detectors are in use, and critical

areas have been equipped with special detectors. The integration of all systems into the Building Integration System facilitates the handling of security technology. With Effi-Link Software Assurance, the system is always kept up to date. In addition, the Bosch experts take on the maintenance and service duties for the security solution.

AUTOMATED VIDEO DOCUMENTATION

Is the Truck Loaded Correctly? Of Course!

AROUND 70 PERCENT of trucks on Germany's roads travel with loads incorrectly or insufficiently secured. Meanwhile, proper load securing could prevent around 20 percent of truck accidents. By law, it's not just carriers or drivers who are responsible for load securing. Even shipping companies must fundamentally ensure that a truck load leaving their premises is properly secured. The business can otherwise be held liable for this.

For this reason, it is important to have documentation tracing the proper loading of goods and wares on trucks. Using a modern solution, the loading process can be automatically recorded and retained on video. Here, two considerable advan-

tages are directly linked to each other – more safety and more economy. As soon as a truck drives into a pre-defined loading zone, camera recording starts. The truck is identified – and this is where documentation of the loading process begins. The privacy of persons involved can be reliably protected through optional pixellation. The system is intelligent and can differentiate trucks from other vehicles. Because it is fully automated, shippers do not need to use their own staff for manual documentation. In addition, the software is clear and very easy to operate. Thus, recorded loading processes can, for example, be exported at the push of a button and can be quickly located as a file if the business requires the respective



documents for any legal questions. The system has the welcome side effect of motivating employees to work as carefully and conscientiously as possible. Moreover, the solution can be linked to other business systems as well. For example, work lighting can be switched on when a truck drives into the loading zone. Or a crane operator on the premises is notified automatically of the vehicle's arrival – two examples demonstrating the reduction of the risk of work accidents and the improvement of work conditions.

100

YEARS of competence in security solutions – from Hanseatische Notruf AG to Bosch Building Technologies. The Bosch Building Technologies division can thank its oldest roots for its 100th anniversary in 2020: product competence in emergency services and security to save human lives. The date goes back to the founding of Hanseatische Notruf AG in

the year 1920. This business developed alarm technologies and functioned as an emergency call receiving station for police in Hamburg. This expertise finally arrived at Bosch in the 1980s via several successor companies, where it encountered communication technology that was already widely anchored in the industry. From 1981 onward, the portfolio steadily expanded, at first under Bosch Telecom. Through numerous company acquisitions and portfolio

expansions, security technology finally became an independent division within Bosch in 2002, employing some 9,000 associates. The wide-ranging portfolio of today's Bosch Building Technologies division focuses on the protection of human life, buildings, and goods.

100 Years
Bosch Building Technologies
1920–2020

“ In a few years we’ll be talking about **BUILDING IQS** ”



In this interview Vera Schneevoigt, Chief Digital Officer and Senior Vice President responsible for Engineering at the Bosch Building Technologies Division, and Marcus Nadenau, Senior Vice President Energy and Building Solutions Europe, talk about new opportunities arising from digitalization.

Ms. Schneevoigt, Mr. Nadenau, digitalization is a megatrend that affects us all. How is it influencing the field of commercial buildings?

Vera Schneevoigt: Digitalization is triggering major new developments and opening up many ways to increase safety, comfort, and efficiency. But it is a very complex process and is also closely linked to a lot of other trends in areas like energy, climate protection, and sustainability, to name a few. For new buildings, we’re now seeing many trades, architects, planners, installers, and operators devoting a lot of attention to digitalization. For our part at Bosch, we’re already very good at contributing building technology and management as a system integrator.

Marcus Nadenau: As far as overall building intelligence goes, there are already some concepts on the market, but they’re not very widespread. In five or ten years, I think we’ll be ☞

talking about building IQs. These IQs will tell us things like how the building supports us in our work and other processes. And we'll get there by analyzing data in intelligent ways. This is an important area that we'll be utilizing to advance new services for our customers.

Will greater digitalization also mean greater demands on Bosch as a system integrator?

Marcus Nadenau: Yes, because we're shifting ever more from the real world with its hardware to a world that uses a sort of digital image of our buildings – or "digital twins." New business

models are arising along with professional services that rely on many different domains. Consultancy is playing an ever greater role. But in terms of the direct connection with our end customers, nothing has changed.

Are we also talking about providing building intelligence as a service?

Marcus Nadenau: Over the long term, yes. In ten years we'll be offering many more services relevant to intelligent buildings. Imagine a virtual assistant in a conference room, for example, that hosts meetings as efficiently as possible and draws attention to unequal speaking time, or helps with translations. Data can be used to create a lot of similar possibilities. But buildings will not get an IQ of 155 overnight. There are some important intermediate steps. Data security, for example, is a crucial issue. That's why, since last year, we've been offering services that protect against cyberattacks.

Vera Schneevoigt: Digital twins, which give us comprehensive copies of buildings with relevant aspects including all the technologies, systems, and sensors, are helping us develop these types of services. That used to be a very time-consuming, manual process with individual systems. But digital twins provide a completely new level of transparency and also enable new ways of integrating buildings actively into our living and working environments. However, we shouldn't overlook the fact that many factors are influencing our previous views and habits. Just one example: right now I live in this location and commute to a certain building for work – will that remain the case as our work environments become ever more agile and digital? These and other trends are opening the door to new needs and expectations on the part of both users and decision makers – all of which we are considering in how we develop the relevant services.

Bosch considers AI (artificial intelligence) to be a crucial technology for the future.

How important is AI for your field of work?

Marcus Nadenau: We're using AI right now in Aviotec video-based fire-detection systems.



Vera Schneevoigt: "Digitalization is triggering major new developments."

We're also exploring AI in other video-based applications. We're using AI algorithms in our energy management solutions to predict future consumption patterns and thus avoid unnecessary costs arising from situations like peak loads.

Vera Schneevoigt: AI lends itself well to decision and use-based management – especially considering how difficult it would be for people to do it all on their own. AI turns objects into intelligent assistants and makes our lives easier in the process. For example, we're working with other Bosch divisions to test ways

of using video technology in connection with the sensors in self-driving cars to develop an integrated traffic management system.

What demands is greater digitalization placing on associates?

Vera Schneevoigt: Digital expertise requires lifelong learning, and it affects nearly every level of the company. At a company like Bosch, associates essentially receive free training in digitalization – merely working for Bosch is a form of continuing education in the area. The question is not only what opportunities we have today, but also what we will need for the future. What types of training can we offer people who come from other fields, and what types of additional qualifications are on offer? We're working intensively on these matters.

Marcus Nadenau: Absolutely – we're investing in the digital skills of our associates. And we've been focusing our organization on these market dynamics since the beginning of the year. We've been concentrating more on our intelligent building solutions, for example, and are consolidating key areas of expertise.

Are you involving customers directly in developing these new ideas and solutions?

Marcus Nadenau: That's very important to us. We're developing solutions and services that are very closely tailored to the needs of our customers. We enter into joint development agreements with them, in which both sides contribute and benefit equally. We solicit UX feedback from our customers, adapt our processes accordingly, and keep testing them. We view ourselves as a partner who plays an active role in the digital transformation processes of our customers.

Vera Schneevoigt: Yes, we're a very interesting partner for our customers. The whole Bosch ecosystem gives us a lot of room for innovation in the Building Technologies division. Moreover, we have the technological resources not only to shape our own digital transformation but to provide our customers with the best possible solutions.



Marcus Nadenau: "Closely tailored to customer needs."

True Beauty, Inside and Out

BABOR GmbH & Co. KG has put considerable effort and resources into its new headquarters, known as "The Curve." The cosmetics company sought and achieved a futuristic design, cutting-edge workstation and sustainability standards – and a fully connected overall solution from Bosch.



*
Fire detectors
in the customer
training center



Take a deep breath, feel the sun on your face, and gaze out into the distance. We are at the highest observation point in Aachen – the penthouse of “The Curve,” the new headquarters of the Babor cosmetics company. Surrounded by highly modern lounge furnishings, we are enjoying a panoramic view out over the imperial city. Babor’s delight in beauty and quality can be felt everywhere: flowers on wall tiles from the company’s previous training center adorn the makeup instruction room, new offices feature inviting open-

space workstations, and a sumptuous bouquet of gladiolas greets us in a reception area suffused with natural light. Since opening in March 2019, The Curve is Babor’s new calling card. Thanks in part to a customized and fully connected security solution from Bosch.

TRADITION MEETS INNOVATION

Founded in 1956 by Dr. Michael Babor, Babor is one of the most familiar names in the cosmetics sector worldwide. Although currently represented in more than 70 countries, its high-grade products continue to be developed and produced in Aachen. Around 450 staff members work on research, development, production, marketing, and logistics at the headquarters in Neuenhofstraße. “As a premium cosmetics producer



BABOR’s reception
and visitor registra-
tion area

we clearly also need exceptionally high quality in our site security,” says Dirk Leßmann, Babor’s Director Plant Management. “We invested more than €20 million in the new building and in intelligent connections to the existing facilities. For a project of this size we needed someone we could rely upon 100% and who would also always be thinking a step ahead. With Bosch we found exactly the partner we wanted.”

SECURE AND DISCREET

The futuristic complex now connects the previous administrative wing with the production and logistics halls, and has the space for 150 new office spaces and an expanded shipping department. With its curved visuals and more than 5,000 square meters of floor space, The Curve posed ↻



Visitor self-registration
at a terminal in
the reception area



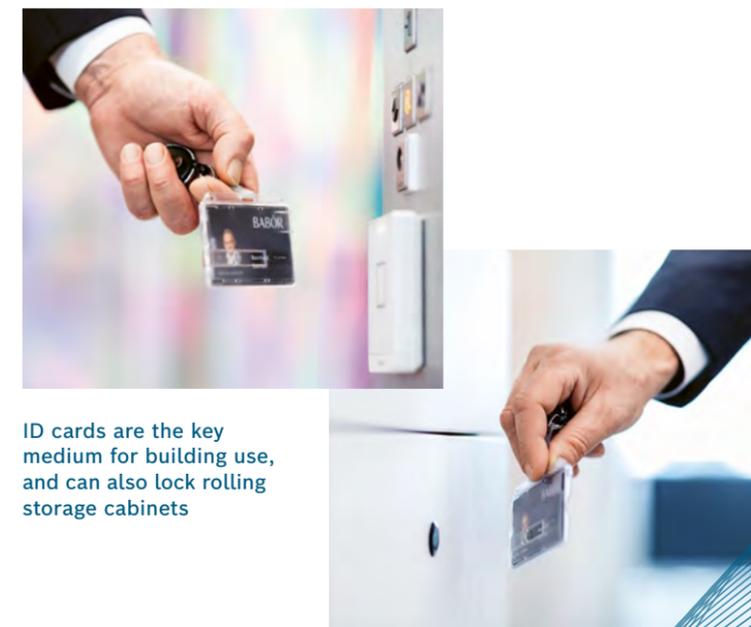
From left to right:
Uwe B. Herrmann (Bosch),
Dirk Leßmann and
Reinhold Stenten (BABOR)



Hidden technical
systems in The Curve's
open-space office area

some challenges to security. Hundreds of employees, cosmeticians, customers, and visitor groups enter the building every day. The company makes more than 50 million beauty ampoules a year, and a total of nearly 150 million filled products. "To protect the people in the building as well as our products we have to ensure the highest level of security around the clock," says Leßmann. "Yet at the same time, no one should feel troubled by the requisite technical systems." As BABOR Division Manager Engineering Department / Facility Management Reinhold Stenten adds, "Employee satisfaction is crucial to our company's success – which makes intelligent building security a major prerequisite."

The first step taken by Bosch Energy and Building Solutions was to develop a smart safety and security concept – customized to meet BABOR's needs and organizational qualities. The overall solution includes fire and intrusion alarm systems, time and access control, video surveillance, perimeter protection, an ID card generation system, and both visitor and parking management systems. "All the building areas and solutions are intelligently connected. All the data for the technical and security systems flow into the Building Integration System (BIS) so our personnel can monitor and control them easily and efficiently," ex-



ID cards are the key
medium for building use,
and can also lock rolling
storage cabinets

plains Uwe B. Herrmann, Sales Manager for Bosch. The Bosch experts then modernized the security equipment in the old building areas in order to create a homogeneous system landscape, extend the connected solution's added value to all the facilities, and ensure a future-oriented state of technology.

The technology is integrated unobtrusively into the building. "Aesthetic cosmetics ⊕



“Aesthetic cosmetics need aesthetic technologies. And ‘The Curve’ represents the BABOR brand – it’s our calling card.”

DIRK LESSMANN

need aesthetic technologies,” notes Leßmann. “And ‘The Curve’ represents the BABOR brand – it’s our calling card.” With great attention to detail, sensors were positioned between the wooden slats in offices, fire detectors and ceiling colors were matched, and modern RFID readers with glass surfaces were integrated into the interior in pleasing ways. Perimeter protection is also based on the latest technology. “We used intelligent video and sensor systems to create a virtual fence that completely surrounds all the buildings. That

lets us maintain the company’s philosophy of openness despite the heterogeneous structure of the site,” adds Herrmann in describing the complex solution.

ONE ID, MANY OPTIONS

To increase security, comfort, and efficiency, Bosch also developed an innovative visitor management system for BABOR. The newly introduced IDs give employees the equivalent of a Swiss army knife for their everyday actions. The RFID units track time and authorize access for their users, and also serve as photocopy cards and keys to office storage containers – not to mention as IDs for personnel sales. “In contrast to the complex key and accounting systems we used to have, the new system gives us security and cost assignment with a single click,” explains Leßmann. The employee ID cards can also accommodate an unlimited number of new solutions. “We can add further applications to the highly secure transponder technology in the ID cards at any time,” says Herrmann.



Manufacturing and site equipment in a BABOR production hall



* Alarm system at BABOR’s filling department



Precision filling of BABOR beauty ampoules

SHARED GOAL OF CO₂ NEUTRALITY

The project’s complexity made it especially important for BABOR to have a set contact at Bosch for all the skilled trade work – from initial consultations to final acceptance. “We analyzed the actual processes together with BABOR right from start, of course including our client in the conceptual stage, and always found solutions together,” says Herrmann. Leßmann has high praise for the successful collaboration, noting that “for both partners, the project was a real matter of the heart.”

With The Curve now complete, the two companies have a new goal: carbon neutrality. “We consider ourselves very fortunate in having a partner like Bosch who is also very serious about achieving this aim,” says Leßmann. The two sides are already jointly planning to integrate an energy management system into the existing technologies at the Aachen headquarters as well as a security solution into BABOR’s future production and logistics site in Eschweiler. ●

Wanted: Customers for Life

For over four decades, the Bosch subsidiary Climatec has become one of the largest privately-held providers of building technology and energy solutions in the U.S. This is due to its industry expertise – and its remarkable focus on customer satisfaction.

Dickies Arena in Fort Worth: New home for spectacular events

When the first event was held at Dickies Arena in Fort Worth in November of last year, people traveled thousands of miles from all over the country to enjoy a state-of-the-art performance by Twenty One Pilots. The 14,000-seat, \$540 million arena was built with funds from the city of Fort Worth, the state of Texas, and private-sector participants—making Dickies Arena a heavyweight in the competition for major events. Located 30 miles from Dallas with over 850,000 residents, the city seeks to establish itself as a destination for spectacular cultural events with Dickies Arena.

Built to be a true multi-use facility with world-class technology and design, Climatec installed an integrated security platform with video, access and intercom solutions. Headquartered in Phoenix, Arizona and founded in 1975, this Bosch subsidiary is an independent provider for integrating building systems such as energy efficiency, automation, and security solutions with a team of more than 800 associates.

The leaders of the project in Fort Worth wanted cutting-edge technology throughout the arena. “One challenging task, for example, was to enable all the entrances around the arena to be monitored,” says Mauro Lima Vaz, Managing Director of Climatec. Video, access, and intercom solutions that meet the requirements of a modern arena format now ensure the greatest possible security for the thousands of visitors and the greatest possible satisfaction for the customer.

COMPLETE CUSTOMER SATISFACTION

“That is our greatest goal,” says Lima Vaz. “We want to build customers for life, so we must always think like a customer.” This approach shapes the company’s culture. “Our business partners appreciate the fact that it’s simple and uncomplicated to work with us. We try to limit the bureaucratic side of the process as much as possible.”

People-centered and friendly—these are the company’s guidelines, both internally and externally. This approach generates measurable results: surveys report more than 95 percent customer satisfaction, and the repeat-customer rate is similarly high. Many customer relationships date back to the early days of the company, and more than 80 percent of the company’s work comes from existing business relationships.

A key factor in these relationships is the expertise needed to meet high demands. Climatec’s solutions control heating, ventilation, air-conditioning, lighting, central control, and critical building peripheral systems. As a system integrator, Climatec combines legacy systems with modern building automation into seamless solutions. With locations in five states, the company specializes in long-term, sustainable, and energy efficient solutions. As a member of the U.S. Green Building Council, it is “the first choice for making buildings energy-efficient and environmentally friendly,” says Lima Vaz. Drawing on decades of experience, its expertise also covers intelligent and reliably integrated security solutions

for buildings as well as software-based analysis, optimization, visualization, and energy-efficiency options.

SMART CONTROLLED – 212 DOORS, 365 CAMERAS

At Dickies Arena in Fort Worth, this expertise yielded a solution that combines several leading technologies. Bosch PTZ cameras work with intelligent video analytics to follow and never lose moving objects, and automatically crop and zoom. The data is saved with H.265 compression technology – without any significant loss in quality. The OnGuard open security platform from Lenel and Milestone XProtect video monitoring software enable innovative

“Complete customer satisfaction, that is our greatest goal.”



Mauro Lima Vaz,
Managing Director
of Climatec

security management and smooth central command control. Forensic capacities permit the stored material to be searched with new criteria at any time.

A total of 212 doors at Dickies Arena are now electronically monitored, along with elevators, parking lot access, and integrated security bollards. The 365 cameras monitor every corner of the arena. They include a 5K camera in a video cube below the ceiling; this device replaces as many as 53 conventional VGA cameras.

SMART MINDS, SMART TECHNOLOGY

Another very satisfied customer of Climatec is located in southern California. Victor Valley College is pleased to have left a problematic period of building security behind. There were major challenges – including non-

JASON POSTON, PROJECT MANAGER, CLIMATEC

“The repeated business of changes and upgrades for Dickies Arena continues to show our customer’s support of Climatec and their confidence in us to get the job done right, on time, and on budget. The customer has indicated they expect to work with us long into the future.”



compatibility among separately installed systems and the lack of a graphics standard—but a solution was quickly developed. Climatec has installed a security system that now covers the entire campus. It did so without any break in service, and the new system can be controlled from anywhere in the world – by any smart

device that is HTML5-compatible. Climatec’s work increases the security for this educational institution and makes the lives of its directors easier. Here, too, smart technology for smart minds has led to a “completely satisfied customer,” as Lima Vaz notes. “The expectations were more than fulfilled.” Once again. ●

Technological Progress for an Iconic Hotel

An energy solution from Bosch is improving the carbon footprint of the Taj Mahal Palace hotel – while enhancing the comfort at this luxurious establishment even more.

The Taj Mahal Palace hotel in Mumbai is a national institution in India, with a fame rivaling that of its guests: King George V, Prince Charles, Mahatma Gandhi, and the Obamas have all stayed at this splendid building, as have the Beatles, Brad Pitt, and Mick Jagger. When it opened in 1903 it delighted guests with all manner of technological and other highlights: along with a laundry, Turkish bath, and post office, it also featured electricity, fans, and elevators – all of which were luxuries at the time.

More than a century later, the hotel management decided to reduce specific energy consumption and chose to partner with the Indian team at Bosch Energy and Building Solutions for this ambitious project.

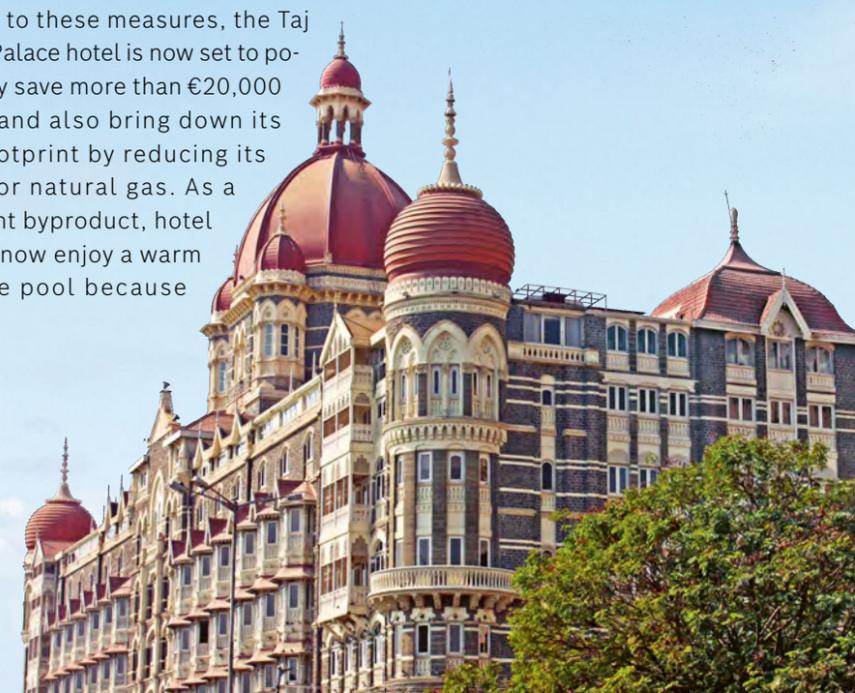
The water for the kitchens and guest rooms at the Taj Mahal Palace is

primarily heated using natural gas-fired boilers. The energy experts from Bosch conceived of an innovative solution to significantly lower gas consumption – and pursued it from the planning stage to implementation and operation. Flue gases from the boilers had previously been suctioned off at a temperature of up to 240 degrees Celsius. The team optimized steam distribution with a customized economizer, which recovers heat from the boiler’s flue gas to preheat water to the requisite temperature.

Thanks to these measures, the Taj Mahal Palace hotel is now set to potentially save more than €20,000 a year and also bring down its CO₂ footprint by reducing its need for natural gas. As a pleasant byproduct, hotel guests now enjoy a warm outside pool because

the water heated by the economizer is channeled not only to the kitchen and rooms but also to the hotel’s previously unheated 750,000-liter swimming pool.

This could be one more reason to stay at the iconic hotel. With its many comforts and conveniences for guests, the Taj Mahal Palace is not only one of the world’s most beautiful grand hotels but also one that can truly claim to bring tradition into line with sustainable energy management. ●



perform

Clever Minds, Clever Concepts – Working Together Towards Greater SUSTAINABILITY

We push climate protection for our customers and for ourselves. Since 2019, all Bosch sites in Germany have been climate neutral, and by the end of 2020 Bosch will no longer leave a CO₂ footprint anywhere in the world, from development to production and administration. Employees on three continents give us an insight into intelligent solutions.



Christoph Armbruster, Director of Sales Energy Services, Bosch Energy and Building Solutions, Germany

The issue of energy efficiency has a chance of success in a company as long as one thing is clear: that the boss takes it seriously, too. Intrinsic motivation must be led by example. In the manufacturing sector, energy consumption accounts for 3 to 4 percent of total costs. A much greater lever is resource efficiency. When our experts start work in a Bosch plant or on an external customer's premises, we take a holistic look at the plant. It is particularly effective to examine not only energy resources, but also input material, output material, and material and resource wastage. We connect the various strands of action and link the issue of energy with those of production and resource efficiency. Not only do we achieve financial benefits, we also significantly improve our customers' carbon footprints. Once I see the good results, it is a very meaningful, satisfying, and incredibly varied job.



Simon Mai, Application Engineer Energy Platform, Bosch Energy and Building Solutions, Germany

Understanding energy flows and end consumption better in order to become more efficient – that's where the Energy Platform that I'm helping to introduce comes in. The solution is now being deployed at more than 100 Bosch plants and sites around the world, and more sites are being added all the time. The Energy Platform is a cloud-based software solution for managing energy and resources. It visualizes energy consumption in real

time, which helps to identify possible savings as well as measures that can be used to increase potential. Every customer has their own focus. Are energy conversion processes such as refrigeration or compressed air generation to be recorded? Or should we concentrate on the benchmark of individual machines (or machine groups) in production? In the first step, it is advisable in any event to record the total consumption of a property separately according to media, i.e., to record how much electricity and/or gas is required over the year. Even this superordinate data provides valuable information through continuous, closely meshed, and automated recording. This is precisely the transparency provided by the Energy Platform. The intelligent solution has been so successful internally at Bosch that we are now marketing it externally.



Leon Chacon, Health, Safety and Environmental Manager, Bosch plant in Juárez, Mexico

As an environmental engineer in brake pad production, I make sure that everyone at our site understands how our activities directly or indirectly affect greenhouse gas emissions. We are looking for ways to reduce our CO₂ footprint. This includes combustion emissions from the gas-fired furnaces we use to manufacture our brake pads. A better understanding of our energy consumption enabled us to draw the following conclusions with the help of the Energy Platform: 70 percent of total energy consumption at the site is from electricity. By purchasing all our electricity requirements from a provider of renewable energy, we were able to reduce our CO₂ emissions by a total of 9,700 metric tons in 2018 and by a similar amount in 2019. Over the course of this year, we will install 1,500 photovoltaic modules over the parking lot. In addition to providing much-needed shade for employees' vehicles in the hot desert landscape of Juárez, the system will provide 850 MWh of renewable solar energy, which will save 491 metric tons of CO₂ emissions per year over the system's 25-year life span.

Tobias Volkmar, Project Manager CO₂-Neutral Manufacturing Site, Bosch plant in Eisenach, Germany

In collaboration with our colleagues from Bosch Energy and Building Solutions and their Energy Platform, we will eliminate the need for natural gas at the Eisenach plant and better understand our energy consumption by increasing transparency and thus finding new potential for optimizing our energy value stream. The resulting efficient use of energy helps us to implement the heat revolution, for example by adjusting our heating and cooling supply and improving heat recuperation. The greatest challenge here is the interdependence of the individual supply media, which makes the issue of the heat revolution very fragmented – because our top priority is the uninterrupted and fault-free supply to production. If we succeed, we can save around six gigawatt-hours or 1,200 metric tons of CO₂ a year while reducing our natural gas consumption in absolute terms.



Sandra Schwenger, Project Developer Energy Services, Bosch Energy and Building Solutions, Germany

We develop concepts that increase energy and resource efficiency and implement them in tandem with our customers. The focus here is on the elaboration and implementation of tangible measures and the development of holistic solutions – at the Eisenach plant, for example, the solutions need to cover everything from the energy consumer to the grid and on to generation. In addition to consulting and planning, we also implement the solutions and provide support during operation while optimizing systems and operating modes. One important tool in achieving this is the Energy Platform. The crucial factor is to implement the solution together with the customer within the project team and with the staff on site and to resolve the conflict between efficiency and profitability. Making a contribution to achieving the goals of a CO₂-free production site is a diverse field of activity. The ZeroEmission project combines further areas in this respect; in addition to the idea of efficiency, the use of renewable energies, innovative technology, and control optimization are also included.



Sudhir Bhujbal, Head of Building Management and Health, Safety and Environment, Bosch Electrical Drives production site near Chennai, India



Besides the entire infrastructure and supply, I am also responsible for energy management. As we are close to the sea here, the plant is generally exposed to high humidity and high temperatures throughout the year – the effects of climate change have made this even worse. Our energy consumption leads to considerable CO₂ emissions of 2,800 metric tons per year (2017). The aim was thus not only to compensate for our emissions but also to find sustainable and cost-effective ways to operate our plant. We focus on two main levers: improving energy efficiency and establishing internal electricity production from renewable energies. In addition to a transparent and microscopic view of energy consumption patterns, it is very important to improve working comfort for our employees while at the same time increasing energy efficiency. We have opted for an innovative, water-based, three-stage evaporative cooling system that provides pleasant humidity and cooling or ventilation depending on the ambient conditions. This implementation led to a compensation in CO₂ emissions of 405 metric tons per year. Switching to solar energy reduced our CO₂ emissions by a further 1,060 metric tons per year. Other measures such as increasing compressor efficiency, optimizing production machinery, intelligent lighting solutions, planned downtime management, and the purchase of renewable energy on the open market helped us to reduce our annual CO₂ balance by almost 1,200 metric tons. In 2017, our plant had an annual CO₂ balance of 2,800 metric tons. In December 2019, it was at 135 metric tons.



Srikanth N, Senior Project Manager, Bosch Energy and Building Solutions, India

I am responsible for the turnkey implementation of energy efficiency projects and specialize in energy solutions in the field of HVAC efficiency as well as process heat and cooling. Our customers include external companies, but also Bosch plants. Our solutions need to be able to achieve significant energy and CO₂ savings – otherwise, the project is a waste of time. That's why I ensure close coordination with our design and engineering team and consult with the customer in case of discrepancies. For Bosch in India, we have already successfully implemented the project for our integrated heating and cooling solution at five sites and have put in place solutions to increase efficiency in HVAC technology at four other sites. Overall, this alone has allowed us to save over 10,000 metric tons of CO₂ annually.

Focused, Specialized, and 100% Customer-Oriented!

Bosch Energy and Building Solutions Europe has been reorganized. Here, at a glance, are the most important benefits accruing to customers:

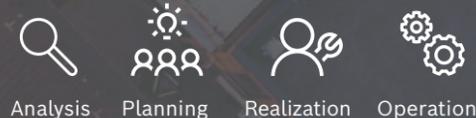
>55 locations

Our regional presence means that you'll find us close to where you are.

COMPREHENSIVE PORTFOLIO

- ✓ Fire alarm systems, public address, and voice alarm solutions in accordance with required DIN standards and guidelines
- ✓ Solutions for intrusion alarm, video, time and access control, and digital personnel management
- ✓ Complex tailor-made solutions for building security, building automation, and energy services
- ✓ Optimum maintenance of security systems by an experienced service team

CONNECTED AND INTEGRATED BUILDING SOLUTIONS FROM A SINGLE SOURCE



"We would like to be your first choice for technologies and services that make buildings safer, more comfortable and efficient."

**MARCUS NADENAU, SENIOR VICE PRESIDENT
BOSCH ENERGY AND BUILDING SOLUTIONS EUROPE**

>3,300

experienced experts and specialized customer teams will support you as consultants, installers, and service providers.



An eye on the future
Megatrends such as digitalization and energy efficiency require a holistic view of building technology. Place your trust in our expertise and our range of smart building solutions.



Wide customer portfolio
As a partner with many years of experience, we can offer comprehensive expertise in many different sectors.

LUTHER MEMORIALS FOUNDATION

A Modern Solution in a Landmarked Area

IN WITTENBERG, everything is about Martin Luther. Among others, the Luther House and the house of Luther's parents are located in the historical old city and in Mansfeld. They bear witness to the life and works of the reformer and host his cultural inheritance. In modernizing the Luther House, the Augusteum, and the Melanchthon House, a connected security solution by Bosch has been integrated to best protect visitors and the building.

The experts planned and installed a fire alarm, intrusion detection, and video system for the landmark-des-

ignated building architecture. Via the Building Integration System, individual security systems are connected together and easy to operate. Thanks to intelligent video image analysis, undesired persons can be identified in real time. In an emergency, a direct connection from the site to the fire department and police brings help fast.

The Luther Memorials Foundation and Bosch are connected by a successful 20-year collaboration, in which the security technology update represented one step further. In particular, the modern solution



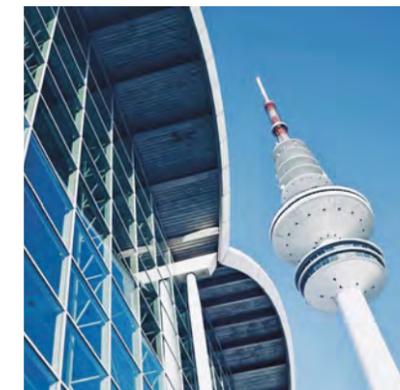
should ensure the temporary protection of special exhibits, as works of inestimable value are shown here. Theft detectors for display cases and hanging works of art as well as comprehensive full HD cameras give intruders no chance for success.

NEW EVACUATION SYSTEM FOR THE HAMBURG MESSE

More Security for 100,000 Square Meters

HOME TO more than 40 conferences and events annually and an attraction for visitors from all over the world: the modern grounds of the Hamburg Messe are centrally located in the heart of the city. Eleven halls bathed in light and external areas offer plenty of room for a diverse program on almost 100,000 square meters. From the leading international trade fair to regional events for consumers and smaller exhibitions – over 700,000 visitors enjoy this variety every year. Behind the scenes, Bosch provides a public address and evacuation system solution for greater security. In a dangerous situation, every second

counts, between the outbreak of a crisis and clearance of a high number of people from the spacious area. The new evacuation system, with its stan-



dard-compliant voice alarm system, fulfills the highest requirements here. To meet the technical requirements for the new system, the existing wiring system, among others, had to be completely replaced. Conference halls and the foyer can now be directly controlled via three connected locations. This makes announcements in different hall areas possible. To make them loud and clear, more than 1,200 loudspeakers and around 70 amplifiers were installed. The high quality of sound allows the Hamburg Messe system to be used for both background music and informational announcements.

SIX STEPS TO GREATER RESOURCE EFFICIENCY



Startup workshop
Development of a common objective



Analysis
Development of an efficiency concept



Planning
Ensuring feasibility



Realization
Implementation of the efficiency concept



Operation
Maintenance of the energy systems



Continuous improvement
Development of further optimization potential



Increased Profitability Through Digitalization in the Production Process

Connected solutions contribute significantly to increasing resource efficiency in manufacturing companies – and people, machines, and data are the three pillars of success.

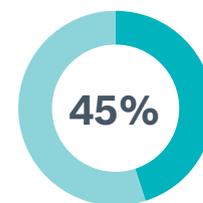
In the factory of the future, people, machines, and data will hold the key to success. Intelligent software solutions ensure the interlinking of machines, products, and existing IT systems. More and more companies are now using applications from the Industry 4.0 sector to optimize their processes, increase productivity, and enhance competitiveness. At the same time, digitalization can also make a significant contribution to improving resource efficiency. Increasing productivity with improved profitability decisively strengthens a company's position in the competitive environment.

On average, materials and energy are responsible for around 45 percent of product production costs in manufacturing companies. Efficient use of resources is therefore a critical factor in competitiveness,

because cost reduction has a direct impact on profitability.

This is where Bosch Energy and Building Solutions' multistage concept comes in: data collection in production, design of a customized bundle of measures, implementation of the identified efficiency measures, and monitoring of energy systems to ensure sustainable improvements in efficiency as well as any further optimization potential. Interdisciplinary teams of industry experts and engineers work closely with those in charge at the companies.

In order to tap into this potential, a comprehensive analysis of the use of resources in production along the value stream is required. During a Gemba walk, the experts gain insight into the customer's production processes and requirements. The knowledge thus gained helps ↻



Materials and energy account for 45 percent of production costs at manufacturing companies.

them develop a common objective. Bosch's methodology specializes in taking a holistic view of energy and resource use and of production processes. There are often interactions at work that can only be identified by a combined analysis of the energy infrastructure and production processes. Bosch and its teams then unlock the resulting potential for optimization. In this way, customers benefit from the experience and expertise to be found in every area.

The improvement process does not end with implementation of efficiency measures. On request, digital software systems such as the Energy Platform are introduced to monitor energy flows in production and ensure sustainability. "To calculate key figures in real time and perform analyses, it is essential to use data from production processes and interlink them with data from other sources," explains Sven Sautter, head of Energy Services at Bosch Energy and Building Solutions. Once data access has been established, this information can be used for other applications – for instance, to increase production reliability or to optimize maintenance management. Two practical examples illustrate the interactions of individual measures with respect to the overall result.

SMART UP YOUR FACTORY: OLD MACHINERY GOES DIGITAL

When it comes to terms such as Industry 4.0 and digitalization, many employees are sometimes cautious. "And yet employees are the pivotal point here. That's why it's important that they be included when changes occur," says Fabian Pieper, Senior

Sales Manager Efficiency Solutions. In order to help medium-sized companies move forward in the digital world and increase resource efficiency, Bosch offers a weeklong hackathon as part of the Smart Up Your Factory project: employees from different areas meet up and participate in an intensive exchange of ideas about challenges in day-to-day operations. Together, they identify ways of reducing the consumption of resources, and quickly and iteratively prepare any potential found for use in a pilot project. If their expectations are met, this leads to a production rollout.

All of this is based on visualization of process-relevant data, which Bosch experts record with sensors on the machines. This creates transparency, highlights flaws, and provides information about potential. "Vibrations, for example, enable me to anticipate when a machine part needs to be replaced. That way, maintenance can be optimized," Pieper explains. "Every machine, no matter how old, can be brought into the digital age. The foundation is the know-how of the employees, who take an active role in improving their machine."

LEAN MANAGEMENT + INDUSTRY 4.0

Another practical example provides impressive results: as part of the EffCheck promotional project to improve production-integrated environmental protection, Bosch experts took a close look at the cleaning program for die-cast parts in a medium-sized company. Here, high-speed processing machines produce complex components with the high-



EFFICIENCY PARTNERSHIP

Within the scope of an efficiency partnership, our experts continuously identify efficiency potential, taking into account the various reciprocal effects. Bosch assumes responsibility for overall project management in order to leverage this potential. Periodic reporting ensures optimum transparency in terms of the efficiency measures' success.



Bosch is already using the Energy Platform to monitor the efficiency of production in more than 100 plants worldwide.

est quality requirements. Before the individual components can be joined together in an assembly, they have to be put through washing systems to be cleaned of cooling lubricants and chips. Up to now, there has been only one washing program designed for the parts, entailing the highest commitment of resources: this program is used for all products, regardless of size and shape. “As part of the EffCheck, we have found a solution for reducing the use of resources by means of individualized cleaning programs,” says Jan Westermeyer of Bosch Energy and Building Solutions.

The first step for the specialists from Bosch was to assess the current situation. The die-cast parts produced in the machining centers

are automatically placed in washing baskets and then cleaned in the washing system with water heated to 80 degrees Celsius. “To do this, the company was using a lot of electrical energy, thermal energy, cleaning agents, and water because the different parts were being treated alike,” says Westermeyer. The analysis showed that the washing systems are technically capable of running different programs. Only 60 percent of their capacity was being used, but the water still had to be kept constantly heated.

The solution is based partly on lean management, but also on the opportunities presented by Industry 4.0. At the suggestion of Bosch experts, not only are the cleaning programs now individualized, but the washing baskets are also fitted with RFID tags. This is where the processing machine stores the component variant; an RFID gate at the wash system reads this information and starts the respective program. This automated process increases efficiency and reduces resource consumption and standby times. ●

When Digitalization Shows Us the Way

Data becomes information, information becomes knowledge, and new knowledge allows new actions: if all data of a building and the underlying building services systems are harmonized, users, operators, and the environment ultimately benefit. The digital building twin from Bosch shows how this can be achieved.

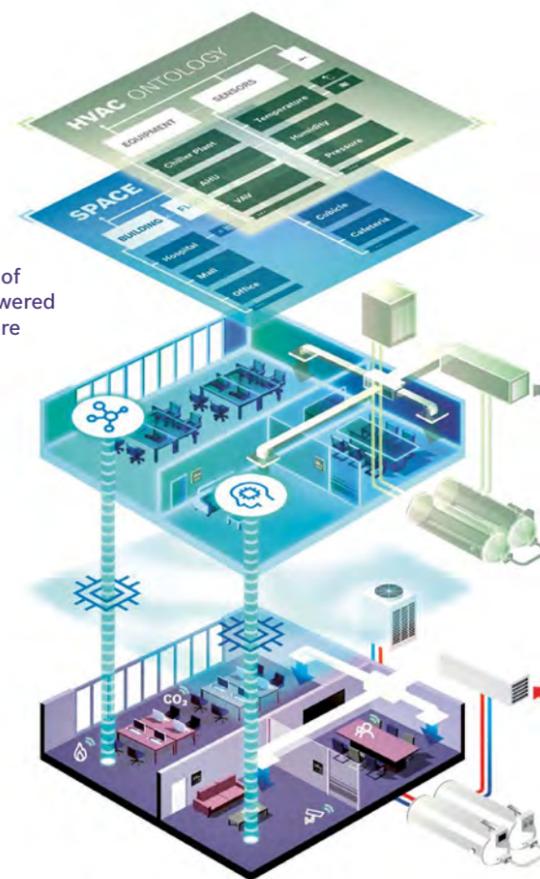
You have an important appointment at 10 a.m., and the way there turns into an odyssey. Who hasn't been in that situation? Lack of local knowledge, no one nearby to ask, no signs to show the way. And then you end up being ten minutes late. There are plenty of occurrences of this in daily life. The meeting with your boss in the new factory building, the search for gate 52 in terminal three at the airport, an important customer meeting at trade fair booth 05.127. A simple, digital indoor nav-

igation system could provide a solution. A service based on different data that has been collated and merged. In a digital building twin.

This "digital twin" is an addition to the options offered by building management. In the future, the twin will initially make it possible to create a virtual image of the physical building, including the necessary building technology with its systems, devices, sensors, and actuators. On the basis of this cohesive image, the data packets of individual components can be connected with each other and new services can be implemented. The services can be useful both for creating new business models and for practical everyday help.

The data required for the services originates from sources such as sensors and systems with building, lighting, and energy management as well as security technology. Up to now, they are often not used together, because in reality all systems, especially in existing buildings, often run independently next to each other and are rarely integrated. Today's options offered by cloud gateways and IoT technologies open up opportunities for smart services by combining existing data. If, in addition, one uses ontology to enrich data into real information, one finally attains semantic data homogenization. In addition to its own domain-specific ontologies,

Semantic model of a digital twin powered by Microsoft Azure Cloud Services



Bosch also makes use of its partners and other market players' knowledge. These ontologies are made publicly available, because the greater the semantic understanding of buildings becomes, the greater the benefit to the real estate industry.

The enrichment of different data with information from the digital building twin and the resulting ability to demonstrate meaningful semantic relationships transforms the raw numerical material of the different components into valuable insights for users.

In principle, it's just like modern navigation in cars: we used to look up our route in an atlas, work out the estimated journey time with a pocket calculator, and listen to the radio to hear about traffic jams ahead. Today, all this information has been digitalized and consolidated in the navigation system. The system can forecast our arrival time and suggest alternative routes. What's more, we can not only navigate by addresses and places, but also search for the next medium-priced Italian restaurant with

a 4.5-star rating or simply look for a popular pizza franchise along our route with a maximum detour of five minutes. Who would now want to go without this service?

These are exactly the kind of practical services that the digital building twin enables for buildings. For example, by exchanging different data, a maintenance company will in the future be able to predict exactly which component of a ventilation system has already been in use, when and for how long, whether it will behave as expected, or whether, for example, the filter needs to be replaced. On this basis, technicians' visits can be optimally planned and the necessary spare parts can be ordered automatically 14 days before the visit. In addition, information on the frequency and duration of use of spaces provides just as many tangible parameters for increasing efficiency as the average temperature control in individual rooms. Property and facility management also benefits from the consolidation of data from different systems – this creates detailed knowledge about the use of space in the building and thus solutions for space management.

Digitalization also brings benefits to the users of buildings. For example, when an employee passes through the turnstile of his or her workplace's entrance area in the morning, the office heating is automatically regulated to the desired comfortable temperature. Or when, as a visitor in an unfamiliar building, you are conveniently and easily guided from the underground parking garage to the right meeting room.

We have only just started exploiting this potential. This is because the number of data-producing components and data-consuming applications is constantly increasing. To take advantage of this, the digital building twin is the ideal way to create the necessary transparency. With its many years of experience as a system integrator and its know-how in the field of IoT, Bosch offers the best basis for seizing this potential and creating new services with added value.

Digital HR Processes Also Benefit Medium-Sized Companies

Personnel schedules, vacations, and absences as well as time management are all handled digitally at Wilhelm Bähren GmbH & Co. KG, a medium-sized enterprise in the printing sector. The company would not want to do without its workforce management solution planned and integrated by Bosch.

With somewhat more than 200 employees, individual printing solutions, and a clear priority on efficient processes, the management at Bähren Druck is convinced that medium-sized enterprises also need to optimize, automate, and digitalize their processes. "We as top managers have always been very IT-oriented," reports HR head Daniel Finke. So a software solution was sure to replace the age of paper for the company's HR department. "We now have a modern and flexible personnel management system that generates added value and saves time for managers and employees alike," says Finke, adding that this type of investment pays off for medium-sized companies and that the benefits of digitalization are clear.

Time management, vacation planning, absence management, and scheduling are all integrated into the company's workforce management solution. In order for processes to run efficiently and for all employees to be involved, Bähren Druck installed self-service terminals at its sites, which enable

The Bähren printing company: Superb experience with digital HR management

even production workers to make optimal use of the functions. Absences from work such as training, illness, and parental leave are entered into the system, and employees use the system themselves to correct for them. The ability to manage presence and absence is of great help in ensuring that payrolls are correct at the end of the month.

Vacation request forms are a thing of the past at Bähren Druck. Employees enter their desired vacation dates into the system. Their bosses are informed by e-mail, and can either approve the dates with a few clicks or modify them with the employees via the system. This eliminates lengthy planning work, and frees both bosses and the HR department from "tedious manual processes," as Finke puts it.

Since linking its site access system to the workforce solution, Bähren Druck has made a quantum leap

in quality and security. Because 98 percent of its customers come from the pharmaceutical industry, the company wanted to consolidate different types of access authorization in one place. Bähren Druck now uses the workforce management solution to control and document all employee access at three sites. As Finke reports, "It works perfectly and is very convenient."

This HR solution also takes into account the different types of pay for multiple-shift operation in the print industry. Data are transferred electronically to the external service provider. Employees now receive more comprehensive pay slips, and can also be sure that they are compensated fairly with no minute lost. As Finke explains, "The pay slips build confidence, and the employees like the transparency." Temporary workers from personnel agencies are included in Bähren Druck's system with specific features. Their time sheets are automatically entered into the software, and digital summaries are sent to the agencies as the basis for their accounts. This is another way the system saves time for Bähren Druck, according to Finke. Precise data also lay the foundation for efficient personnel planning. That is now the job of the shift heads, which frees up the HR department. The shift

heads do their planning conveniently with a few mouse clicks in the system, and are notified of any deviations from their plans. Notification functions of this type are expected to undergo further expansion with the aim of systematically informing HR specialists and managers of both results and tasks. The next step will be for Bosch and Bähren Druck to incorporate employee qualification levels into the system as well. Taking employee skills into account will make personnel planning yet more precise and efficient.



HR head Daniel Finke: More time for important tasks

At Bosch, ideas and implementation go hand in hand. Daniel Finke noted of his own accord that he "has never felt the need" to look for a new service provider for workforce management. "Bosch is a pleasant, expert, and dependable partner for us."



Protection Against Cyberattacks and IT Threats

Cybercrime is no respecter of building security systems. Today's physical security systems are increasingly IP-based and are operated more and more often in the same networks as generic IT office and production IT systems. To meet the growing requirements of information security, Bosch in Germany is offering new services to protect against cyberattacks and other IT threats.

The further the digitalization of the economy progresses, the stronger the need for information security grows. In order to be able to produce more efficiently and more flexibly, companies are increasingly connecting their machines and processes – all with an eye to Industry 4.0. The companies' buildings themselves are getting smarter too: components such as heating, ventilation, lighting, gates, doors, windows, and elevators are often integrated into a connected overall system in order to centrally monitor and control energy consumption and security. This means that the number of Internet-ready devices increases exponentially. All industries already produce a great deal of data about the sensors and building technology systems installed, and this data

needs to be protected – especially from hackers.

"IT security is the decisive factor for many companies when it comes to how far they venture into the digital future," says André Heuer, who is responsible for information security at Bosch Energy and Building Solutions. This is a challenge that more and more managers need to face up to. According to a study by the Bitkom digital association, the number of cyberattacks has increased in the last two years for a good eight out of ten industrial companies (84 percent), and, for more than a third of them (37 percent), it has even been a sharp increase. It's no wonder that for many companies security is even more important than the development of innovations. In the 2018 trend study *Unterwegs zu digitalen Welten*

("Towards Digital Worlds") conducted by Bitkom Research, 62 percent of the companies surveyed said they would invest in IT security solutions – 10 percent more than would invest in data analysis tools.

NEW LEGAL FRAMEWORK

Germany's IT Security Act, which came into force in 2015, addresses those areas where a modern society can least afford failures: critical infrastructure. Industries such as energy, IT and telecommunications, transportation and traffic, health, water, food, and finance and insurance are obliged to adequately secure their IT and to review this protection at least every two years. This first IT security law is to be further developed and intensified before the end of this year.

"Even though sectors connected to critical infrastructure have to pay particular attention to information security, the issue is in fact relevant to every company," Heuer stresses. This is why VdS, Europe's largest institute for loss prevention, has developed the guideline "VdS-certified cybersecurity" (VdS 3473) for small and medium-sized companies. Certified cybersecurity generates trust with customers and suppliers and produces competitive advantages. At Bosch, we are convinced that medium-sized companies not only need their own guidelines, but also advice and services that are specially tailored to their needs. "In contrast to large corporations, small and medium-sized companies rarely have proven experts for information security in-house and are dependent on external know-how," says Heuer.

GOAL: CONFIDENTIALITY, AVAILABILITY, AND INTEGRITY

Bosch offers businesses products such as fire alarm systems, hold-up and intrusion alarm systems, electro-acoustic systems, video systems, and systems for time and access control. The Information Security Team (InfoSec) takes care of another security aspect: information security itself. Heuer's team ensures that information and IT systems remain confidential, available and of integrity, and helps clients to comply with the relevant standards and laws. This applies to the entire security infrastructure: in modern buildings, individual safety solutions are not placed independently beside one another; they are connected together. Protecting this overall system is just as important as protecting the individual solutions.



A current customer example is an illustration of how a typical InfoSec project looks: a critical-infrastructure company that operates one of the largest gas transmission networks in Germany has migrated its entire system, known as its Building Integration System (BIS), to a new IT landscape. One important prerequisite was that the new system had to be able to fulfill all requirements found in the German Federal Network Agency's (Bundesnetzagentur, BNetzA) IT security catalog. "The example shows that both skills – for building security and for information security – go hand in hand nowadays. Bosch was awarded the contract because we can cover both in equal measure," says Heuer.

FROM CONSULTANCY TO OPERATION

For projects of this kind, the InfoSec team proceeds in three steps. Information security consultancy is the be-all and end-all. This is where Bosch listens to the customer's requirements, identifies and evaluates the risks, and draws up an information security concept for the customer. In the second step, the security operations center, Bosch ensures that the customer solution will work during ongoing operations. To this end, the experts check at predefined intervals whether new vulnerabilities have become known for the customer solution (vulnerability management) and inform the customer about IT-relevant incidents such as hacker attacks or computer outages (incident management). Whether there is a weakness or an incident, Bosch evaluates the risk in question and suggests countermeasures. The range of these measures may extend from firewall settings and the optimization of virus protection to system hardening. During system hardening, all non-relevant services in the system are deactivated and access authorizations that are not relevant for operation are also restricted. ●



André Heuer, Head of Information Security at Bosch Energy and Building Solutions

NEW SECURITY SOLUTION

Shop and Surf Safely

IN 2018, the new sports shop of Lengermann & Trieschmann, one of the largest fashion stores in northern Germany, had its grand opening. Besides the 5,000 square meters of retail space, there is also a real attraction: the "Hasewelle" ("rabbit wave") – a stationary wave that allows indoor surfing in the middle of Osnabrück. Regardless of the temperature outside and the swell of the waves, both young and old find perfect surf conditions. A history of collaboration connects Lengermann & Trieschmann and Bosch, including the security solution realized in the fashion store. Here, different facilities such as restaurants and bars are located on 20,000 square meters.

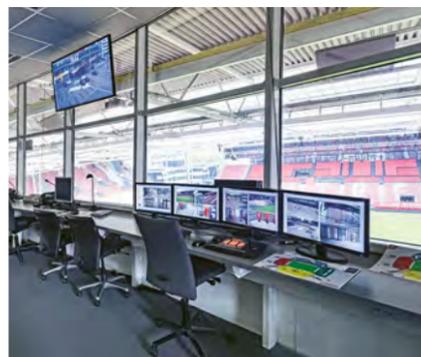


The new sports shop required a clever integration into this concept. Bosch experts developed a comprehensive solution combining fire protection, access, evacuation, and video surveillance. Visitors can look forward to safe shopping and surfing.

IDENTIFICATION IN REAL TIME

Razor-Sharp

THE GALGENWAARD STADIUM, home to the FC Utrecht soccer club, is one of the largest stadiums in the Netherlands, with more than 23,000 seats. But the existing video surveil-



lance system was no match for troublemakers and hooligans. Investment in more effective security measures had to be made quickly. In just two months, the team from Bosch Energy and Building Solutions in the Netherlands planned and implemented an innovative and reliable IP video surveillance system, with 61 cameras in full HD and ultra HD quality. The high quality of the footage ensures real-time identification of visitors. Incidents are now detected directly, enabling security personnel to react faster and more effectively. The new camera system ensures much more effective crowd control at the entrance and exit.



PUBLISHER INFORMATION

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Publisher

Bosch Sicherheitssysteme GmbH
Energy and Building Solutions
Robert-Bosch-Ring 5
85630 Grasbrunn, Germany
Phone: (0800) 700 04 44
E-mail: buildingsolutions@bosch.com
www.boschbuildingsolutions.com

Under the responsibility of
Muriel Mitschele (BT-IE/MKT)

Project management

Tina Kumpf
Tina.kumpf@de.bosch.com

Contributors to this issue:

Erika Goerge, Matthias Herold,
Judith Kiermasch, Thomas Lutsch,
Habib Modabber, Courtney
Moolenaar, Tushara Nair,
and Ellen Niediek

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Stuttgart, Germany

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BEYOND THE NORM

It's All About People

Where do our associates get their enthusiasm, and how do they generate enthusiasm in our customers? Our series of interviews gives you some insights, and these quotes provide a brief overview.

All the interviews can be found at:
www.boschbuildingsolutions.com/people



"What our customers love is our high level of reliability! They never have to deal with a problem or breakdown alone. In my work as a service technician I'm flexible, easily available, and provide solution-oriented assistance."

Daniel Di Bartolomeo,
Service Technician in Germany

"I'm thrilled by the sheer unlimited number of possibilities that solutions from Bosch offer to a sector as exciting as airports! We can delight our customers with connected solutions that support airports in their digital transformation, increase safety and efficiency, and offer new experiences to air travelers."



Freek Vermeulen,
Customer Program Manager
Airports in the Netherlands



"Empathy is what my customers really like, and how I respond to their challenges and needs. They realize I'm not just hearing what they say but also actively listening to them."

Kelvin Cheong,
Project Director Security and
Life Safety in Singapore

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