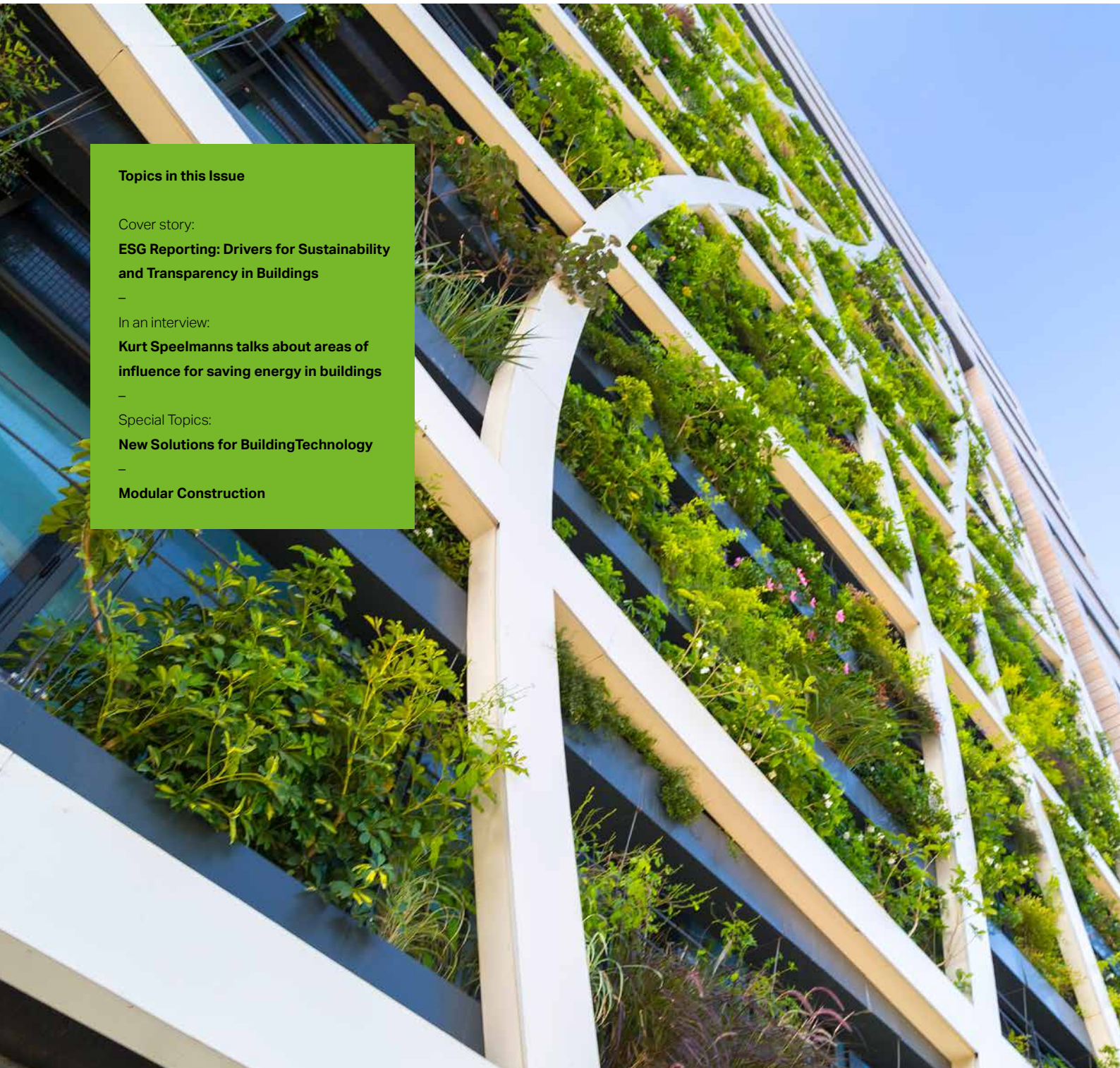
BUILDINGS IN TRANSITION

ENERGY, ENVIRONMENT AND ESG: FORCES DRIVING CHANGE



Topics in this Issue

Cover story:
ESG Reporting: Drivers for Sustainability and Transparency in Buildings
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In an interview:
Kurt Speelmanns talks about areas of influence for saving energy in buildings
–
Special Topics:
New Solutions for BuildingTechnology
–
Modular Construction

VISUALIZE THE DATA: INCREASE EFFICIENCY.

Prepare buildings for mandatory ESG reporting and optimize efficiency using the new cloud-based services: WAGO Building Energy Management and WAGO Building Environmental Reporting.

www.wago.com/building-cloud-services

SYMBIOSIS IN BUILDINGS
PRECISE LIKE CLOCKWORK

Dear Readers,

Imagine that a building is like a well-tuned clock – every component plays a unique role in supporting the overall system to function smoothly and precisely. Analogous to a complex mechanical clock, the individual elements of building technology, such as lighting management, HVAC automation, room automation and energy management, are independent cogs, which all contribute individually to efficiency and functionality.

The true magic arises when all of these cogs work together perfectly, coordinated by a sophisticated system – comparable to a sophisticated clockwork mechanism. In our current issue of **WAGO DIRECTBUILDING**, we take you on a journey through the world of building technology, in which we illuminate both the visualization and security of data, and also the integration and coordination of individual building technology systems.

A central focus is on the development of an integrated building management system that optimizes the performance of each individual element, like the precise interplay of gears in a timepiece. Using the modular WAGO Building Ecosystem (in special topics starting on p. 18), we create an overall system in which each cog engages harmoniously, which in turn creates a masterpiece of efficiency. The fact that WAGO now also supports the secure BACnet/SC extension is another important step. In buildings, cybersecurity is a central topic and secure, encrypted communication is thus indispensable for individual components and a protected overall system.

In this issue, you will also discover new sustainable approaches in the industry – from the new 221 Series Green Range (p. 8), through modular construction with pluggable building installations, up to sensible and efficient use of energy through room automation. I am also very pleased that we were able to welcome Kurt Speelmanns, an experienced expert in the areas of influence for saving energy in buildings, as a guest speaker. You can read the entire interview with him starting on page 32.

We invite you to work with us to transform the precisely coordinated mechanisms of building technology and to understand how the integration of individual systems into an overall system not only increases performance, but also leads to more sustainable and efficient building designs.

Enjoy reading!

Martin Hardenfels

Head of Business Development Building at WAGO

WAGO DIRECTBUILDING: BUILDINGS IN TRANSITION

The construction industry is changing. Driven by their own motivation to save resources, time and money and the push to comply with external requirements, such as the Corporate Sustainability Reporting Directive (CSRD), aspects of environmental, social and governance (ESG), or the Building Energy Act (GEG), companies are increasingly relying on automated and networked building technology. In the process, they increasingly recognize the value of holistic system landscapes that unite all building systems and equipment into one mutual symbiosis. Trend-setting construction concepts, such as modular construction, are also receiving increased attention due to their flexibility and adaptability. At the same time, cybersecurity is indispensable for protecting buildings from cyberattacks. Companies, that understand these developments and translate them into action, both shape sustainable buildings and also demonstrate their responsibility to society and the environment. This issue of **WAGO DIRECTBUILDING** is devoted to specific solutions in these areas.

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CONTENTS

NEWS FROM WAGO

CURRENT SUSTAINABILITY REPORT

CONNECTING FOR IMPACT

WAGO wants to shape the future through sustainable management. Sustainability is therefore firmly anchored in the corporate strategy and in the corporate vision. The goal is to bring about positive changes and create lasting values for a better quality of life. However, this only succeeds by working together – with colleagues and in cooperation with partners. In the current sustainability report, published in September 2023, you will find the most important information about key areas of the "Connecting for Impact" sustainability program.

PLATINUM PARTNER

»BUILDING AUTOMATION. THE SECTOR. THE BENCHMARK.«

WAGO is a partner in the new VDMA initiative "Building Automation. The sector. The benchmark." Starting in October 2023, WAGO, together with around 70 other companies, has pooled its expertise relating to building automation into key technologies for energy efficiency and decarbonization in a joint initiative with the VDMA trade association AMG. The initiative stands for comprehensive competence and overarching standards – so that everything cooperates in buildings, instead of acting separately.

"With this broad information campaign, we can demonstrate why building automation is a central component for the digitalization and sustainability of commercial real estate. The core of the measures is the new sector portal, which provides up-to-date and comprehensive information about all areas of key technologies," explains Dr. Peter Hug, CEO of the VDMA Association of Experts (AMG).

A GOOD REASON TO CELEBRATE

SMALL PRODUCT, LARGE EFFECT

Five decades ago, WAGO revolutionized connection technology in electrical installations with the splicing connector. The phrase "Hey, hand me a WAGO" has been firmly entrenched in every electrical professional's vocabulary since its launch in 1974. To this day, the WAGO name represents speed, reliability and maintenance-free operation – and it has earned the loyalty of millions of electricians by helping them meet the challenges they face every day.

NEW CENTRAL WAREHOUSE IN SONDERSHAUSEN

A new milestone for the WAGO facility in Sondershausen and a clear commitment to Germany: The cornerstone for a new, highly automated and energy-efficient central warehouse was laid. The largest construction project for WAGO to date, at an investment of more than 50 million euros, will expand future capacities and is also expected to bolster international growth. As Dr. Heiner Lang emphasized at the laying of the cornerstone, sustainable logistics is the foundation and also part of a globalization strategy. A high-bay warehouse, with the latest technologies for tomorrow's customer requirements, will be built on an area of 11,000 square meters.

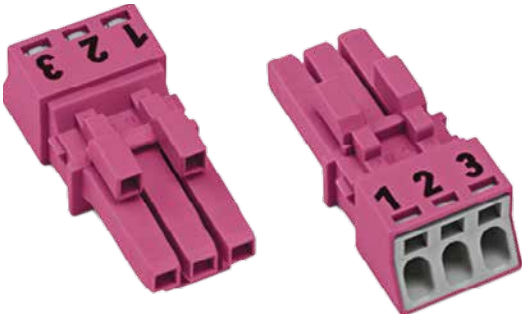
WAGO APP WITH NEW FUNCTIONS

More than 30,000 downloads in 13 countries speak for themselves: The WAGO app has caught on. Previous functional highlights include an extensive range of tools for electrical installations, a fast and reliable dealer search, and detailed, easy-to-find information on around 30,000 WAGO products.

The latest functions make the WAGO App the new all-round companion for WAGO products, applications and systems. With just a few clicks, the app supports users in quickly finding the right products, determining delivery availability and commissioning products and application solutions. The first products, such as the WAGO Sunblind Box (more on p. 26) can also be commissioned via the app.

EASY SPE CONNECTION WITH THE *WINSTA*® MINI

ETHERNET connections are increasingly standardizing field-level communication in buildings and industry. By using the WAGO *WINSTA*® MINI Pluggable Connector (890 Series), single-pair Ethernet (SPE) cables can now also be connected easily and tool-free to the *WINSTA*® Pluggable Connection System. Whether it relates to digitizing building controls or connecting sensors in industrial automation – a tool-free, fast and secure connection is guaranteed.



221 SERIES GREEN RANGE SUPPORTS MORE SUSTAINABLE CONSTRUCTION

REDUCED CONSUMPTION OF NEW RAW MATERIALS AND REDUCED ENVIRONMENTAL IMPACT THROUGH PARTIALLY RECYCLED AND BIO-CIRCULAR PLASTICS

Are you already familiar with the new WAGO 221 Series Green Range? WAGO's Green Range Splicing Connector with levers is the connector for everyone who wants to wire installations more sustainably. The reason: It consists proportionally of plastics that have a certificate of origin, are bio-circular and recycled. Consequently, the 221 Series Green Range consumes fewer fossil resources and keeps plastics in circulation. This also has advantages for construction projects.

About the New 221 Series Green Range:

- Plastics used consist proportionally of post-consumer recycled material (e.g. recycled PET bottles) and bio-based residues from industry and households (bio-circular).
- Reduces consumption of fossil resources
- Same quality and certifications as the familiar WAGO 221 Series Splicing Connectors

How Using Resource-Conserving Materials in Projects Can Pay Back Two-Fold

Guidelines for implementing sustainability in material selection have existed for a long time. The electrical products used can also fall within this purview. One example is the ecological criteria catalog for Munich, which prescribes mandatory criteria

MATERIAL COMPARISON: 221 ORIGINAL VS. 221 SERIES GREEN RANGE*

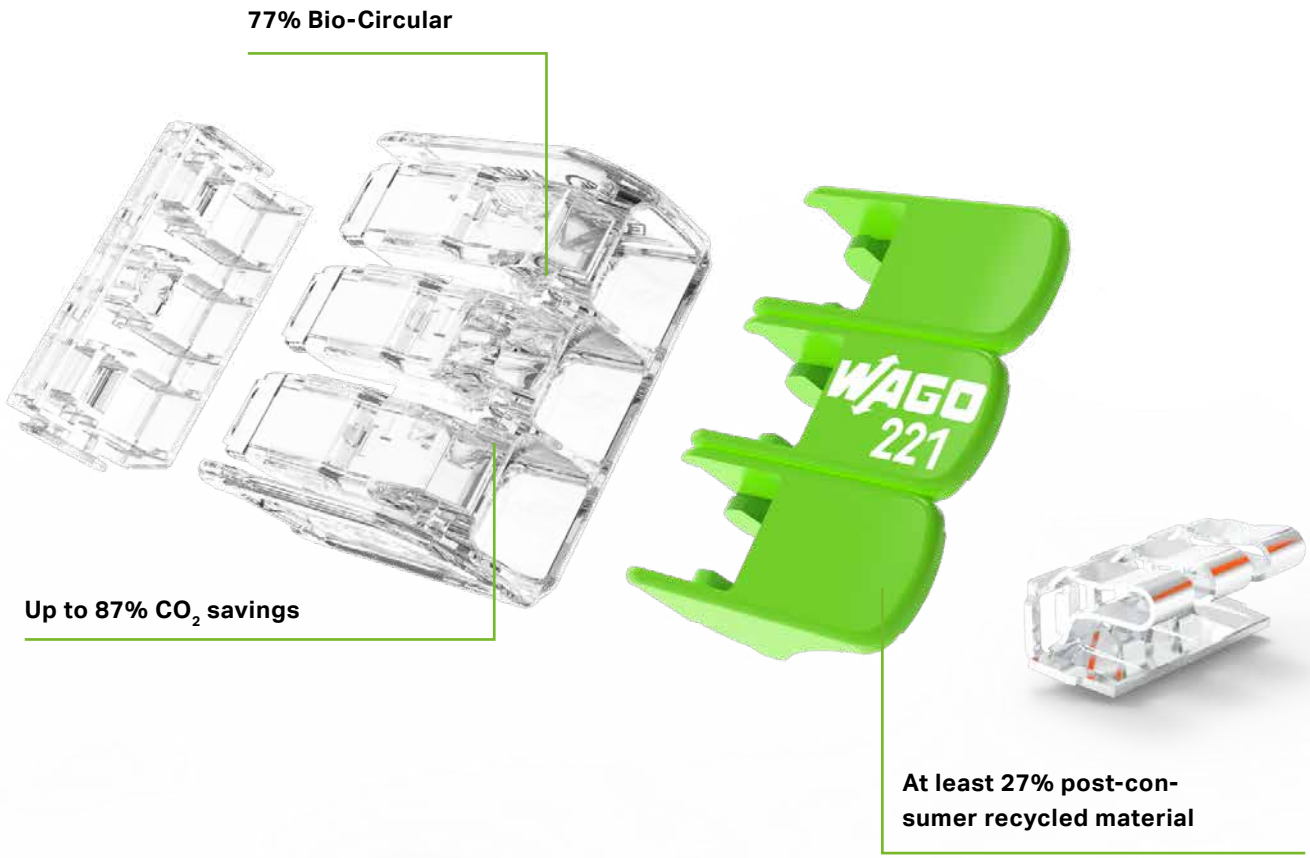
221 Series Original:
- 75% standard PC (housing)
- 25% standard PBT (lever)

The regranulate portion consists of approx. 35% internally processed raw materials overall.

221 Series Green Range:
- 58% bio-circular PC (housing)
- 17% standard PC (housing)
- 18% standard PBT (lever)
- 7% recycled PBT (lever)

The regranulate portion consists of approx. 29% internally processed raw materials overall.

* Approx. 2/3 of the plastic consists of more sustainable materials compared to the original 221 Series Terminal Block.



for more sustainable construction for residential, commercial and industrial buildings. Raw materials should be used sparingly and environmental pollution should be reduced, among other things. The proportion of recycled and bio-circular materials used in the 221 Series Green Range reduces the need for new raw materials and, thus, the environmental burden.

Even if no fixed criteria exist for more sustainable construction, using resource-saving electrical interconnection products can pay off. Some banks offer discounted interest rates for projects with greater sustainability. For example, the "environmental Rating for Building Financing" from the Umweltbank assesses construction projects according to ecological criteria, among other possibilities. If the project meets the requirements for reused and recycled building materials that conserve resources, the interest rate drops. In addition, the German government promotes sustainability aspects through its own sustainability class, and awards the "Sustainable Building Quality Seal."

With the Green Range 221 Series, WAGO is already adapting to increasing demands for sustainability. And this follows the motto: Connect today with tomorrow!

What is special about the 221 Series Green Range?

Until now, we have been processing plastics made from fossil raw materials. Part of the molecular chains from fossil raw materials in the PC and PBT plastics have now been replaced by polymers obtained from post-consumer waste and bio-based residues. With the 221 Series Green Range, WAGO now purchases plastic, which consists partly of biocircular material (77% PC content) and circular material (27% PET post-consumer content with PBT).

In addition, the 221 Series Green Range packaging is made of grass paper. Everything else (copper, spring steel and WAGO production steps) is identical to the conventional orange 221 Series terminal block.

ESG REPORTING: DRIVER FOR SUSTAINABILITY AND TRANSPARENCY IN BUILDINGS

The building sector is receiving increased attention when climate protection is discussed. After all, the building sector still remains one of the largest contributors to greenhouse gas emissions in Germany. However, awareness of the urgency of climate protection is steadily growing, and the industry is faced with the challenge of developing increasingly more energy-efficient and environmentally friendly solutions – as well as recording energy data and reporting in the form of ESG reports. The visibility of building data, overcoming large-scale digitalization deficits and rethinking data processing, for example towards the cloud, play key roles in this.

Background: The Importance of the Building Sector for Climate Goals

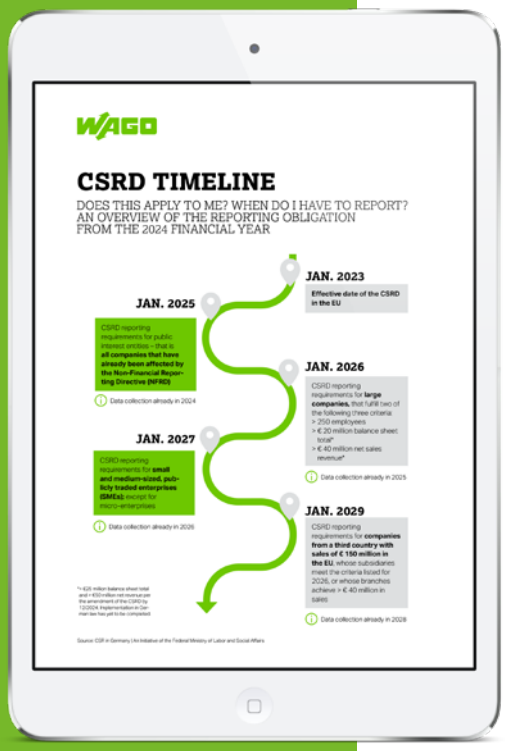
Sustainability in buildings extends beyond the mere implementation of technologies. Intelligent building concepts are playing an increasingly important role. While these concepts do help to reduce energy consumption, they can also increase the well-being of building users and reduce operating costs. For these reasons, the EU Building Directive (EPBD) already placed significant emphasis on the importance of building automation for energy-efficient operation at the beginning of 2022. A 2021 study by bitkom also concluded that the systematic use of building automation can save up to 14.7 million tons of CO_2 emissions. A decent number – until one considers that the building sector consumed 112 million metric tons of CO_2 in 2022, which is 4 million metric tons of CO_2 more than envisaged by the Federal Climate Protection Act.

Consequently, awareness of environmental, social and governance issues (ESGs) has increased considerably in recent years. Companies are increasingly being challenged by investors, customers, and employees to document and disclose their sustainability efforts. Building operators are particularly affected by this. One of the key tools for recording and communicating this information is ESG reporting.

TIP:

THE ESG INFORMATION ROADMAP

As of 2024, the first companies will be required by the CSRD to collect data and publish environmental, social and governance (ESG) reports. Our infographic discloses who is affected when, and how you can proceed step-by-step to get your personal environmental reporting with WAGO. Register now for the information roadmap and get more information!



The WAGO Building Environmental Reporting combines relevant data from digital meters, manual readings and other systems – and does so according to the requirements of the ESG reporting or energy management per ISO 50001. Engaging graphs visualize this data and provide building operators with a quick and clear overview of how their buildings perform and where optimizations are possible.

ESG: Sustainability Reporting Becomes Mandatory for Many Companies

The Corporate Sustainability Reporting Directive (CSRD) took effect in the EU at the beginning of this year. This makes it clear that the obligation for ESG reporting for many companies will begin gradually, starting in 2024. Building managers are also required to present the environmental impacts of their building operations transparently, and to take measures to reduce their environmental footprint. These include: aspects such as energy consumption, greenhouse gas emissions, water consumption, waste management and environmental risks.

At the same time, building operators themselves can also profit from the stricter requirements, and take advantage of the opportunities offered by the resulting transparency and improved sustainability. Reducing CO2 consumption is closely linked to reduced energy costs – which have become a significant markup for operating costs. However, before a building can run efficiently, the energy flows in the building must first be visible.

The Most Important Foundation: Making Building Data Visible

The first thing that building operators should consider for their ESG reporting and for optimizing their energy efficiency is the basis for all other decisions: data. "You can only have the best energy overview when the energies have also been measured." Rainer Knodel, system specialist for BACnet and building management systems at WAGO, gets right to the point. As a provider of solutions and systems for building technology, among others, WAGO as a company has always had to deal with data and, most importantly, the logical combination of data. While in the past, every building system often stored data individually, building management is now able to merge this stored data and visualize it as a whole. Building managers can recognize at a glance what energy a building is consuming at what point, can operate the building efficiently across all systems and can increase overall efficiency across the floor spaces.

With the coming ESG requirement, many companies are now being asked to make their data visible for the first time, and are also encouraged to make continuous energy efficiency improvements based on this data.

They must now digitally record, transmit and analyze consumption and emissions data. Right after transparency is created, operators can often quickly determine whether systems are running properly or whether they need to be readjusted. However, "If operators just have data, then at that moment they have no comparison points to determine whether their buildings are already well-suited, are average or they need to worry," explains Rainer Knodel. "Standardized KPIs now make this possible. They can now compare their objects to others using identical scales; at the end, they know where they actually stand."

The CSRD also shares this objective. Interoperability can also be achieved in the energy storage sector through data neutralization and uniform formats. Comparability is achieved by defining standardized metrics, as currently developed for ESG reporting by EFRAG (European Financial Reporting Advisory Group). This removes hurdles, since operators will know exactly what to measure in the future.

Added Value through Visualization

Rainer Knodel also emphasizes the visual processing of this data as another important point, which represents a great advantage for working with buildings. "In the meantime, the need to visualize stored data has gained increased recognition – in such a way that added value can be seen from the visualization at a glance." Using visually processed, and thus easily analyzable data, measures can be quickly checked for effectiveness, since effects on CO_2 emissions, for example, can be

The demands on companies to document and disclose their sustainability efforts have become progressively more stringent. Clear reports with logical key figures are also required by building operators.

directly traced. This clear, visual character was therefore also important to WAGO for its own environmental reporting. WAGO Building Environmental Reporting is a cloud-based offering from the Minden-based company, which specifically depicts energy data collection and supports its users in implementing the "Environmental" part of the ESG reporting.

Added Value through Comparability

The cloud service makes the stored data clearly visible, creates automated dashboards, and enables users to generate dependencies or templates. "This allows me to quickly determine periodic dependencies: How does this data set relate to the previous month, the previous year or even to other buildings," says Rainer Knodel. "This concept can also be used to create a template for a specific building, which I then 'impose' on each of my other buildings. This allows you to quickly determine whether this building behaves the way the template predicts, or if it differs. Only then do the measured data become valuable."

This allows the behavior of a building to be quickly identified with little effort, and added value can be generated from it, for example, by adjusting system settings. Ultimately, this increases both energy efficiency, and also the comfort and safety of building users, for example, when it comes to air quality.

The Challenge for the Building Industry: The Digitalization Deficit

The ESG reporting, which will soon be mandatory for most companies, offers a multitude of opportunities – both for the energy efficiency and profitability of the companies themselves and for the entire sector, in the direction of climate neutrality. However, it should not be underestimated how much this new requirement can initially be a challenge for affected companies, since in many places, the connection to the digitalization of the building landscape has fallen by the wayside – this deficit must now be overcome. "Many people are now faced with the task of implementing the ESG requirements with their existing infrastructure, some of which is old," recalls Rainer Knodel. In a new construction, you can correctly set up all of the meters, and establish suitable concepts. However, it is precisely existing buildings that must become more energy efficient. "If, however, I now have an existing infrastructure, which potentially includes not just one building, but instead an ensemble of multiple buildings, and the infrastructure is also rather old, then the implementation is already a challenge." Therefore, suitable technologies and solutions are urgently needed for straightforward retrofitting.

»MANY PEOPLE ARE NOW FACED WITH THE TASK OF IMPLEMENTING THE ESG REQUIREMENTS WITH THEIR EXISTING INFRASTRUCTURE, SOME OF WHICH IS OLD.«

One option is a LoRaWAN (Long Range Wide Area Network). Wireless technology makes it possible to transmit data over long distances at particularly low energy consumption. The big advantage is that any LoRaWAN-capable device can be easily integrated into an existing network – even if there is no cabling infrastructure on the meter. This offers operators, who are retrofitting their buildings, the opportunity to include old meters, so that they can incorporate this information into the system and visualize it. In this way, even a large area with multiple properties can be retrofitted for a meter reading system. It can therefore be assumed that LoRaWAN will become a common communication standard due to these features.

Cloud Systems Enable Scalability

On the system side, cloud-based systems in particular have proven to be a simple yet sustainable solution. They can be used anywhere and are especially suitable for geographically separated properties. For example, WAGO Building Cloud Services, which also includes WAGO Building Environmental Reporting, can, in combination with the ability to connect LoRaWAN sensors, function as a bridge to digitalization. Cloud systems offer decisive added value over on-premises solutions: They enable an unscaled, gradual approach. Users can start with just a few measuring points and scale up as needed. Rainer Knodel explains why this is advantageous, "With a cloud-based system, users who want to introduce energy management, meter data collection and reporting do not have to worry about selecting the right system from the outset, since systems usually have limitations. Our system is limitless due to its seamless scalability.

Rainer Knodel is a system specialist for BACnet and building management systems at WAGO. He views the ESG reporting obligation as a great opportunity for the sector.

Let's take retail as an example: A building manager can simply start up, and even if they have eventually arrived at 1,000 buildings, there is still no need to change the system. The system adapts to the demand."

WAGO Building Environmental Reporting

In order to enable qualitatively differentiated and thus valuable reporting for the user from the beginning, WAGO considered a reasonable license model to be important for the customer. "If multiple eyes view the data, then errors are detected more quickly and avoided," explains Rainer Knodel. "Different people approach the data from different points of view. This leads to significantly better evaluations." Therefore, the WAGO Building Cloud Services system is based on web technology, not licenses for individual users. It is important to display visual data in a user-friendly way. This means that, for example, if a retail operator wants to integrate its store managers in order to achieve its energy goals, this can be accomplished by giving them read-only access to dashboards. Managers can see both their own store, and also compare their values with others, and thus assess them better. After all, a bit of competition can also ensure quality.

ESG Reporting: Challenges that Can Be Mastered

The building sector will have to take a giant step towards digitalization, transparency and energy efficiency, due to the new EU requirements. This poses challenges, especially in existing systems – challenges that can be easily solved thanks to suitable technology and cloud-based solutions. Open and scalable systems, in particular, offer users additional future-proof security and quality. There is one thing that must not be forgotten, according to Rainer Knodel, "Saving energy and making energy flows visible can be a rewarding task that is also fun."

SPECIAL TOPIC:
NEW SOLUTIONS FOR
BUILDING TECHNOLOGY

WAGO BUILDING ECOSYSTEM

Complete System for Building Automation, Management and Reporting in Modular Format

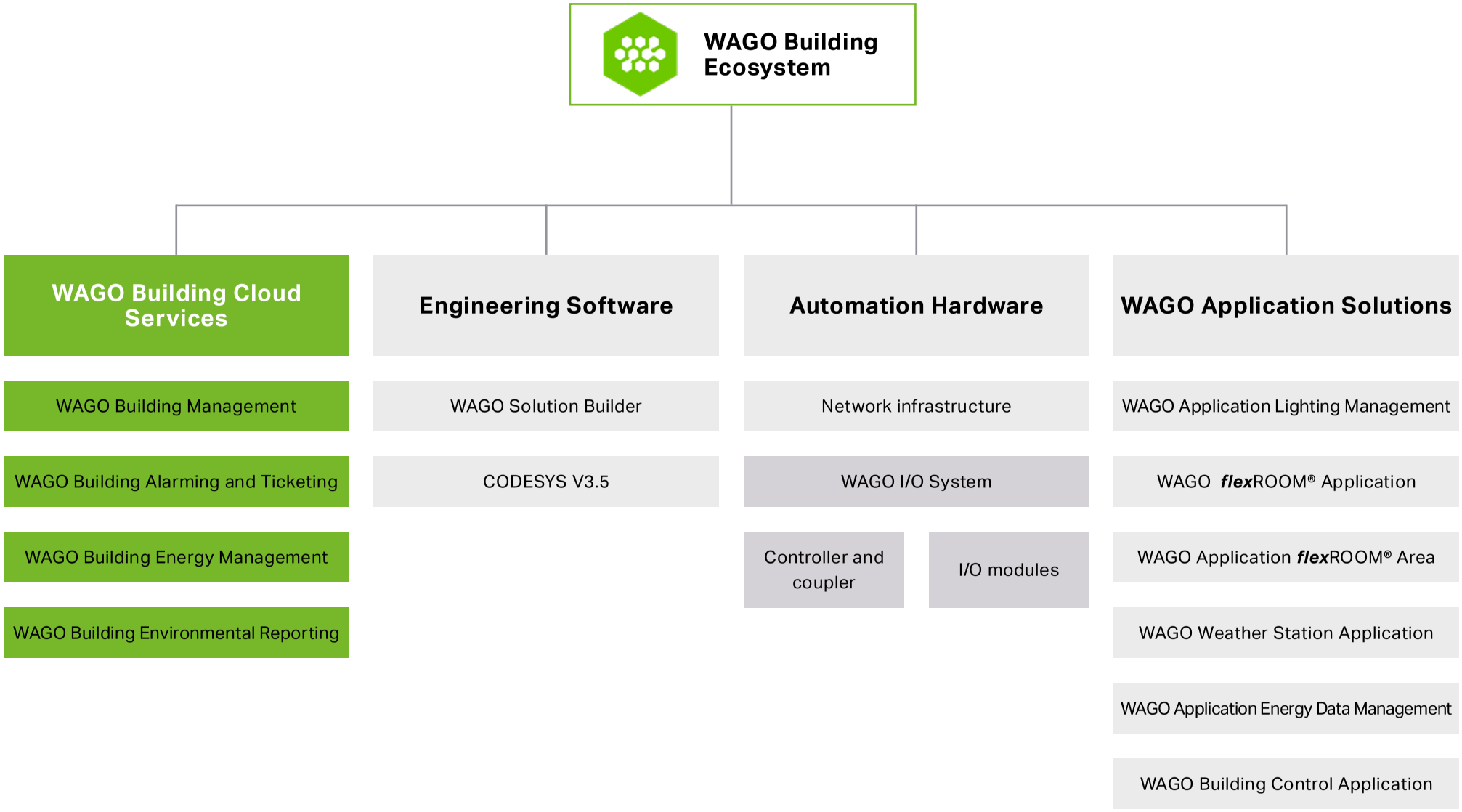
At a time when technology is having an increasing impact on our daily lives, building technology has also undergone a decisive change. The WAGO Building Ecosystem represents another important step in this development. It is an integrated system that unites and optimizes all aspects of building automation, as well as building management and reporting.

The WAGO Solution Builder forms the core of the WAGO Building Ecosystem, and the WAGO Building Cloud Services enable comprehensive control over all systems and applications. This central management and operating system (BMS) recognizes individual requirements and implements them – an important contribution to efficient building operation. In addition to these elements, the Ecosystem also includes other components, such as additional software tools and a large number of application solutions and hardware. The integration of different technologies and solutions creates a system landscape that meets the demands of modern buildings. At the same time, it meets WAGO's demand for openness and is highly scalable: individual system components can be integrated into an existing building infrastructure, or the system as a whole can also be used.

Why is the WAGO Building Ecosystem So Important?

It allows seamless interaction between all building systems and applications. Greatly increased efficiency is achieved through the integration and harmonization of different technologies and solutions. The WAGO Building Ecosystem is therefore crucial for intelligent, sustainable building technology – both in smaller projects and across larger properties.

Learn about our current new products from the building sector in the following pages.


WAGO Building Ecosystem
WAGO Building Cloud Services
WAGO Building Management
WAGO Building Alarming and Ticketing
WAGO Building Energy Management
WAGO Building Environmental Reporting
Engineering Software
WAGO Solution Builder
CODESYS V3.5
Automation Hardware
Network infrastructure
WAGO I/O System
Controller and coupler
I/O modules
WAGO Application Solutions
WAGO Application Lighting Management
WAGO flexROOM® Application
WAGO Application flexROOM® Area
WAGO Weather Station Application
WAGO Application Energy Data Management
WAGO Building Control Application

EFFICIENT BUILDING MANAGEMENT WITH WAGO BUILDING CLOUD SERVICES

FOUR NEW CLOUD-BASED SERVICES OPTIMIZE BUILDING OPERATION AND EFFICIENCY.

WAGO Building Cloud Services forms a new pillar in the WAGO Building Ecosystem, WAGO's integrated system landscape for buildings. These software applications cover various management and reporting functions that enable efficient, trouble-free building operation, and also support building operators in meeting the requirements of the German Building Energy Act (GEG) and the EU Building Directive (EPBD). The four cloud-based applications support building, energy and alarm management, as well as the generation of ESG reports.

Powerful Services

WAGO's cloud-based software solutions facilitate reliable access to all data at any time and place. Targeted monitoring and control of the building automation system is centrally secured from a single point in the cloud. Mobile devices can also access clearly assigned system parts, which simplifies operation and maintenance for service teams. The services record the status of building automation systems and report faults in real-time. Users can also create custom dashboards to visualize their data clearly and quickly. Each service also allows detailed access and rights management.

Open and Scalable

Retrofitting is also possible at any time: due to support for open and standardized protocols, such as BACnet, Modbus® or OPC-UA, WAGO Building Cloud Services are compatible with existing building automation systems. Each cloud service functions independently, or as part of the system with additional services. Since WAGO Building Cloud Services are components of the modular and scalable WAGO Building Ecosystem, additional building components can be individually added to the building's components.

Your Benefits:

- Optimal support for the legal requirements of energy management and ESG reporting (CSRD and ISO 52120) and compliance with energy efficiency class A
- Individually expandable and combinable as part of the modular WAGO Building Ecosystem
- No additional software installation required

WAGO BUILDING ENVIRONMENTAL REPORTING

EQUIPPED FOR THE ESG REQUIREMENTS

The importance of ESG reporting in the corporate world is growing steadily, even for building operators. WAGO Building Environmental Reporting is one of the core components of WAGO Building Cloud Services, which support building operators, facility managers and energy managers in making their ecological footprint transparent. It facilitates the preparation of ESG reports according to the EU CSRD directive. The cloud application combines all relevant building data from digital meters, manual readings or other systems, visualizes them and creates automated reports with just a few clicks. This provides you with the best possible preparation for future reporting requirements while constantly looking for potential optimizations.

WAGO BUILDING ENERGY MANAGEMENT

OPTIMIZATIONS REQUIRE TRANSPARENCY.

WAGO Building Energy Management provides transparency and clarity in building energy data and offers potential for optimization. Therefore, freely configurable dashboards and widgets are available to visualize energy flows and losses and calculate consumption. In addition, it supports the requirements of DIN EN ISO 50001, making it eligible for funding in Germany per BAFA.

WAGO BUILDING ALARMING AND TICKETING

EASY ALARM MANAGEMENT

By using WAGO Alarm Management, which includes an integrated ticket system, even complex alarm scenarios can be managed as easily as scheduling. Functions include support for alarm chains with a visual representation of the cover, root cause analysis, recording of the failure duration and documentation of measures.

Freely configurable dashboards provide an overview of systems, individual buildings and portfolios. The alarms offer flexible options: they can be sent out via SMS, email or push notification in a mobile app.

WAGO BUILDING MANAGEMENT

FOR TROUBLE-FREE BUILDING OPERATION

WAGO Building Management forms a higher-level, cloud-based management and operating setting. It enables monitoring of specified building technology systems and allows interventions as needed – at any time and from anywhere. Links to integrated document management can be created on system images, allowing direct access to circuit diagrams and schematic diagrams, for example.

MAJOR UPDATE FOR THE WAGO SOLUTION BUILDER

EVEN MORE EFFICIENT AND EASIER: INNOVATION FOR SOFTWARE ENGINEERING IN BUILDING PROJECTS

WAGO Solution Builder is an integrated and efficient software solution for installers and operators of building automation solutions. WAGO Solution Builder Release 2.0 further simplifies the engineering design of building projects by expanding the user-friendly wizard function, among other things. This function ensures that not just programming experts, but also users without extensive programming knowledge, can use the engineering tool effectively. This simplifies collaborative commissioning, maintenance, operation and service, especially for teams with mixed programming skills.

Using the Wizard to Automate Engineering Design: Here's How It Works

WAGO Solution Builder V2.0 offers the option of generating programs with CODESYS, and ability to generate programs according to customer requirements using the wizard. The wizard is a front-end system, filled with intelligent functions that can create completely functional programs, such as a functional heating circuit controller.

The wizard can take over complex programming tasks that run in the background, enable individual adjustments in the user interface, and automatically generate programs. Using simple question/answer templates, the wizard asks what the user wants, and then uses this information to write complete, functional program codes.

The backend of the system can be used with functions provided by WAGO, or to create your own wizards. This option is especially interesting for large companies that employ both programmers and also those responsible for performing the commissioning work. Programmers can create their own wizards with their ideas, which can then be used as complex, well-prepared programming during commissioning.

The WAGO Solution Builder supports BSI requirements for cybersecurity in building automation!

The Federal Office for Information Security (BSI) has set itself the goal of establishing information security as an integral component in the planning, implementation and operation of building automation (BA) systems, and has developed corresponding recommendations for the construction and operation of BA systems. Operators and system installers ought to implement these in their own systems. The WAGO Solution Builder perfectly supports many of these requirements, including: functions for password handling for the control devices, roll-outs for firewall settings, backup and restore functions, certificate distribution for BACnet SC, system-wide updates of firmware on the devices, rights management for users, and change history management. Therefore, many functions, which are now already taken into account on the software side, no longer need to be additional software to execute them.

Other Innovations:

Greater security: The update now also supports distributed server installations with secure SSL communication.

Certification handling with BACnet/SC: Certification handling is now automated in WAGO Solution Builder **2.0.** Certificate generation and distribution is automatically performed on all WAGO BACnet® Controllers with just a few clicks. This eliminates this complex task for the user.

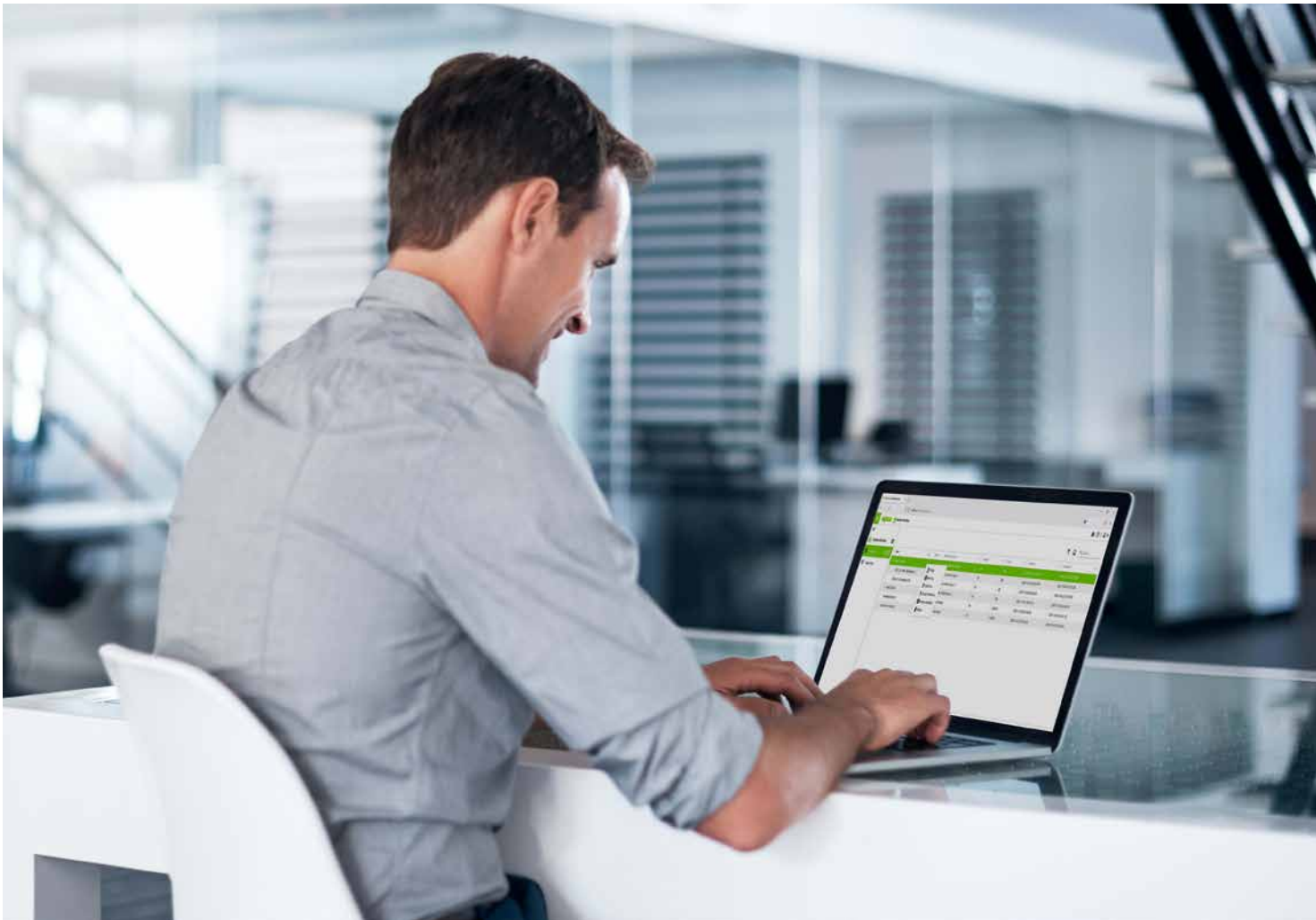
Standard applications now available in the WAGO Solution Builder V2.0: With this update, the WAGO Application ***flex***ROOM® can now be the first application solution to be commissioned in WAGO Solution Builder. This means that all the functions that WAGO Solution Builder supports can also be used in this application.

Project-related task lists: Users can create comprehensive to-do lists to track commissioning progress, as well as systematize status reports and generate them in seconds. This promotes collaboration and ensures efficient project execution.

As an engineering software program for building automation, the WAGO Solution Builder is part of the WAGO Building Ecosystem.

Your Benefits:

- Accessible to users without specific programming knowledge thanks to intelligent wizard function
- Increased engineering efficiency through automation of programming tasks
- Certificate update by the operator with the software's operator version



ESPECIALLY EASY COMMISSIONING OF SUNSHADING CONTROL

THE NEW WAGO SUNBLIND BOX (8 DI/DO) IS THE FIRST PRODUCT IN THE WAGO BUILDING ECOSYSTEM TO BE PARAMETERIZED VIA THE WAGO APP.

Efficient shading control is crucial on the facade of buildings. It is particularly beneficial for comfort and energy efficiency in large buildings, which often have number of sun protection options. The new WAGO Sunblind Box, 8 DI/DO, now helps to easily commission shade control of buildings and, in combination with control devices such as the WAGO Compact Controller 100, enables decentralized control of curtains – fast initial parameterization in the WAGO is available in app. No specific PC hardware required; simply use a mobile phone.

Easy Commissioning Due to Innovative Technology

The WAGO Sunblind Box offers hassle-free commissioning. The user enters the IP address of the device to be connected into the WAGO app once, and transfers the data to the WAGO Sunblind Box by placing their mobile phone on the box. Thanks to NFC technology, the box does not require power for parameterization. This innovative approach as well as additional predefined parameters make setting up and configuring the shading controller easier than ever.

Convenient Functions and Versatile Installation Options

With an ETHERNET-based connection (100BASE-T) via an RJ-45 connector, and control via Modbus TCP, up to four shading motors can be controlled via the four output channels (8 outputs). The box has a switch function to wire multiple boxes in a row. Equipped with WAGO's 4-pole *WINSTA*® MINI (230 V) sockets and having a height of just 30 mm, it fits in floor boxes or under suspended ceilings in a space-saving way. This allows installation near the sun-shades. The eight inputs can be freely programmed and are not logically connected to the output channels.

The WAGO Sunblind Box complements the WAGO Building Ecosystem as a room automation product.

Your Benefits:

- The WAGO app already stores the most important parameters for initial commissioning
- Straightforward application creation: an IEC module allows integration into the WAGO Solution Builder.
- Easy wiring thanks to *WINSTA*® and the switch topology in the WAGO Sunblind Box

FLEXIBLE SOLUTION FOR DISTRIBUTED PROPERTIES

BUILDING AUTOMATION WITH THE WAGO APPLICATION BUILDING CONTROL – ANOTHER MODULE IN THE WAGO BUILDING ECOSYSTEM

In distributed properties, like supermarkets, bakeries, filling stations or fast food chains, in particular, the basic functionality in building automation often repeats. At the same time, additional specialized functions are often required, depending on the size and characteristics of each store.

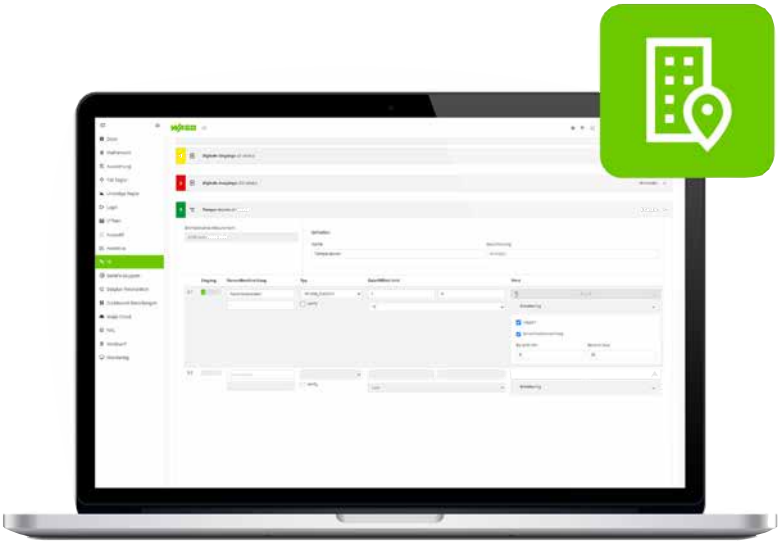
The WAGO Application Building Control offers the perfect combination of functionality, flexibility and simplicity to create and combine standard functions for room temperature control, lighting and shading, as well as other freely definable links.

Version 1.2 provides the WAGO Application Building Control with additional interfaces for integrating additional sub-bus systems, such as KNX® and MP-Bus. It also now supports the WAGO Compact Controller 100. Programming skills are not required. The software can be easily configured and commissioned. This is possible using ready-made functional units; however, the software can also be readily adapted to many different needs. It also monitors the building status. If values exceed or fall below thresholds, the application reports this to the user and visualizes it on a dashboard.

System integrators, electrical installers or facility managers can optionally connect the software to the WAGO Building Cloud Services. This gives them access to all building data worldwide. The WAGO Application Building Control is available for the PFC200, 2nd generation (item number: 750-8212) and the WAGO Compact Controller 100 (item number: 751-9301).

Your Benefits:

- Multiple interfaces for connecting different sensors and devices
- High functional safety thanks to pre-programmed and tested functional units
- Universal and flexible creation of any control and regulation functions



ROOM AUTOMATION BASED ON THE MOTTO “CONFIGURING – NOT PROGRAMMING”

WAGO APPLICATION *flex*ROOM® AREA EXPANDS THE *flex*ROOM® FAMILY

WAGO has supplemented its ***flex***ROOM® concept with the new WAGO ***flex***ROOM® Area application solution, which closes the portfolio gap for rooms and areas that are not structured according to the ***flex***ROOM® segment principle – such as corridors, restrooms, employee kitchens, printer rooms, open-plan offices, etc.

The new WAGO Application ***flex***ROOM® Area offers expanded functionalities and a higher volume structure. Up to 32 rooms/areas can be configured, and extensive pre-programmed functions for temperature control, lighting and sun shading are available.

In addition, there are numerous interfaces for connecting sensors and actuators, as well as different communication protocols for connecting to higher-level systems. Commissioning takes place using a configuration interface, following the design principle of “configuring – not programming.” This allows quick, easy, flexible adaptation of the automation to room changes without any programming.

In addition, the WAGO Application ***flex***ROOM® Area is an energy-efficient solution per ISO 52120-1, which is a transfer from DIN EN 15232 and part of the “Energy Performance of Buildings Directive” (EPBD). This supports the achievement of energy efficiency class A and certification as a sustainable green building per DGNB or LEED.

WAGO Application ***flex***ROOM® Area is another building block in the WAGO Building Ecosystem and enables a simple, efficient and flexible overall solution for modern room automation.

Your Benefits:

- Flexible room automation for non-segment-oriented rooms and areas
- Comprehensive pre-programmed functions for lighting, sun shading and indoor climate control
- Optimization of energy consumption

THE RIGHT LIGHT, AT THE RIGHT TIME, IN THE RIGHT INTENSITY

WAGO LIGHTING MANAGEMENT NOW WITH THE V2.3 BACnet INTERFACE

WAGO Lighting Management enables particularly efficient lighting control in production facilities, warehouses, shopping centers, train stations and other non-residential buildings. The lighting adapts to the needs of the specific environment.

To connect WAGO Lighting Management to higher-level management systems, such as the building control station, Version 2.3 now includes a BACnet® interface. Selected data points are mapped to BACnet® objects. These can include status and error messages, as well as switching signals and energy consumption. With WAGO Lighting Management, all relevant system information is available around the clock – and around the world.

Your Benefits:

- Flexible and scalable lighting control applications
- Connection to higher-level systems based on the non-proprietary BACnet communication protocol, which is accepted worldwide per EN ISO 16484-5
- Status and error messages, switching signals and energy consumption data can be visualized as BACnet objects

BETTER PROTECTION FOR BUILDING COMMUNICATIONS

WAGO NOW SUPPORTS THE SECURE BACNET EXTENSION BACNET/SC

Cybersecurity is an important topic for buildings, and secure, encrypted communication is indispensable. Due to the extension of the BACnet® Secure Connect (BACnet/SC) standard, one of the most commonly used communication protocols in building automation now offers an additional network layer for a secure data communication protocol.

The extension includes encryption and authentication to ensure data transmission security and prevent unauthorized access to the communication data. And WAGO Solution Builder 2.0 makes commissioning easy.

Your Benefits:

- BACnet/SC increases the security of communication in building automation.
- WAGO products now support encrypted communication via BACnet/SC.
- BACnet® offers the highest degree of interoperability in building automation and guarantees manufacturer independence.

INTERVIEW

KURT SPEELMANNS TALKS ABOUT AREAS OF INFLUENCE FOR SAVING ENERGY IN BUILDINGS

Kurt Speelmanns, whose career ranges from the basics of building installation, through technical planning, to research in construction, introduces himself as a companion in the age of energy efficiency. In this exclusive interview, he offers deep insights into his experiences and shares his assessment of the skills required and the imperative for energy conservation.

Hello Mr. Speelmanns, I'm glad you're here today.

You have both decades of experience in heating, ventilation, sanitation and construction, in the private and public sectors, and also in building automation and energy management, which you have been increasingly involved in since the 1990s. Have you found a vocation in energy management?

»I have actually spent my entire working life with the topics of building automation, building management systems, and automation operating levels. I finished my studies in 1972, and saw the first designs for building automation or building control systems in the consulting engineering office that year. Things evolved from there. In addition to this standard work, the topic of energy conservation was also discussed. It occurred to me that the people who are tasked with energy conservation are usually also responsible for operating the property. Yet, as soon as there is a "fire", for lack of a better word, there is a risk that these people will be disengaged from energy conservation, because if the heating fails, for example, you notice it immediately. If you fail to save energy, no one notices, initially.«

In other words, your plea is that energy conservation must actually be taken more seriously.

»In any case, the topic of energy conservation is very important, and I would like to make the case for at least observing the current state of a building. My experience is that 10 percent can always be saved. And there are studies that even up to 40 percent energy savings can be achieved. However, the amount that can actually be saved can't be inferred from a few key figures or by comparing one building with another. On the one hand, this is due to the fact that all buildings are unique, and on the other, that their users have different needs. So you always need a detailed actual state of your own building. The savings then result from checking and adapting all of the settings (setpoints, operating times, etc.), and the effectiveness of these measures can then be read from the before and after comparison using the energy meters, which we hope are available.«

With all the technology that exists today, one might think that energy conservation must be easier than before.

»Unfortunately, that is not the case. While energy consumption is lower today than it was 20 years ago, the percentage of potential energy savings has increased. This is primarily due to the fact that it has become more complex to recognize them. In addition, demands and expectations have risen, because energy conservation has become a basic requirement. You have to prove that you build in an energy-saving way, you have to follow regulations and operate the reporting system. That's one point. The second is that the shortage of skilled labor is also noticeable in our sector and, as I said, people who are well-versed in the subject matter can also find employment elsewhere.

The third point, which makes discovering potential energy savings more difficult than before, is modern

energy-optimized buildings. It much harder to discover potential there than in an older building, where you can tell by laying your hand on the equipment that the heating system is working at temperatures that are too high. Today, in highly insulated buildings with smaller heating surfaces, higher levels of automation and low-temperature technology, it is more difficult to discover potential energy savings. This necessitates suitable measuring devices and access to historical data from automation technology.«

Is the energy conservation effort worthwhile for building operators?

»My insight is that even if only 10% of the costs for energy and media are saved by the people assigned to them, that will still be in excess of the personnel costs. The general rule of thumb is roughly that hiring appropriate personnel at 7.5 percent of the energy costs will save at least 10 percent of the energy costs. The prerequisite is, however, that these employees only work on energy conservation and are not simultaneously employed to also work elsewhere. Ideally, these persons should be completely separated from normal building operation, because otherwise, the previously described task shifts will occur very quickly.«

What do you propose in order to address these challenges?

»First of all, as I said before, the energy officer must be separated from normal building operation so that this person remains independent and their efforts are not diverted to other tasks. The most important thing would then be

Kurt Speelmanns' career includes both managing construction projects and co-organizing BMS user conferences, and also significant collaboration in standards committees such as ISO 50001, DIN 185999 and DIN 18386. As Head of Unit at the Federal Institute for Building, Urban and Room Research, he actively contributed to the Future Construction research initiative, while his expertise in building technology, building automation, technical building management, as well as energy management and energy conservation, makes him a sought-after expert in the sector.

to structure this area of responsibility, assign staff fixed tasks and allow them to be consistently processed. This ensures that all areas of energy use are considered, and it does not devolve into doing what the people involved like best.«

Are there different areas of influence for energy savings?

»I would like to elaborate a little further on this. There are four broad categories to consider when conserving energy. First, the "investment measures" form the foundation. This is a large block of activities, which can include window replacements, improvements in insulation, or replacing a heating or ventilation system, for example. Then there is the category that involves "influencing user behav-

iors". These are addressed to building users, so that they switch off the lights when they leave the office, for example, or switch off the PC in the evening. This is followed by the large group of activities that provides the greatest effect during ongoing operations: these are the "low-investment measures". That is, the energy savings that can be achieved by properly operating and adjusting the technical systems. I'd like to say a little more about that later.

And then there is the fourth block. These are the "rebound effects", which usually involve comfort, higher performance or luxury. They cancel out some achieved savings and efficiency gains because – as always – user demands have increased. Examples include: larger rooms, higher room temperatures in winter, air-conditioning in summer or more powerful PCs. This list can be continued at will, and this is usually the reason that, following renovations, the energy consumption level has not been lowered as it should have been expected.

For the person responsible for energy conservation, it should be noted that various authorities are responsible for each area, in connection with these blocks. This generally includes the building department, management, facilities management, or the executive board of a company.

In addition to these four blocks, it should also be noted that energy conservation logically begins before use. If a building has only just been constructed, or if a new device or machine has been newly purchased or replaced 1:1, then the energy manager can only limit the damage. In other words, the energy conservation manager should be involved in all investments from the very beginning. This applies to new construction and retrofittings, and also to all purchases or replacements of devices that require energy. This person should then ensure that the systems are optimally dimensioned, adjusted and operated. This also includes extensive instruction of the operating personnel on correct and energy-efficient operation.«

You have just said that the low-investment measures will have the greatest impact during ongoing operations. To what extent?

»The term "low-investment measures" speaks for itself: little money is spent on the material and it primarily concerns personnel costs. All the other measures for which money is needed are capital investments. In other words, replacing a pump would no longer be low investment. These involve adjusting settings and operating times and adapting them to actual and current requirements. In addition, unused consumers are switched off. This alone can generally reduce energy consumption by at least 10 percent. You can find this in the literature, as already mentioned, as well as significantly higher numbers.«

How can low-investment energy savings potentials be identified and exploited?

»The management and operating level (BMS) of a building automation system is the essential tool for this. Based on historical data, an experienced energy saver can quickly determine, in conjunction with the current operating states, whether the systems are adjusted correctly or whether supply losses or potential waste can be avoided. The settings should then be changed and documented, together with the operating personnel.

The tasks of an energy manager then naturally also include evaluating the consumption values for energy and media. They must be checked regularly for changes. Furthermore, the energy officer should also check the technical systems at regular intervals. This is also carried out by the operating personnel, but the energy officer looks at the systems from a different perspective and can tell from this point of view whether sensible savings can be generated.«

Regular intervals: What do you recommend?

»This depends on the size of the buildings and their energy use in relation to the associated personnel costs for energy conservation. From experience I can say that large properties should be examined about every quarter and a single-family house about every five years. It must be taken into account that exploiting low-investment savings potentials is an on-going task. Once settings have been optimized, they are not permanent, because operations always change, or setpoints are adjusted, intentionally or accidentally. It is often also the case that a system or a system part goes into manual mode in connection with a fault, or out of convenience, and someone then forgets to enable automatic mode again.«

This also means that the greatest need for action is in non-residential buildings – especially in larger properties. How high do you estimate the staffing requirements should be for energy management?

»This is derived from the costs for energy and consumables. My research on this subject yielded the following

rule of thumb: If you invest 7.5 percent of the costs in the personnel, you will save at least 10 percent. Note that this is a conservative value, as the savings are usually higher.«

What advice would you give to operators of smaller properties?

»For example, if we start at 1 million € per year for energy and consumables, then €75,000 would be available for staff. This would gain you an employee who would focus on energy savings throughout the year. For smaller properties – and this will be the majority – the budget is correspondingly smaller, which is then not enough for an entire position. In this case, there is no alternative but to delegate this job to a person who also performs other tasks. Apart from the fact that this creates the conflict that has already been explained, it is also very likely that employee competence for energy conservation measures is also lower.

To be efficient in these cases, external support should be obtained, in order to carry out a comprehensive initial survey to be available later, during ongoing operations, for more complex questions. It is important that this support is set up for the long term, as a good result will require comprehensive knowledge of the systems, the respective operating processes and all user-specific requirements. However, you only gain this experience by engaging with the object for a correspondingly long time.«

In practice, we often see that different stages in the building life cycle are overseen by different people or companies. For example, the planning of a building is often carried out by one company, with handover and/or commissioning undertaken by another. Can this lead to problems with energy conservation measures?

»Yes, definitely. Therefore, the first step is for the energy officer to monitor these processes from the beginning and ensure that the subsequent use of the building is taken into account during planning and construction. This ensures that operating personnel who arrive later are not confronted with surprises, which can usually only be remedied by capital investments and protracted measures. One result is that the commissioning process, which sometimes takes several years, can be significantly shortened.«

Now, as you mentioned earlier, the shortage of skilled labor is a very pressing challenge in the construction industry as well. In particular in the context of energy conservation, which entails countless measurements and sometimes also a jungle of data, all of which must somehow ultimately be managed. How can the industry circumvent this and tackle the problem as a whole?

»This is indeed the case, and what is currently happening in the sector has already assumed cannibalistic traits. Even so, in order to achieve good results, I can see three possibilities. First of all, it must be ensured that the existing staff is employed according to their respective qualifications. Conserving energy is a task that requires a lot of experience, so highly qualified employees should not be saddled with tasks that others could also be doing. The second is to provide the requisite tools, so that parts of the tasks can also be performed by people with less expertise and less experience. One example would be the application of the expert system developed by the University of Stuttgart (1).

As a third measure, it is advisable to design the technology to be simpler and less complex for future investments. The systems then become more transparent, and errors and malfunctions can be more easily identified.«

What expectations do you have regarding the use of AI in the building sector in the coming years?

»In the building sector, I see more of a long-term development. On the one hand, there is not as much money available for the further development of AI as there is to solve large societal challenges. The other is the extreme variety in building stock and the variations in building usage. This makes it almost impossible for self-learning AI systems to find universal algorithms, e.g., to search for malfunctions. For example, one study by the Fraunhofer Institute for Intelligent Analysis and Information Systems a few years ago analyzed the complete historical records of all data points from two building management systems across two years. It turned out that it is almost impossible to even identify something as obvious as a swinging control loop. In the event of an error, the amplitudes, the frequency and the disturbance variables that may still override the control process were too different.«

Have you already given up on this?

»No, we won't do that either, and AI will arrive soon enough. However, it will only be small steps at first, and it will take a little longer than in other areas. However, if you look at the advances that are being made in data processing, then this technology cannot be stopped and is urgently needed. In order to promote this and stimulate this discussion in the sector, an appropriate portion of the next BMS user conferences (2) will be devoted to AI in this context.«

As a concluding piece of advice, what would you pass on to all of the readers who are currently engaged with the topic of energy conservation?

»I strongly recommend that you consider energy conservation as an essential and strategic measure. Observe carefully what is happening in your building and take the time to get a detailed, current picture. Potential energy savings are always available, but their discovery requires a targeted and consistent approach. Clearly separate the energy officer's assignments from standard building operations to ensure independence. Structure the work processes and set priorities to implement, not only what appears to be useful to the employees, but also that which is truly effective. Pay particular attention to the low-investment measures, which have the greatest influence during ongoing operations.«

Mr. Speelmanns, thank you for the conversation!

(1) Expert system for identifying and defining low-investment measures to reduce energy sales and pollutant emissions in existing buildings - EXECO2, free download at: www.zukunftbau.de/projekte/forschungsfoerderung/1008187-0946
(2) The BMS user conference is a leading event on current management and operating level topics in the German-speaking world: http://glt-anwendertagung.de

OPINION

BUILDINGS WERE UNDER-ESTIMATED IN THE DISCUSSION ABOUT THE ENERGY TRANSITION – UNTIL NOW

Energy is the topic of the day. How can we generate energy sustainably? How can we use energy more efficiently? How can we become energy-resilient? These questions have been asked for some time now, but they have never been as pressing as they are now. The energy transition and the search for alternatives to the status quo have received a tremendous boost in recent years – especially in the building sector. Making buildings more sustainable and more independent of fossil fuels has gained political and social urgency. We want to use this as an opportunity to finally advance smart grids and energy-autonomous buildings. The necessity for this is here – as is the technology.

An Awakening of Society and Politics?

Efforts to make the building sector more climate neutral have been underway for some time at the EU level. One EU building directive, the EPBD (Energy Performance of Buildings Directive), in effect since February 2018, stipulates concrete specifications and measures for energy-efficient design in the building sector for member states. This directive should have been converted into national law in Germany by 2020 at the latest. As of yet, this has not yet been accomplished in its full scope, even with the German GEG (Building Energy Act). The EPBD is currently under revision at the EU level, where measures are being defined and limits adjusted downward where required.

In 2022, the Federal Ministry for Housing, Urban Development and Building (BMWSB) and the Federal Ministry for Economy and Climate Protection (BMWK) introduced the emergency program for climate protection in the building sector – and admitted that the plan for implementation had fallen short of its goals. Also in 2022, the building sector failed again to achieve its climate targets by 4 million tons of CO2. The ministries are now planning to more urgently address existing buildings in particular, and to vigorously rework their plans to include a combination of support and regulation – something that WAGO considers to be way overdue, as financial incentives are always required to bring about rapid and profound changes.

Increased Alternative Energy, Reduced Energy Demand

Special focus is placed here on heating. We welcome this at WAGO. **This is because the largest proportion of the energy consumed in buildings is used for space heating, which is precisely where much can be achieved with today's technology** – without sacrificing the comfort of warm rooms. On the one hand, this requires the expansion of alternative energies, while on the other, new ways of generally reducing energy consumption must be identified.

Solutions for demand-oriented and efficient use of energy have been under development for decades in the building sector in particular (especially in non-residential buildings) – simply for economic reasons alone. Intelligent automation technology is a key factor in exploiting energy potentials. We at WAGO are therefore continuously developing our solution offerings in building automation under the slogan "Green buildings are smart buildings". Indoor climate, lighting management, building and real estate management are just a few of the keywords for this.

We have the technology; but actually implementing a "wave of renovation" is not at all easy when you consider that this

transformation must be carried out in light of full employment and in a time when there is a shortage of specialists. To tackle this challenge we have made it our duty to propose comprehensive solutions for the building market that are made possible by high-quality, reliable WAGO technology and that are easy to use and implement.

Plug and Play Gains in Interest.

Plug and play solutions simplify implementation, as they can be configured without a great deal of effort, when they are well planned. We see this in building installations, where installation work packages are duplicated and continued, using identical or similar patterns, like a typecase box, throughout gradual renovations and modular construction (incidentally, also a point that was emphasized at the 2022 press conference on the emergency building program for future construction projects). This saves planning effort and expense, minimizes interface management, reduces complexity and enhances efficiency.

Our *WINSTA®* plug and play installations support this with standardized and standard-compliant plug-in cable connections for application-oriented implementation in buildings. WAGO also offers complementary plug and play solutions in building automation under the slogan: Configuration instead of programming. Our WAGO Solution Builder software (see also p. 24) with its intuitive user prompting and ready-to-use application modules and preferred solutions (such as for lighting management, room automation, building management, etc.) supports specialized electrical companies, building planners and entire enterprises in "building smarter" – a universal key to smart retrofitting of the myriad of existing buildings in Germany to transform them into energy-efficient structures.

Dr. Heiner Lang, WAGO CEO

CONSTRUCTION CONCEPT WITH A FUTURE:

MODULAR CONSTRUCTION WITH PLUGGABLE BUILDING INSTALLATIONS

What Is Modular Construction?

Flexibility and adaptability are crucial in construction. Modular construction perfectly supports these requirements. Buildings are constructed from prefabricated, usually standardized components, so-called modules, which are produced in a controlled manner and mounted on the construction site in a modular manner to form a complete building. This trend-setting construction method offers many advantages: faster, on-time construction, lower, predictable costs, consistent manufacturing conditions, less waste on the construction site and a very high degree of flexibility in the subsequent building life cycle. The efficient use of resources also minimizes environmental impacts, which in turn promotes sustainable construction.

The Advantages of Modular Construction:

Time and cost savings: Preliminary planning and production of components in a controlled environment can significantly reduce construction times and costs.

Flexibility and adaptability: Modular buildings are easily expandable and adaptable to meet changing needs and demands.

Sustainability: The efficient use of materials and resources, as well as the possibility of reuse and recycling, make modular construction an environmentally friendly and economically sustainable option.

Modular construction is used in various construction projects – from residential buildings, to office buildings, up to educational institutions. This construction method becomes especially attractive when the completed modules are standardized in series production. This is also called “serial construction”.

Pluggable Building Installation – Key Components in Modular Construction

Pluggable electrical installations, often known as a plug and play systems, play a crucial role in modular construction: they must also be well planned in advance and pre-assembled at the factory in order to be simply plugged together at the construction site. This efficiency and flexibility enable an easy connection of components, reduce downtimes on the construction site and significantly accelerate the construction process. Subsequent changes can also be easily implemented, making pluggable building installations an ideal and cost-effective alternative for modular construction projects.

The entire electrical system of the wooden, modular building is connected via the WAGO *WINSTA*® Pluggable Connection System, which is protected against mismating.

EXAMPLE PROJECT

MODULAR CONSTRUCTION ENABLES TEMPORARY BUILDINGS

Blumer Lehmann AG from Gossau (CH) proves how versatile wood can be as a building material. If it is then combined with clever connection technology, then nothing can stand in the way of the temporary, modular school building.

The idea behind modular buildings in wood construction is quickly explained. Since these are produced with a prefabrication degree of up to 90 percent, subsequent construction times on site are reduced to a minimum, which reduces the impact on nearby residents. In addition, this type of construction can be easily dismantled after a certain period of use and reused at a different location.

Blumer Lehmann AG demonstrated how easy and, above all, how fast this can be carried out at the Sankt Karli Volksschule in Lucerne. Because this school is to be renovated in the coming years, and instruction without interruptions would be impossible, the school administrators rented a temporary building for this time period. While the individual modules required 90 trucks for their transportation, the skilled technicians needed only two weeks to assemble them.

The resulting timber construction extends over three floors and provides eight classrooms per floor, as well as additional rooms for the teachers, the administration, and the caretaker, among others.

WINSTA® Eliminates Rewiring

Because the temporary construction has already been rented out for the next twenty years, and during this time will be moved to four additional locations that need to alleviate spatial shortfalls, the WAGO *WINSTA*® Pluggable Connection System will initially be used. "Later, we simply pull the plug and plug it back in at the new location," according to Aleksandr Smurov from A. Lehmann Elektro AG from Gossau, which carries out electrical engineering design and installation work for Blumer Lehmann AG, among others.

Although this sounds a bit oversimplified, it has specific, practical benefits. As the project manager and qualified electrical installer explains, "Otherwise, it would be quite expensive, because we would have to lay the electrical cables again and then relabel them."

Blumer Lehmann also relies on a principle, similar to that of the electrical installations, for the supply lines for water and heating. "The expense is somewhat greater there, however, because you can't just plug in," explains Smurov. The fitters bypass the junctions with sleeves to ensure that water flows from the faucet and into the heating element. This also does not require initial drilling on site and time-consuming installation.

Remote Control of Weather Sensors

In order to ensure that the temporary buildings from Blumer Lehmann are available as quickly as possible, the prefabrication will take place in Gossau. The basic structures of the modules are moved by rail from station to station, and the individual elements are assembled using a crane. As soon as the actual room is set up, heating engineers, plumbers, painters and electricians carry out as much preliminary work as possible.

The latter lays the cables for lights, blinds, motion detectors, distribution boxes, sockets and switches all the way to the distribution box. The connection is carried out using *WINSTA*® Pluggable Connection System, which is protected against mismating, and also links in a module for remote access. The temporary school building has weather sensors that control the sun shades, providing light in winter and shade in summer. If the building is later used at another location as an interim structure, it will be easy to communicate remotely to the weather sensors that the orientation has now changed. A technician, who would handle this on site, is no longer needed.

»WITHOUT *WINSTA*®, WE WOULD HAVE TO REWIRE AND RELABEL IT.«

Aleksandr Smurov,
Modular Construction Project Manager

Project Partner

Blumer Lehmann AG
Blumer Lehmann AG, headquartered in Switzerland, is a leader in the timber industry and in timber construction. One of the company's focal points is modular timber construction, for which they provide international support, from design to assembly.

www.blumer-lehmann.com

A. Lehmann Elektro AG
Lehmann Elektro AG is a premier Swiss company specializing in building technology, IT and telecommunications.

www.lehmann.ch

St. Karli elementary school in Lucerne employs a temporary wooden building to deal with the renovation of the existing school building. The construction of the temporary building took just ten days.

The Benefits in Detail:

- The *WINSTA*® Pluggable Connection System achieves a prefabrication level of up to 90 percent. This minimizes on-site emissions.
- With the *WINSTA*® pluggable connection system, the modular installations can be easily disassembled and reinstalled at another location, as cabling and labeling expenses are eliminated.

When outsourcing the electrical installation, which the Migros Aare markets also use during store renovations, an electrician pre-assembles the cables outside of the construction site, so that they have to be plugged in later.

WAGO *WINSTA*® PLUGGABLE CONNECTION SYSTEM

PLUGGABLE CONNECTORS ACCELERATE ELECTRICAL INSTALLATION

In some cases, the time schedules for individual building systems at construction sites can be very short. However, far-sighted companies know how to deal with these pressures – by outsourcing the electrical installation! This method has also successfully used in renovations of the Migros Aare markets.

Building contractors will list various arguments for their tight timetables. However, regardless of building trade, this places large demands on the skilled trades companies. That is, in order to be able to carry out their work within the specified time limit, they must either draw down employees from other construction sites or arrange for overtime. Neither is ideal. While the first option leaves work unfinished at other construction sites and employees end up interfering with each other's work, the second one leads, sooner or later, to dissatisfaction among the workforce.

So how can this Gordian knot be untied? Interestingly, the answer to this question is already known on the customer side. "We rely on pre-assembled components, so that as much as possible can be simply plugged in and not much work needs to be done in our stores," says Patrick Renfer from Migros Aare. The manager for Construction, Technology & Interior Design also reveals why their renovations have to be completed fast: every day that a store stays closed increases the potential for customer exodus. Therefore, every effort is made to keep the closing times as short as possible.

Plugging In Is Cheaper Than Wiring

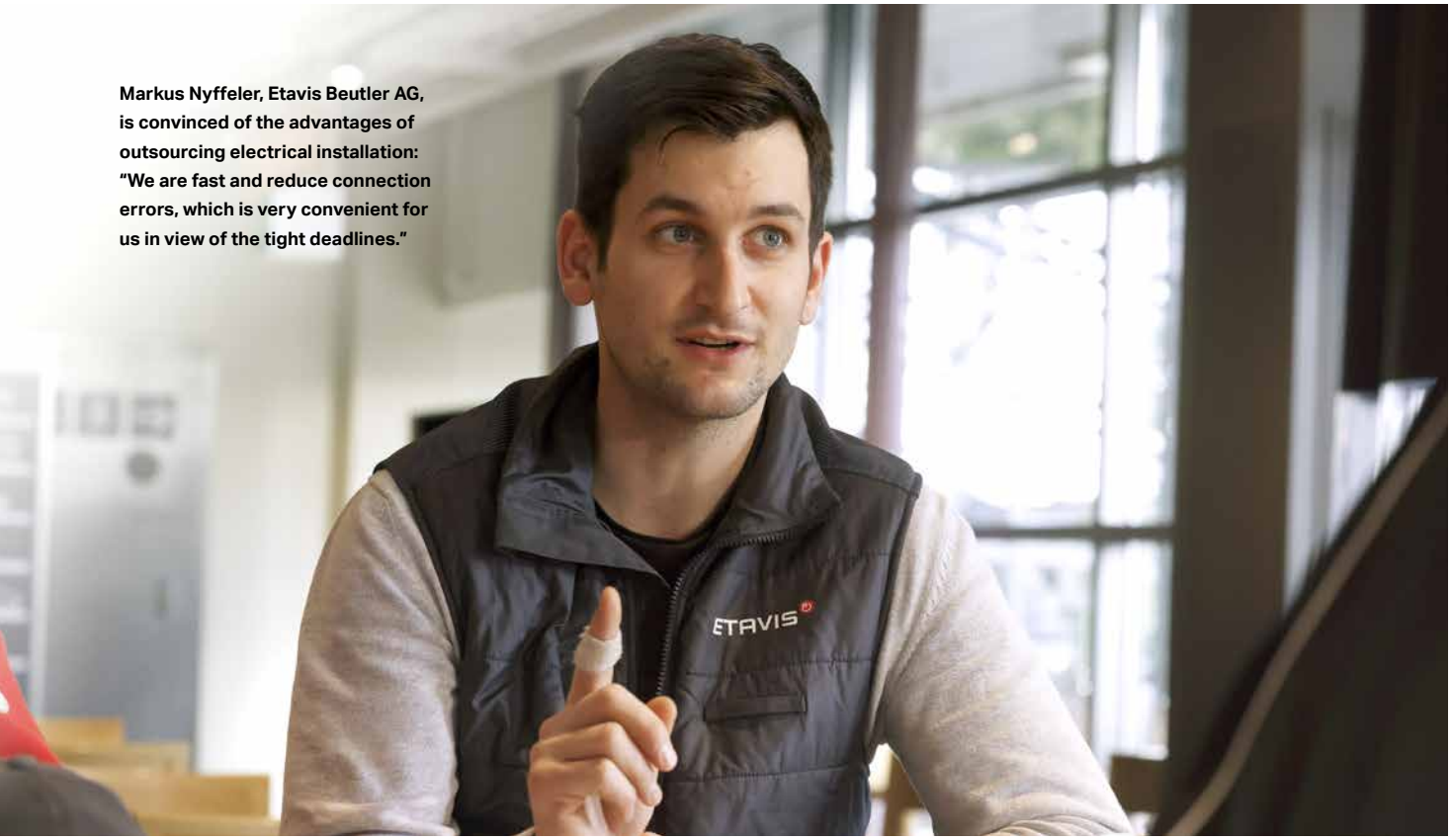
The WAGO *WINSTA*® Pluggable Connection System is an established solution that keeps closing times short for Migros Aare. "This allows us to speed up work processes and open up time slots for other building systems during renovations," explains Renfer. The mandatory use of the plug-in installa-

tion, which is protected against mismating, is carried out in close consultation with the electrical designer.

Christoph Köchli from the renowned HHM Group, which operates throughout Switzerland, is one of the electrical engineers responsible. He has dealt extensively with the WAGO solution and was quickly convinced of its advantages. “At first, we were also asked if this would make the installations too expensive,” he says, recalling the evaluation process. Then adds, “The overall calculation showed that pluggable installation is not only cheaper, it offers more advantages.”

No Connection Errors or Lost Tools

Markus Nyffeler from Etavis Beutler AG explains the specific advantages of outsourcing electrical installations. “We prepare them at our work table, and all we have to do later on at the construction site is plug the installation together.



Markus Nyffeler, Etavis Beutler AG, is convinced of the advantages of outsourcing electrical installation: "We are fast and reduce connection errors, which is very convenient for us in view of the tight deadlines."

Project Partner

Migros Aare
Migros Aare is one of ten cooperatives of Migros – one of the largest retail companies in Switzerland. The Migros-Genossenschaftsbund has other subsidiaries and holdings, including supermarkets, shopping centers, specialist stores and production facilities.

www.migros.ch

HHM Group (Hefti. Hess. Martignoni.)
The HHM Group, headquartered in Switzerland, is an independent engineering company that offers services in overall building technology planning, HVAC and electrical engineering for building construction and infrastructure.

www.hhm.ch

Etavis Beutler AG
Etavis Beutler AG, also headquartered in Switzerland, is a specialist company for demanding and sustainable electrical solutions. The portfolio ranges from electrical installations, to building automation, to energy efficiency and project management.

www.etavis.ch

This allows us to be fast and reduces connection errors, which is very convenient for us given the tight time frames," says the project manager.

Although he admits that the preconfection requires more time, in comparison to conventional installation, this is quickly compensated for afterwards. In addition, cable assembly at the work table is more comfortable than stripping and wiring conductors overhead while standing on a ladder. Furthermore, since plugging in requires no tools, the cable runs do not inadvertently contain screwdrivers, wire strippers or other tools that would have to be expensive to repurchase. Another time-saving effect is provided by the test sockets integrated into *WINSTA®*. These allow for installation testing in the plugged-in state – nothing is easier.

Flexible during Product Changeovers

But how does the electrician understand, when the pluggable connection system is practically mandated in the specifications? After all, electricians lose working hours when using *WINSTA®*, which can't be offset. "In fact, this is the biggest worry," says Christoph Köchli from HHM. Nevertheless, he is convinced that electricians can only win with *WINSTA®*: "It allows them to work efficiently and sustainably, which is why they need less overtime or weekend work." Against the background of the growing shortage of skilled labor, he considers this an important argument.

»WITH *WINSTA®*, WE ARE VERY FAST AND REDUCE CONNECTION ERRORS.«

Markus Nyffeler, Etavis Beutler AG

The pluggable connection system is efficient and sustainable, and not just during installations. "Our facility management system benefits from *WINSTA®* in many respects," assures Renfer from Migros Aare. This simplifies troubleshooting for service personnel, and also allows quick and easy adjustments in the stores. "If there is a change in products, we can't wait until the next regular modification date; instead, we want to implement these quickly," he says, concluding, "small changes can only be implemented quickly and flexibly with pre-assembled solutions, such as *WINSTA®*."

The Benefits in Detail:

- Cable assembly when standing instead of overhead
- Large time savings at the construction site, since the installation only needs to be plugged in
- Test sockets in *WINSTA®* allow installation testing when plugged in.

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