

ENERGY AND BUILDING

SOLUTIONS

2025

A Magazine About Security, Comfort and Efficiency in Commercial Buildings

**Perfect climate
for abstract works
of art**

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Cluster**

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Technik fürs Leben



BOSCH



Dear readers,

Our founder Robert Bosch had a clear idea of what values his company should stand for. From day one, credibility, reliability, quality and trust have formed the solid foundation of our long-lasting partnerships with our customers. Based on these basic principles, our team develops and implements connected and integrated solutions for you in the areas of life safety and security, building automation and energy efficiency, and offers you an exceptional service. At the same time, these values are an important compass for us when using the latest building technologies and evaluating data with the help of artificial intelligence.

As one of the world's leading system integrators for building technology, we are forever focused on people's needs, leading the way in digitalization and designing new services with added value to make your properties and infrastructures even safer, more efficient, more comfortable and more sustainable. With us, you can always look forward to new opportunities – the future is exciting.

I hope you enjoy reading this issue.

Thomas Quante
CEO Bosch Building Technologies

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Spotlight on innovative fire protection

The striking 1,000-square-meter LED ceiling at Printworks is a work of art measuring 115 meters long and 40 meters high. The 150-year-old former newspaper building in Manchester is now an entertainment center. Where daily newspapers were once produced, people now shop over 34,000 square meters of space, play sports, visit one of the numerous bars and, most recently, admire the impressive ceiling on which 3D animations or artistic color collages are shown. To create this remarkable ceiling, operators relied on the inventiveness of Bosch subsidiary Protec UK, which has been responsible for the fire protection solution at Printworks for more than 15 years. New aspirating smoke detectors were installed above the screens and special flame detectors below. The control units for the fire-extinguishing systems were installed 40 meters above the floor and the extinguishing nozzles at a lower level below the screens. Self-learning algorithms analyze the area for smoke particles. If the smoke concentration exceeds the defined threshold, a second detector must confirm the alarm before the security team in the control room is informed. If the alarm is not deactivated, the system triggers the sprinkler system after three minutes.

Shining Example



Learn more about the solution.



A-ROSA Hotel Travemünde

Relaxing in safety

Relaxing on the Baltic Sea and enjoying the peace and quiet – Hotel A-ROSA Travemünde on the Bay of Lübeck offers its guests not only a great deal of comfort, but also the opportunity to spend their vacation in a setting with maximum safety. To this end, Bosch Energy and Building Solutions equipped the listed building, which dates back to 1911 and was extended in 2005, with state-of-the-art fire protection technology that prevents false alarms. In just two weeks and during ongoing operations, 1,084 fire detectors with integrat-

ed multi-sensors were installed in the 194 rooms and in the 4,500 square meter wellness area, in addition to two Avenar 8000 Premium fire alarm system panels. The fire detectors have combined optical and thermal sensors, as well as an additional special sensor for the rapid detection of carbon monoxide. The detectors are only triggered when both smoke and an increase in temperature or CO concentration are detected. This ensures a pleasurable, undisturbed vacation in an oasis of tranquility.

Park smart, save time



A major car manufacturer has opted for a smart solution from Bosch Energy and Building Solutions enabling employees to quickly and easily find a free space in one of the company's 6,000 parking spaces. A brief look at the company's internal smartphone app is all it takes to display and drive to an available parking space. This saves employees a lot of time, especially during the morning rush hour. To make sure the information is available in real time via the app and displays on site, the entrances and exits of selected parking areas on the car manufacturer's site are evaluated through the intelligent analysis of video images in compliance with data protection regulations.

Time saved

New functions in the NEXOSPACE Fire System Analyzer

Customers of the digital service NEXOSPACE Fire System Analyzer can now use the digital operating log to document incidents requiring documentation in their fire alarm systems more securely, quickly and completely. According to DIN 14675 and VDE 0833-1/2, every operator of a fire alarm system is obliged to keep an operating log in which all relevant incidents relating to the building's fire alarm system are recorded. The digital operating log of the NEXOSPACE Fire System Analyzer service automatically records and documents these incidents. Compared to the previously used paper operating log, this reduces the time required and the error rate, for example due to forgotten or illegible entries. Manual additions are still

possible, but are no longer necessary. Customer data is managed and maintained in the digital operating log via a secure cloud infrastructure.

Another new feature of the NEXOSPACE Fire System Analyzer is the displaying of digital fire department route maps, which provide a schematic illustration of the building. They enable quick orientation in the event of an incident. By linking the fire department route maps directly to the respective event, the facility manager can, for example, identify where the zone is located in the building with a single click in the event of an incident. This saves time as the affected detector can be checked immediately to implement measures.



Discover more.

Perfect climate for great art

The building automation team at Bosch Energy and Building Solutions implemented a high-level solution at Museum Reinhard Ernst.

Optimum climate control plays a key role in protecting the unique abstract works of art at Museum Reinhard Ernst (mre) from damage caused by external influences. The cube-shaped white building, designed by Pritzker Prize winner Fumihiko Maki, houses a total area of 9,700 m², including 2,500 m² of extensive exhibition space and an art depot. The premises are equipped with over 600 virtually invisible sensors and actuators that measure and monitor temperature, humidity and CO₂ levels. The permitted tolerances are negligible, and the automation system reacts immediately and proactively to any disruptive influences, balancing them out. The Bosch team ensured high reliability of operation, particularly with regard to constant room conditions, through

extensive programming of the automation equipment. The intelligent solution automatically detects when the sensors are not working properly and bridges the time until the cause is rectified by immediately switching to the nearest measurement technology. The automation system acts in a similar way in the event of malfunctions in the air conditioning technology or the energy generators.

The team at Bosch has developed and implemented predictive automation strategies for most conceivable critical scenarios in the museum. If necessary, the mre operations team receives rapid support from Bosch experts who can access the systems remotely.



Learn more about the solution.



“Customers need an experienced partner with long-term perspectives.”

Together for a better life

Dr. Frank Meyer, member of the Board of Management, Robert Bosch GmbH

Dr. Meyer, as a member of the Bosch Board of Management, you are responsible for the Energy and Building Technology business sector and therefore also for our division. What inspires you about Bosch Building Technologies?

I think it's great how the Bosch Building Technologies team is contributing to a better life and to the environment with innovative technologies, solutions and services – living up to our slogan “Invented for life”. And I imagine that readers have already come across the solutions many times. When you are passing through Schiphol Airport in the Netherlands, for example, you will come across state-of-the-art video security solutions from Bosch Building Technologies. The same goes for a visit to the legendary Hockenheimring race track. If you travel across London on the Elizabeth Line, it features our solutions for fire protection and evacuation. The spectacular skyscraper “The

Spiral” in New York is equipped with a smart building automation solution. And thanks to our expertise, you can also enjoy a concert in the Elbphilharmonie which features optimum climate control. I could list many other examples of how Bosch Building Technologies, as a system integrator, ensures greater security, comfortable environments and efficient operations more or less behind the scenes in a wide variety of commercial buildings and infrastructures. Through projects such as these, the team is also making an important contribution to climate protection.

Can you explain the last point in more detail?

The building sector accounts for a significant proportion of global greenhouse gas emissions at around 40 percent*. To reduce this level, greater energy efficiency is a top priority. For the commercial sector, Bosch Building Technologies de-

velops solutions that reduce energy consumption and enable properties to be operated in a way that saves costs and resources. Building automation plays an essential role here. It is an important growth area for us on both sides of the Atlantic, which we were able to further strengthen last year by acquiring two companies with many years of expertise. →

About the Person

Dr. Frank Meyer has been a member of the Board of Management of Robert Bosch GmbH since February 1, 2024. He is responsible for the Energy and Building Technology business sector with the affiliated divisions Building Technologies, Home Comfort Group, and the subsidiary Smart Home.

*Source: European Union

Which companies are we talking about?

With DMS AG, we have acquired a specialist company whose expertise in industrial and process automation completes the Bosch Building Technologies portfolio for industrial customers in Germany. The business of Climatec, our subsidiary for building solutions in the USA, was expanded through the acquisition of Engineered Control Solutions, Inc. ECS is a leading provider of building automation and system integration in North and South Carolina. The market offers excellent growth opportunities.

How important is it for customers to have a system integrator like Bosch Building Technologies that supports them as a long-term partner with solutions and services?

This is more important than ever, as shown by the increasing demand for integrated end-to-end solutions. Mega topics such as climate protection, security and digitalization are changing the demands on commercial buildings and infrastructures. At the same time, they have to be operated economically. This presents owners and operators with complex challenges. Today, not only can many requirements be solved, but also permanently improved with the help of networked solutions and the intelligent use of data from building technology. To do this, customers need an experienced partner with a long-term perspective who not only has expertise in safety, security, building automation and energy efficiency, but also a high level of technological expertise in the areas of IoT, connectivity and artificial intelligence.

Are these technologies the key to optimal control of commercial buildings?

In fact, it is the combination of hardware, software, sensors, systems and, increasingly, AI that can significantly increase the performance of buildings. One example from building security is the AVIOTEC video-based early fire detection system from Bosch Building Technologies. Using image recognition algorithms, this camera continuously analyzes its surroundings and can detect potential fire sources based on visual signals in just a few seconds. The camera could also be used for counting people, for instance. Another example is the cloud-based IoT services from the NEXOSPACE Service Suite, which are used to automate and optimize processes based on data analysis. Whether this is the maintenance of fire alarm systems or the management of energy consumption. Thanks to AI, it will be possible to better understand events in this context and

even predict them in the future so that measures can be taken in advance.

What other message would you like to pass on to the many customers of Bosch Building Technologies?

Protecting people, assets and the environment are important tasks for which we have innovative solutions that are "Invented for life". Sustainability is particularly important to me personally, not least because I have two children. Advocating climate protection has been part of my career for a long time and was also one of the reasons why I joined Bosch. The climate targets can only be achieved by joining forces. This requires innovative technological solutions and a partner like Bosch Building Technologies with its highly motivated team.

At the headquarters of Bosch subsidiary Protec UK, Frank Meyer, Neil Harling, Alistair Brennan (L to R).



Eagle's view

Drone service for rescue teams and industry

The control center-connected drone service from Bosch Energy and Building Solutions has recently boosted the security landscape. With live video from the air, emergency response teams and security officers benefit from a new level of foresight.

The service offers 24/7 availability of drones at the customer's location, with the drones themselves ready for use in 30 seconds, traveling at speeds of up to 150 km/h. They are controlled by trained Bosch pilots and the service is integrated into existing control center systems. The real-time videos provide rescue teams with significant information in the event of fires, natural disasters, accidents or search operations, saving them valuable time. And exploratory flights with a drone only cost a fraction of the cost of deploying a helicopter. The BVLOS (beyond visual line of

sight) flight, which does not require visual contact with the drone and can cover a radius of up to 250 km, is also attractive for industrial customers who need to monitor large sites or properties.

The service relies on high security standards for data transmission and is SAIL III certified, which allows the drone to fly over populated areas, for example. The drones are maintained on site by the Bosch service team without long downtimes.



Digital first

The BABOR BEAUTY GROUP is setting new standards with its new production and logistics cluster. Production of the high-end cosmetics was relocated to Eschweiler, 20 km from the Aachen headquarters. “We have built one of the most sustainable cosmetics factories in the world here. This claim runs through all our projects. To do this, we need partners who share our values. Bosch Energy and Building Solutions is an ideal partner for us,” says Dirk Leßmann, Vice President Operations of the BABOR BEAUTY GROUP. All buildings meet the KfW 40 energy efficiency standard, the roof of the production hall is covered in greenery and, of course, a photovoltaic system generates some of the electricity. But that’s not all: throughout the site are digital processes that maximize operational efficiency. The fully networked end-to-end solution from Bosch Energy and Building Solutions for safety, security and building management also plays a part in this. The cosmetics company has enjoyed a future-focused relationship with Bosch Energy and Building Solutions for almost two decades. Thanks to the building experts’ digitalization expertise, it has deployed innovative solutions in the past. At the cosmetics manufacturer’s new site, the experts once again demonstrate what cleverly designed solutions equipped with best-of-breed technologies can look like. ➔

Perfectly connected – the tailored solution for the BABOR Beauty Cluster

Successful collaboration:
Reinhold Stenten, responsible for
Engineering and Facility Management
at BABOR BEAUTY GROUP, Sales
Manager Janina Adolph from Bosch
Energy and Building Solutions, Dirk
Leßmann, Vice President Operations at
BABOR BEAUTY GROUP, and Uwe B.
Herrmann, Sales Manager at Bosch
Energy and Building Solutions (L to R).



- 1 The automated parking lot management system with license plate recognition provides greater comfort.
- 2 The smart solution includes video security to protect the company premises, for example.
- 3 Every day, the company fills half a million jars, tubes and ampoules, and manages logistics and shipping to 70 countries.

Proven partnership delivers innovative solutions

The BABOR BEAUTY GROUP was founded in 1956 and is one of the largest cosmetics companies in the world and home to some of the most sought-after international beauty brands “Made in Germany”. For the family-owned company, sustainability also means long-term and trusting collaboration with partners like Bosch. “We started with small projects. As we grew, our buildings got bigger and so did the tasks for Bosch,” recalls Reinhold Stenten, responsible for engineering and facility management at the BABOR BEAUTY GROUP. When “The Curve” building was erected at the headquarters in Aachen in 2019, the Bosch team developed and implemented a smart solution with innovative features that is scalable for future expansions. The new BABOR Beauty Cluster production and logistics building, which opened in summer 2023, is now used to fill cosmetic products on up to 50 filling and picking lines. It is also home to a distribution center, which is served by freight forwarders. The products are sent from Eschweiler to 70 countries, with most of the production taking place in the Aachen region. Innovation, production and quality assurance are provided from a single source. “Production is our DNA. Having this in-house is essential for us as a family business with roots in the region,” explains Dirk Leßmann.

Building and security technology at both locations in one management system

“The manufacturing of cosmetic products is subject to strict regulations. We have to make sure that no one gains unauthorized access to our buildings. For us, security means protecting values and our reputation,” emphasizes Site Manager Dirk Leßmann. To support the BABOR Beauty Cluster, the Bosch team designed and implemented numerous innovations including fire and intrusion detection systems, digital access controls with a system for issuing ID cards and a video security



The BABOR BEAUTY GROUP's production and logistics site opened in 2023 and is almost entirely digitalized.

system for the company premises including perimeter protection. The visitor management system with self-service function and a parking lot management system with license plate recognition were also part of the tailored solution. The latter is particularly important for the efficient operation of the logistics hub, as it is used to control truck access via an on-demand control system and avoid unnecessary traffic on the premises. Video technology is also used to keep an eye on cargo security. “Thanks to Bosch's digitalization expertise, we were able to link together our safety and security systems at the Eschweiler and Aachen sites. This increases transparency, gives us in the operations team a better overview and makes our work easier,” explains Reinhold Stenten. After all, with the 60,000 square meters in Eschweiler, the BABOR BEAUTY GROUP has tripled the space of the company. Uwe B. Herrmann, Sales Manager at Bosch Energy and Building Solutions and Project Manager for the BABOR BEAUTY GROUP for many years, adds: “We have connected all parts of the building and the solutions together so that the information from the building and security technology, whether in Aachen or in Eschweiler, converges in our BIS 360 Building Integration System. This way, the operations team can monitor and control both locations from one workstation”.

The Bosch team – an experienced companion

With foresight, the basis for a cross-location concept was already laid during the work on “The Curve” headquarters, therefore the technologies and systems between the headquarters and the new site are networked via a shared infrastructure. The work of the operations team is simplified by artificial intelligence, which is used in the video solution at both locations and analyzes objects in the images in advance. “We were also able to create a standardized concept for alerting and intervention across all locations,” continues Uwe B. Herrmann. The BABOR BEAUTY GROUP values the anticipatory approach of Bosch's building experts: “We can do cosmetics – but we aren't experts in building or security technology. That's why our collaboration is based on a partnership with a clear division of roles. I know that the experts will give me sound advice, that the solutions will suit our company and that they'll be of outstanding quality,” says Dirk Leßmann. As part of an operator model, the Bosch team will take care of the reliable operation of the overall solution for the next ten years.



Discover our solutions for advanced building security.



Deep dive needed

What the KRITIS legislation means for affected companies

Although the adoption of the national KRITIS Act to strengthen the physical resilience of critical facilities has been delayed, the regulation stipulated by the EU must be promptly transposed into national law. For operators of critical infrastructures, this means delving deeper into their existing security concepts. The aim of the legislation is to ensure comprehensive protection of facilities that are essential for public supply and security. Besides IT security, it also focuses on risks from natural and man-made hazards. Up to 30,000 companies in the energy supply, transport and traffic, finance and insurance, healthcare, water supply, municipal waste disposal, nutrition, space research, IT and telecommunications sectors are affected. Federal administration facilities are also included. Operators of these companies are required to establish a structured risk management system, develop crisis management processes and comply with reporting obligations in the event of

security incidents. In addition, technical and organizational measures must be taken to make sure systems are physically protected. The implementation of these requirements necessitates careful planning and integration of suitable security solutions. A holistic approach is essential to meet the new demands and to increase the resilience of the infrastructure. The legislation also tightens sanctions for non-compliance and introduces audits and inspections by authorities. There is often uncertainty within companies that are new to the KRITIS sectors. A lack of resources and the complexity of the new rules are challenging. "Through our expertise we support the assessment of existing technical facilities. We also advise on the product-agnostic selection of video security systems, access and entry control systems and components for securing the property perimeters, for example," explains Felix Weidinger, KRITIS expert at Bosch Energy and Building Solutions.

Advantages in sight

The standardization of measures creates uniform requirements throughout Europe, which levels the playing field and offers companies planning security. Companies must act proactively. An inventory of existing security measures, followed by the prioritization of vulnerabilities, forms the basis for an ongoing improvement process. By collaborating with experienced partners such as Bosch Energy and Building Solutions, tailored solutions can be developed and requirements implemented efficiently. In addition, companies receive support in the migration and operation of their security systems. One particular source of added value is the proactive operational support that Bosch provides KRITIS companies quickly and efficiently, either remotely or through its nationwide service organization.

Data as a game changer for greater efficiency

North America's largest provider of student housing relies on the expertise of Bosch subsidiary Climatec.



American Campus Communities (ACC) is the market leader for private student housing in the USA, with over 160 residences and more than 140,000 beds. Bosch subsidiary Climatec supports ACC in optimizing the energy consumption of its properties in order to increase energy efficiency and lower operating costs. New ACC facilities residences are already certified as eco-friendly by the international LEED program, which has led to modernizing 25 existing buildings to improve energy efficiency in recent

years. Climatec uses IoT software that merges the 12 different installed building automation solutions into a central management platform in the cloud – giving ACC's central facility management team access to all systems. The software collects, analyzes and visualizes data points relating to energy, water and heating consumption. These data points were used to develop an overarching standard that can be applied to the entire building portfolio. The system detects deviations in consumption, such as leaks in the water system, and reports them automatically to allow technicians to take targeted and prompt action. Centralized access also enables efficient control of the systems and reduces the need for on-site personnel. In the future, real-time analyses and intelligent algorithms will be used to predict and detect impending system failures at an early stage, which will in turn extend the service life of the systems. ACC and Climatec will continue to collaborate on new developments and continue their long-term partnership based on trust.

Detecting anomalies reveals insights.



Account Executive Nick Kramer worked closely with the ACC teams.

 Learn more about the solution.

About the person

Miriam Klein is Team Lead Service & Portfolio Management for Energy Data Services at Bosch Energy and Building Solutions. After completing a dual study program at Robert Bosch GmbH and a master's degree in business informatics, she is now combining her commitment to sustainability issues with her interest in IT and technology.

Teamwork for energy-efficient buildings

Miriam Klein has a vision: to make commercial buildings in Germany climate-neutral through digitalization

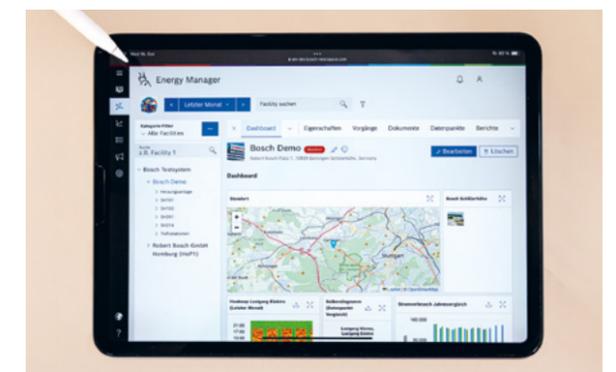
Miriam Klein loves data. Together with her team at Bosch Energy and Building Solutions, she collects data from customers and uses this information to increase energy efficiency in existing buildings. After all, transparency about consumption is the first step towards achieving climate neutrality. "It's about taking action promptly, regardless of the technical status of the property," says Miriam Klein.

Data as the basis for energy efficiency

"Digitalization offers opportunities without which many of the challenges of the future cannot be overcome. We highlight the potential in a way that is tangible for the customer in their current situation," Miriam Klein continues. She sees much need for action and great potential for savings, particularly in existing buildings. As a result of the revised EU Energy Performance of Buildings Directive (EPBD) and the Energy Efficiency Directive (EED) for the building sector, decarbonization targets need to be achieved by 2030. This includes the introduction of new measuring instruments and orientation values that make building energy efficiency more visible and measurable.

Sustainability and digital transformation

"In order to manage properties efficiently and in compliance with the Buildings Energy Act, we need to know as much detail as possible about the precise individual consumption levels," explains Miriam Klein. She shows building operators the path to a digital and energy-efficient future. To do this, she works closely with the building automation team at Bosch Energy and Building Solutions. After all, major levers for achieving the 2030 climate targets lie in the energy and building sector. A Bitkom study shows that smart building technologies could save 12 million tons of CO₂ by 2030. Building automation alone can increase savings by a further third. ➔



The NEXOSPACE Energy Manager provides customers with transparency relating to consumption at their properties.

Without reliable data, energy saving is a product of chance.

Bosch supports customers through change as a partner

“We have developed a maturity level model that supports customers based on the level of digitalization in their energy management,” explains Klein, who leads a six-strong team of developers, project managers, portfolio managers and application engineers. “Our customers appreciate the fact that we support them in all phases – from strategy development through to implementation.” The aim is to develop customized solutions that create

added value, such as measurable ad hoc savings. For systematic energy management, Miriam Klein’s team collects detailed consumption data, which is integrated into digital services such as the NEXOSPACE Energy Manager. Reliable, daily consumption data enables customers to identify energy peaks, leakages and potential savings and to introduce appropriate energy efficiency measures. In addition, IoT systems can help mitigate the shortage of skilled workers through automation.



Close collaboration within the team brings out the best ideas and is just as important as intensive discussions with customers.



Get to know Miriam and our team.

Networked video solution ensures security at concerts

The Ziggo Dome in Amsterdam, one of the largest arenas in Europe with space for up to 17,000 visitors, relies on an innovative video solution from Bosch Energy and Building Solutions. Over 300 cameras with intelligent analysis functions ensure security both indoors and outdoors. The integrated video analytics system can count the number of people in compliance with data protection regulations, allowing operators to analyze flows of people and identify any suspicious situations. In addition to increased protection for visitors, the system also enables the deployment of service staff as required as well as optimizing services for guests.

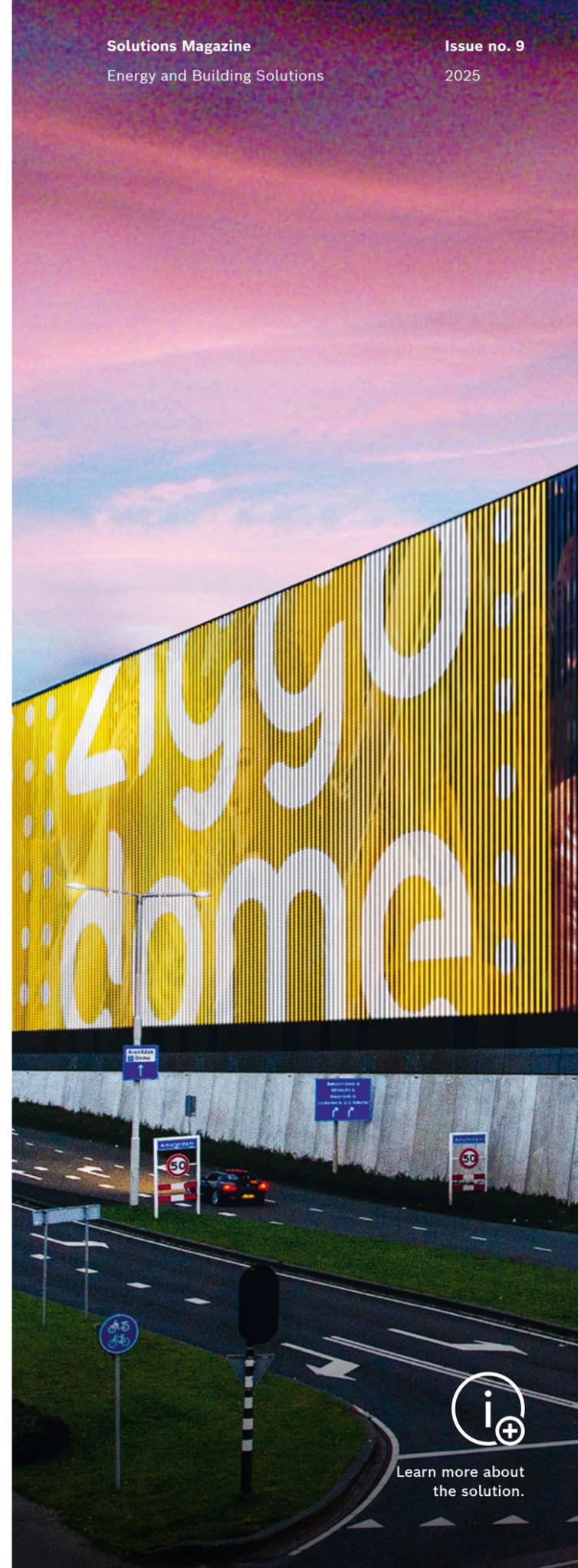


Successful teamwork: Vincent van Asselt (left, Bosch Energy and Building Solutions Netherlands) and Emile Rietveld (right, Ziggo Dome).

Live on stage



Learn more about the solution.



AI

in Smart Buildings

Ever faster, ever smarter – few technologies are developing as rapidly as artificial intelligence. The fact that AI applications can now be implemented with significantly less effort and in ever-shorter timeframes is made possible by foundation models, which simplify the previously complex training of data and networks. These new models are trained using very large volumes of data and can therefore be used for tasks that do not require individual training. In the building context, foundation models change the type of scalability. Commercial buildings are usually very specific and, unlike cars, are not built in the same way over and over again.

Therefore, it is not possible to train a separate AI application for each property. Foundation models can be a huge help in terms of scalability, as they are trained more broadly. Pre-trained models are made available for this purpose, which simply need to be adapted to the individual task. These are based on large language models, for example, whereby, building adapters are trained once using large volumes of building data and are then made available and can be used. These adapters then just need to be parameterized and can be used as often as required in different buildings. AI in facility management is used in a variety of scenarios. Examples include automated instructions for safe escape routes in the event of a fire, voice interaction with the building, or where a building automatically recognizes its own energy consumption and pre-orders energy, and can also detect and report malfunctions in the building technology. With a view to Smart Buildings and networked buildings, this is a major step forward: foundation models will enable autonomous buildings and, thanks to the new type of scaling, entire property portfolios can be automated without having to train vast amounts of data in advance.

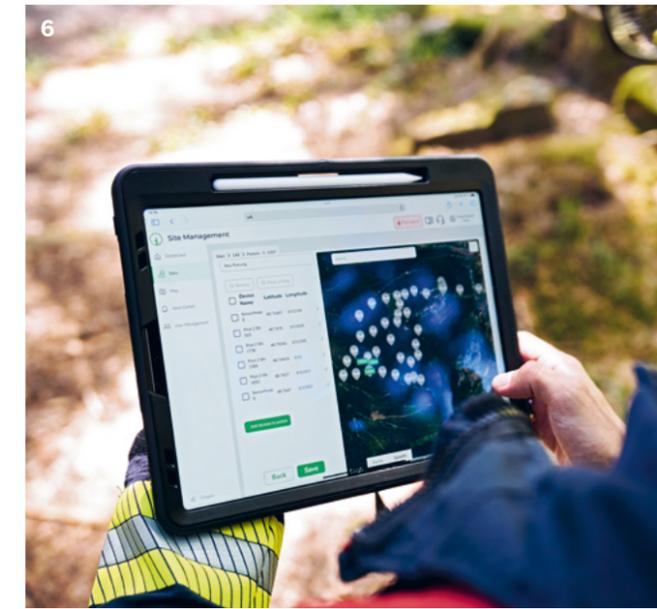
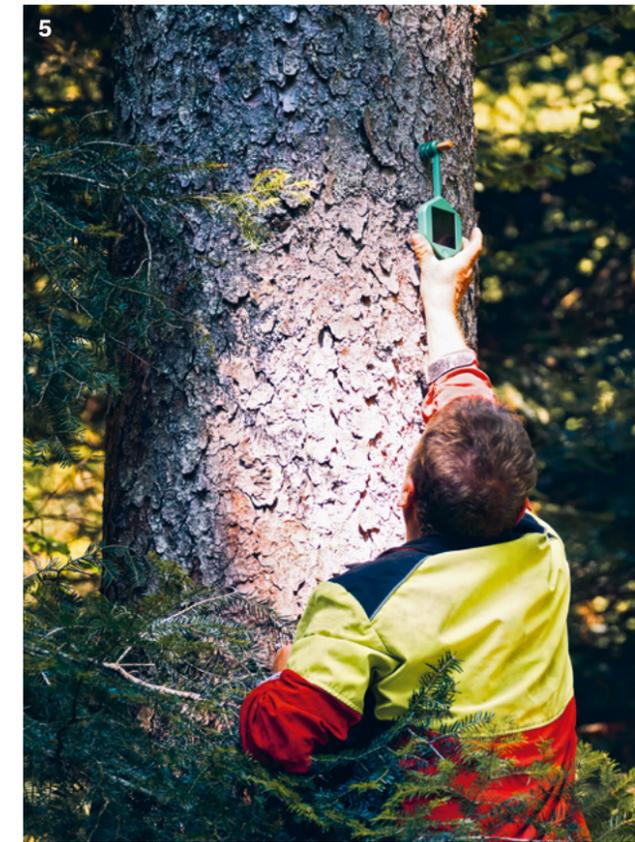




From the funicular railway to the forest

To protect a popular tourist region from the dangers of fire, Bosch Energy and Building Solutions has implemented networked solutions for early warning.

The idyllic spa town of Bad Wildbad and its popular excursion destination, the Sommerberg, lies in the middle of the densely wooded Northern Black Forest. Around 500,000 visitors come here every year. Not just for hiking, as the Sommerberg activities include a treetop trail with a viewing tower, an adventure forest and the Wildline – a spectacular suspension bridge, for example. “The view from up there is wonderful,” says Benedikt Behl, who not only knows his way around Bad Wildbad, but has also visited the Sommerberg several times. As Sales Manager at Bosch Energy and Building Solutions, he is the first port of call for customers in this region and is proud of the safety and security solutions that have been installed in Bad Wildbad so that tourist attractions, the forest and, above all, the Sommerberg funicular railway are better protected against fires. ➔



1 Intelligent algorithms in the AVIOTEC camera immediately analyze the captured images.

2 The customer has an overview of everything in the technical control center.

3 The Bosch team on their way to the Sommerberg.

4 The Sommerberg funicular railway covers a height difference of 300 meters and a length of 740 meters on gradients of up to 29 percent.

5 The sensors operate maintenance-free for 10 to 15 years and, thanks to integrated solar panels, are self-sufficient in terms of energy.

6 The BOS portal has an integrated alarm server and contains all the important information.

Intelligent early fire detection ensures greater safety in and around the funicular railway

Baden-Württemberg’s highest funicular railway has been connecting the center of Bad Wildbad with the Sommerberg for over 100 years. The carriages transport many tourists every half an hour and also provide the public transport connection between the city center and the residential and working area of the Sommerberg. Since its first journey in 1908, the train has been continuously modernized and was recently equipped with the intelligent AVIOTEC video-based early fire detection system from Bosch. The solution installed along the railway track and in the machine room at the

mountain station detects smoldering fires and small fires directly at the source within seconds. “The train has no driver on board who can react to a fire on the track or similar incidents. If our system detects smoke, an alarm is immediately sent to the person on duty at the mountain station, who can then respond right away. For example, by stopping the carriage to prevent it from driving into the fire without braking,” continues Benedikt Behl. The technical control center, from which the Sommerberg funicular railway is controlled, is installed at the mountain station. This is where Technical Operations Manager Rafael Lopez starts and controls the entire operation: “I’m a firefighter myself, so I was

immediately convinced by the concept”. In the machine room, which is also located in the mountain station, a camera continuously monitors the electric motor that drives the carriages using an 800-metre-long traction cable. While a conventional fire detector only reacts when smoke has risen to it, the AVIOTEC solution can even detect an incipient fire, caused by a spark for example. Rafael Lopez believes that the drive unit is now much better protected: “The system we have now is very technologically advanced and plays an important role in protecting our guests and preserving the railway itself. What’s more, this solution also increases safety in the immediate surroundings along the tracks.”

Intelligent protection for the forest – an economic factor

Following the successful collaboration on the funicular railway, the city, fire department, forestry department and the operators of the suspension bridge decided to also protect parts of the surrounding forest from the dangers of fire by deploying an innovative technology solution from Bosch. Benedikt Behl brought his colleagues Heiko Schwichtenberg, Christoph Vieregge and Frank Richter on board for this. The Wildfire Detection team has developed an innovative total solution for the early detection of vegetation fires. To prevent an initial undetected smoldering fire from developing into a ☹️

large-scale fire, the combination of early warning and precise information is crucial. “Here in Bad Wildbad, the forest is also a tourist attraction and many jobs depend on it,” says Benedikt Behl. “Those involved know all too well what damage an undetected fire could cause and that the risk is always there.” An important part of the solution from Bosch Energy and Building Solutions is a network of inconspicuous sensors that are used as intelligent sniffer devices in the forest. They detect gases that are released at an early stage during a vegetation fire and also record other important information such as temperature, humidity and air pressure. The fire protection experts at Bosch have designed the sensor network in such a way that critical points are specifically protected. Bad Wildbad forestry staff installed around 30 gas sensors in the forest at the visitor hotspots on the Sommerberg. If a sensor sounds an alarm, the Bosch

cloud-based BOS portal provides all the important information that the control center dispatcher needs to safely guide the emergency services to the scene of the incident in accordance with the rules of the authorities and organizations for security tasks. “It may not be possible to prevent forest fires. But we can shorten the detection time and thus raise the alarm more quickly. This is extremely valuable, because if there is a fire up there, every minute counts,” explains Andreas Wacker, Forestry Division Manager in Bad Wildbad. At the end of the project, Benedikt Behl and his colleagues stand on the impressive suspension bridge above the fir treetops of the Black Forest and take in the view: “It’s great that our innovative solutions can help to provide better protection for the funicular railway, the Sommerberg, its forest and its attractions.”



Get more details about this project.



7 The fire department and forestry department in Bad Wildbad were closely involved in the implementation.

8 Christoph Vieregge, Frank Richter and Heiko Schwichtenberg from Bosch during planning.

RheinfelsQuellen H. Hövelmann GmbH & Co. KG

Digital management of visitor and delivery traffic

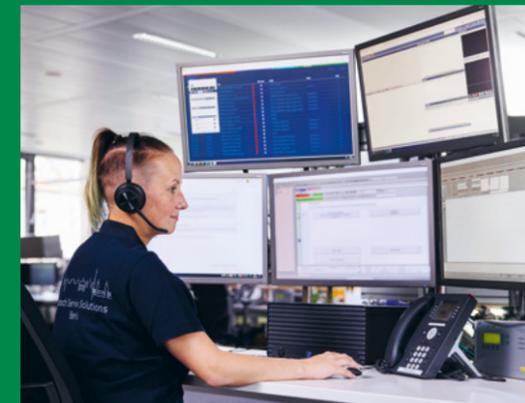


RheinfelsQuellen is a leading German company in the bottling of natural mineral water and high-quality soft drinks. Known for quality and sustainability, the beverage manufacturer also relies on state-of-the-art technologies for building security. Taking IFS Food Standards into account, the Bosch Energy and Building Solutions team installed a networked access control solution in conjunction with visitor

management and perimeter protection at the Dortmund, Fachingen and Duisburg sites. With the visitor management system, visit processes and delivery traffic are automated and documented in an audit-proof manner, thereby increasing efficiency. This successful partnership has led to less bureaucracy for employees and greater productivity in logistics.

40 Years of transformation
And more to come

Security around the clock



Since 1985, the Bosch control center network has been operating 24 hours a day, seven days a week, monitoring fire, intrusion, video and alarm systems and today it processes more than 50 million alarms every year. With over 85,000 connected systems and 250 employees at locations in Frankfurt, Berlin, Leipzig and Magdeburg, customers can rely on maximum reliability and security. The control center network and the clearing center that has been part of it for 20 years filter and coordinate the incoming alarms from customer systems that are not directly connected to the police or fire department. These are checked and any critical incidents are forwarded to the authorities. For optimal customer service, the Bosch control center network is continuously developing its services. This includes, for example, the introduction of services with artificial intelligence or drone missions for situational awareness.

For a fairer future

The Robert Bosch Foundation provides global impetus for health, education and cohesion

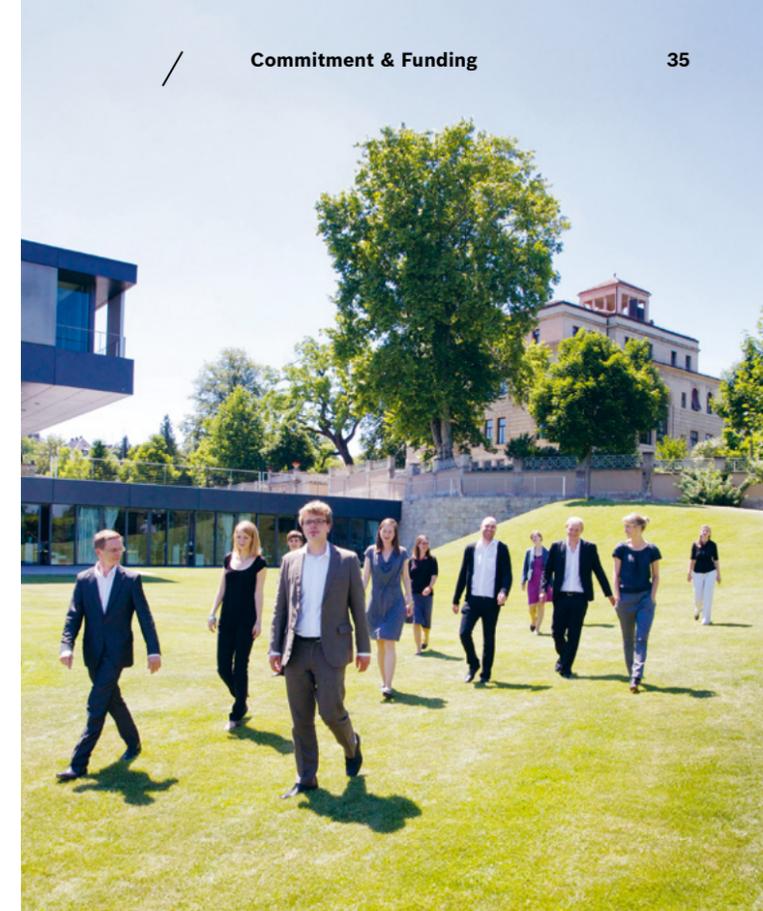
The Robert Bosch Foundation has been committed to a fair, peaceful and sustainable future since 1964. “As a foundation, we have a special privilege: we can be courageous and consciously take risks – always with the aim of making the biggest possible difference for a better future. Together with our partners, we want to develop solutions in the funding areas of health, education and global issues that go beyond individual project results and achieve a broad and deep impact,” says Managing Director Bernhard Straub.

In his legacy, entrepreneur and founder Robert Bosch formulated a dual mission: to ensure the successful development of his company on the one hand and to continue his social commitment on the other. In order to tackle social challenges such as health, educational equality, humane migration and democracy, the foundation has invested over EUR 2.3 billion in charitable projects worldwide in recent decades. Milestones in the foundation’s history reflect key topics such as the fall of the Iron Curtain, the refugee crisis

On June 6, 2024, as part of the #IchStehAuf initiative (English translation: I stand up), 300,000 pupils and their teachers – from primary schools to vocational schools – set an example for democracy and diversity across Germany.



The premises of the Robert Bosch Foundation in Stuttgart: in the background is the former home of the company founder, in the foreground the modern Bosch Haus Heidehof.



in 2015/2016 and the Russian war of aggression against Ukraine. All activities are pursued exclusively for charitable purposes. As the main shareholder of Robert Bosch GmbH, the foundation finances its work from the company’s profits. The foundation and the company work independently of each other in terms of their focus.

In focus: health, democracy and education

In the area of healthcare, the foundation is committed to a sustainable healthcare system, funding cutting-edge medicine and innovative healthcare. At the Bosch Health Campus, PORT centers throughout Germany receive support in the provision of comprehensive primary and long-term care. Over half a billion euros are to be invested in healthcare

at this location in Stuttgart alone over the next five years. Strengthening democracy is also a key focus area: projects such as “Hallo Bundestag” promote interaction between citizens and politicians, while the Robert Bosch Academy provides a platform for international experts to discuss global challenges. In the education segment, the foundation is committed to a fair system and every year it honors outstanding schools with the German School Award. Founded in 2014, the Robert Bosch College UWC in Freiburg is the largest single project in the foundation’s history to date. As part of a network of 18 United World Colleges, it promotes intercultural understanding and tolerance among young people from all over the world.

Good connections



At the Port of Vancouver, Bosch subsidiary Paladin Technologies has equipped an entire terminal with security technology.



Among other things, Paladin's services include structured cabling for buildings. Shown here: Brandon (left) and Rajinder.

It's a mild early spring afternoon in Vancouver, Canada. Thick clouds hang over the port, which runs along the southern shore of the harbour. The last patches of snow are still visible on the mountaintops. In DP World's expanded and redesigned full-service terminal, cranes are busily transferring containers – around 6,000 of which are stacked there – from ships onto trucks and trains. Designed as a multimodal transportation hub and spanning 83 hectares, the company's port facility plays a major role in Trans-Pacific Trade. Paladin Technologies Inc., a Bosch subsidiary, has installed more than 300 video cameras there, many of them mounted on poles more than 20 meters tall, and fitted nearly 200 doors and gates with access control systems. The cameras ensure the security and safety of merchandise and over 300 employees of DP World. It's a demanding project for a customer that expects top quality. But that's business as usual for the experienced team at Paladin Technologies – and one of the reasons why the company's many customers value their problem-solving competencies and reliability and have remained loyal to them for many years.

With 37 offices and 1,700 employees across Canada and the USA, Paladin Technologies ranks among North America's leading building system integrators. Just like DP World, customers from all markets, including airports,

universities, hospitals, and data centers, value their outstanding expertise and services. Paladin Technologies provides turnkey solutions, equipping buildings and infrastructure with state-of-the-art security systems and handling everything from wiring across installation to setup. Paladin's portfolio also includes aftersales monitoring and systems upgrading services, which the company was contracted to provide for another highly complex undertaking in Vancouver. It involved modernizing the technical systems of the 60-year-old George Massey Tunnel, which is used by over 80,000 vehicles each day. Over the course of the eight-month project, Paladin's team replaced the lane control signals, street lighting fixtures, signs, and 50 video cameras inside and outside the tunnel. Unlike the project at DP World's container port, there wasn't always a refreshing sea breeze for the team members to enjoy. Much of the work was done underground, including laying around seven kilometers of fiber-optic cables. Total concentration was essential to avoid endangering their own safety. But that wasn't a problem for the experienced team that completed this project with their usual high quality and reliability – thus making a major contribution to ensuring that this important link between the cities of Delta and Richmond will be able to meet increasing traffic demand over the next 20 years.



See the Paladin team in action in the George Massey Tunnel.



We are in the aer!

Creative collaboration in an inspiring environment – the new building at the headquarters of Bosch Building Technologies impresses with its secure and convenient working environments housed in state-of-the-art architecture.

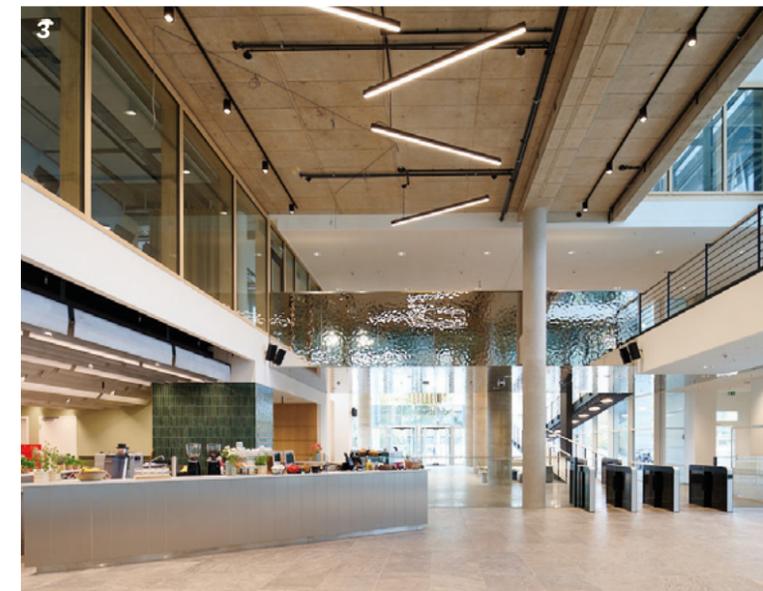


1 A networked video solution that monitors the interior and exterior is used to track possible scenarios such as intrusions or vandalism.



2 Lots of air (aer is Latin for air) and light as well as wooden elements create a feel-good atmosphere.

Entering the prestigious foyer of the aer through the main entrance, visitors are immediately struck by the impressive wooden ornate element on the ceiling, the decorative plants and the extravagant reception counter made of recycled glass. Since August 2024, the aer in Munich has been the new headquarters of Bosch Building Technologies. The existing office building, which was completely refurbished and extended to include additional floors and a new main hall, not only impresses with its modern room concept with light-filled, open areas that enable flexible working. New standards have also been set here in terms of security and comfort – thanks to an integrated security and building automation solution implemented by the Bosch Energy and Building Solutions team. Sustainability is a top priority in the building – instead of relying on concrete for the extensions, the company opted for the renewable raw material wood. Instead of disposing of demolition materials, these were reused in a modified form in the refurbished building. An innovative heating and cooling concept rounds off the sustainable approach at the new Bosch site.



3 The security solution consists of an access control, time recording, fire detection, intrusion detection and voice alarm system as well as a video solution.

4 Open spaces invite people to communicate and network.



I really value the hands-on and SME-oriented approach of Bosch Climate Solutions.

Dirk Neumayer, Managing Director of Richard Neumayer GmbH

”

In this interview, Dirk Neumayer, Managing Director of Richard Neumayer GmbH, explains how sustainability and competitiveness go hand in hand for him and why partners such as Bosch Climate Solutions provide the necessary orientation.



To the interview.

”

We have developed a holistic strategy.

Margarete Gödel, Shareholder CEMO

One step at a time: With the support of Bosch Climate Solutions, the long-established family business CEMO has embarked on a sustainability journey. Shareholder Margarete Gödel shares personal insights, explains where the challenges lay and tells us why she would take the step over and over again.



To the interview.



On the road

Two traditional family-owned companies share insights into their sustainability journey with Bosch Climate Solutions.

Growth!

Bosch continued to expand its systems integration business last year with various acquisitions. Growth was particularly strong in building automation.

In Germany, DMS Digitale Mess- und Steuerungssysteme AG was acquired. The company has over 40 years of experience in the development, planning, programming, installation, operation and maintenance of control technology. The product-agnostic specialist implements intelligent automation solutions based on the latest technologies to safely, reliably, and efficiently control and regulate building and process engineering systems. DMS AG's solutions can be found in complex manufacturing plants, data centers and research and development facilities. With the acquisition of DMS AG, Bosch Energy and Building Solutions has added the important area of process automation to its range of services, thereby becoming a full-service provider for industrial manufacturing companies. There was also further growth in the USA. The Bosch subsidiary Climatec has acquired Engineered Control Solutions (ECS), a leading provider of system integration and building automation with around 100 employees and branches in North

and South Carolina. The company offers solutions for the efficient control, regulation and monitoring of technical building equipment such as heating, ventilation, air conditioning and lighting. Customers include educational institutions, public administration, the health-care sector and commercial buildings. With the acquisition of ECS, Climatec has further expanded its position in the building automation market and strengthened its regional presence in the southeast of the USA. Customers of both companies benefit from an expanded range of building solutions. With the acquisition of Nederlandse Veiligheidsdienst Groep Meldkamer B.V. in the Netherlands, Bosch Energy and Building Solutions has expanded its existing service portfolio in building security to include modern control center services such as the monitoring of incoming alarms in the areas of intrusion, fire and video as well as the coordination of all measures, including briefing the fire department and police.

K+S Kaliwerk Zielitz

Intelligent video solution for seamless perimeter protection

K+S is an internationally oriented raw materials company with production facilities. As the largest single K+S site, the Zielitz potash plant in Saxony-Anhalt extracts crude salts containing potassium for the production of fertilizers, products for industrial applications and products for the animal feed and food industry. In terms of annual output volume, the plant is one of the largest and most modern potash plants in the world. K+S relies on its long-standing partner Bosch Energy and Building Solutions to secure the perimeter.

An intelligent video solution protects the three-kilometer-long border area and as soon as a thermal camera detects an incident, the pan/tilt/zoom cameras automatically move to this position. Verification takes place within just a few seconds, meaning that a defined danger can be responded to in the shortest possible time. False alarms are largely a thing of the past thanks to intelligent video analytics, which offers reliable detection, even at long distances and in extreme weather conditions.



High Performance Computing Center at the University of Paderborn

Efficient use of waste heat



At the University of Paderborn, the waste heat from the high-performance computing center is used as an energy source for properties on the campus. Buildings with heating requirements can request it from the data center. This is thanks to an automation solution that also ensures safe operation, with redundant automation strategies covering a wide range of malfunction scenarios. 350,000 homes per year could be supplied with energy for heating and hot water using the waste heat from large data centers in Germany. (Source: Bitkom)



Learn more
about the solution.



The pharmaceutical service provider Vetter is further expanding its capacities for the aseptic filling of medicines. At the Ravensburg Schützenstraße site (SST), the first three of the production building's seven cleanrooms were equipped by the end of 2024. Hörburger GmbH, a subsidiary of Bosch Energy and Building Solutions, was responsible for the specially developed building automation solution to regulate supply air, temperature and humidity. There are three Vetter production plants in and around Ravensburg alone, where over 200 million units of injectable medication are filled and packaged for leading pharmaceutical and biotech companies every year. In each cleanroom, precise control and continuous monitoring of temperature, humidity and pressure are essential. This is the only way Vetter can meet the strict GMP (Good Manufacturing Practice) regulations and the requirements of the competent authorities worldwide, such as the U.S. Food and Drug Administration (FDA) standards for sterility and quality. →

Building automation in the cleanroom

The aseptic filling of medication places the highest demands on pharmaceutical service providers. Vetter in Ravensburg relies on building automation solutions from Hörburger GmbH.

Strong team on site at Vetter Pharma-Fertigung GmbH & Co KG: Markus Steurer, Project and Sales Engineer (left) and Florian Thunitgut, Project Manager, both Hörburger GmbH.



Discover
more details.

- 1|2 After the control cabinets had been built, and extensive quality tests had been carried out, acceptance took place under sterile conditions at Vetter in Ravensburg during a trial production run.
- 3 The building automation solution keeps the sensitive system of temperature, air pressure and humidity in the cleanrooms in balance. The Vetter team always has transparency regarding the conditions in the cleanroom.



The Hörburger team programmed the building automation system to ensure constant cleanroom conditions. Highly sensitive sensors in the cleanroom continuously measure the relevant parameters. All the systems in the building that are connected to the ventilation system in the cleanrooms were included in the planning stage. Only after project planning, engineering and control cabinet construction were completed and the corresponding quality tests had been carried out at Hörburger in Waltenhofen were the control cabinets set up at the customer's premises in Ravensburg. They were then tested in a cleanroom environment that was not yet sterile, and the software was programmed so that the building automation could withstand the production environment. Final acceptance took place under sterile conditions and during trial production.

During operation, the ventilation system's control reacts immediately to fluctuations in order to keep the conditions within the pre-defined, narrow tolerance

ranges. The automation software was programmed in such a way that the pressure curve in the room remains stable. The Vetter operating team can view all the data live on mobile devices via the building management system set up by Hörburger GmbH. In addition, intelligent evaluation enables the early detection of malfunctions, for example. What's more, the most important components such as frequency converters and sensors for room pressure regulation were designed with redundancy.

The collaboration between Vetter and Hörburger has grown continuously since the first project in 2017. In 2024, the project was completed for three cleanrooms, with more to follow in the coming years. Hörburger GmbH is now responsible for the entire building automation at the Ravensburg site. This is because Vetter wants its partners to arrive on site quickly and for all aspects of building automation, from planning to installation, to come from a single source.

About Vetter

Vetter Pharma-Fertigung GmbH & Co KG is a leading "Contract Development and Manufacturing Organization" (CDMO) in the pharmaceutical industry. The pharmaceutical service provider with headquarters in Ravensburg was founded in 1950 and now has over 7,000 employees at its locations in Germany, Austria, the USA and Asia.

History meets innovation

Combining modern building technology with historical architecture and listed buildings often requires a wealth of ideas and a sure instinct. Our team has brought these UNESCO World Heritage Sites and listed buildings, among others, into the present day with smart technology solutions enabling optimal protection and efficient operation, and ensuring their preservation for a long time to come.

7
93

Aachen Cathedral
An intelligent safety and security solution with over 50 discreet cameras detects fires before they start and protects the valuable works of art and shrines from intruders and vandals.

15
04

Luther Memorials Foundation
Five museums whose cultural assets and visitors are optimally protected by a networked solution for video security, fire and intrusion protection. Efficient to operate thanks to a management system.

17
53

UWC Robert Bosch College
The magnificent former priory of the monastery is now the school building of the international boarding school. A solution for fire protection, voice alarms, access control, energy supply and energy management ensures safety, security and efficiency.

18
40

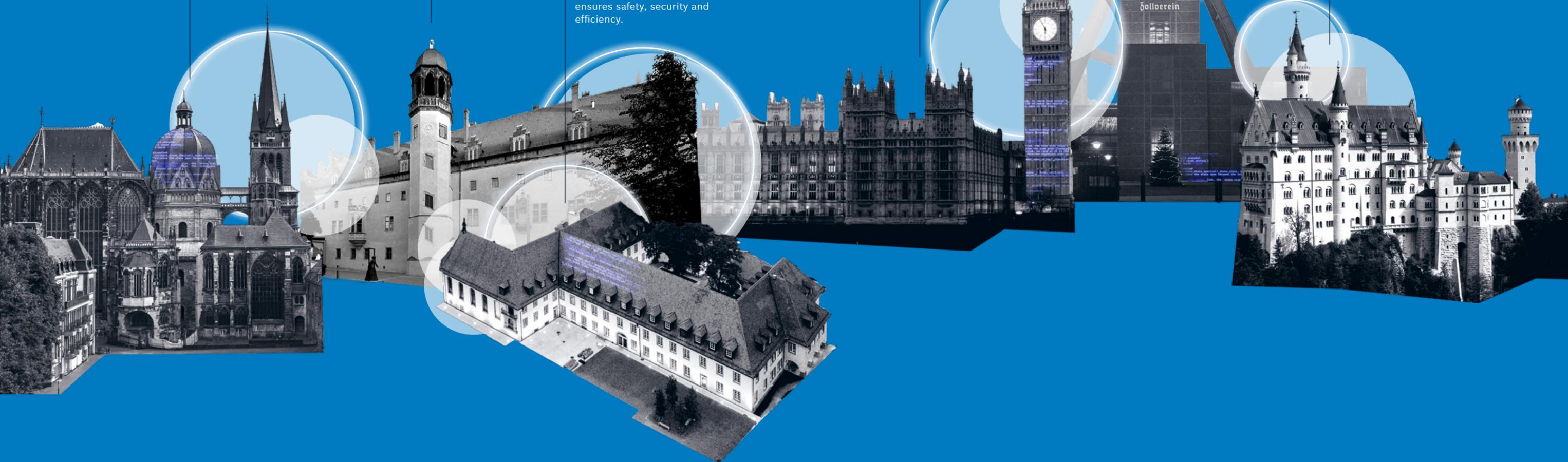
Palace of Westminster
Bosch subsidiary Protec UK has equipped the entire grounds of the Palace of Westminster with unobtrusive fire detection and voice alarm technology. The security solution blends discreetly into the historic walls thanks to its color coordination.

18
51

Zollverein colliery, Grand Hall
The former compression building of Zollverein colliery is now a multifunctional event location. The solution for fire protection and voice alarms, including controls for elevators, lighting and smoke extraction, among other things, was implemented entirely by our building experts.

18
68

Neuschwanstein Castle
The world-famous building of King Ludwig II already shone when it opened in 1886 with state-of-the-art materials and technology. A modern fire alarm and evacuation system now ensures that visitors are kept safe. In the event of an incident, the incident is analyzed and rectified via the remote service.



Bosch Security Academy

Tailored training

Customers and partners can enhance the technical and planning knowledge of their employees through training courses at the Bosch Security Academy. The trainers provide practical technical and regulatory qualifications in the field of building and security technology. Besides a wide range of courses on the application of the applicable regulations and guidelines, the program also includes seminars providing in-depth insights into the latest technologies and functionalities of safety and security systems.



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The magazine *Bosch Energy and Building Solutions* is aimed at customers, partners and other interested parties.

It provides information on issues and projects related to increasing safety, security, comfort and efficiency in commercial buildings.

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