DREES & SOMMER

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A PASSION FOR PROPERTIES

Refurbishing.
Revitalizing.
Transforming.

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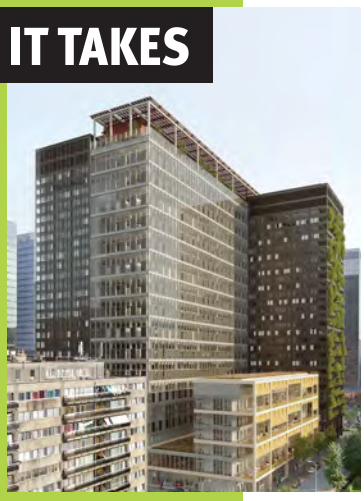

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FOREWORD

A PASSION FOR PROPERTIES – REFURBISHING. REVITALIZING. TRANSFORMING.

Thomas Harlfinger,
Prof. Dr. Dipl.-Ing. Bau, real estate economist (IRE|BS), MRICS, Partner

Dear reader,

How do you imagine the future? If the question brings a frown to your face, don't worry: We're not trying to sell you life insurance or retirement planning. We are simply interested in what comes to mind when you imagine what the real estate of the future will look like. And whether your idea of the future has changed.

When thinking about sustainable real estate projects, many people imagine futuristic buildings. So do we: We often support the development, planning and construction of such new buildings and do everything in our power to ensure that these buildings hold great promise for the future.

But when we look at legacy buildings, we see buildings that can – with the help of targeted measures – be made fit for tomorrow, or more precisely, fit for a future worth living in.

Refurbishment has become more prevalent recently, and not without good reason – it is closely linked to the key goals and challenges of our time: Climate neutrality, resource conservation and waste avoidance. The construction and real estate industry can – and indeed must – make a huge contribution to ensuring that we cut carbon emissions, use raw materials more wisely, and convince more people of the benefits of the circular economy. And how do we achieve this? By having more faith in what we can do with legacy buildings. And by recognizing the opportunities offered by refurbishment, revitalization and transformation.

This dossier is dedicated to exemplary projects of this kind and to the people behind them who are leading the way by demonstrating just what can be done. We present examples of portfolio owners who, for different reasons and with different goals, have decided to modernize their buildings instead of simply building new ones. And who have been motivated by economic reasons as much as by ecological concerns.

We have divided our new dossier into three parts: Strategic consulting, feasibility studies, and implementation. This allows us to cover the widest possible range of topics encountered in the course of a (re)construction project. And we show what can be achieved in the short term simply by working together.

We hope that these stories will provide inspiration for your own projects.

Sincerely,

Thomas Harlfinger

A key factor in the transition to a climate-neutral future is the reduction of carbon emissions from operations. This applies to residential and commercial buildings, industrial real estate, and even to larger facilities such as the winter sports arena in Oberhof, Thuringia. A second factor is the sparing use of resources. The construction industry produces more waste than any other sector. But that can be changed – with the help of an intelligent approach to the reuse and reprocessing of embedded building materials. The following examples show what it takes.

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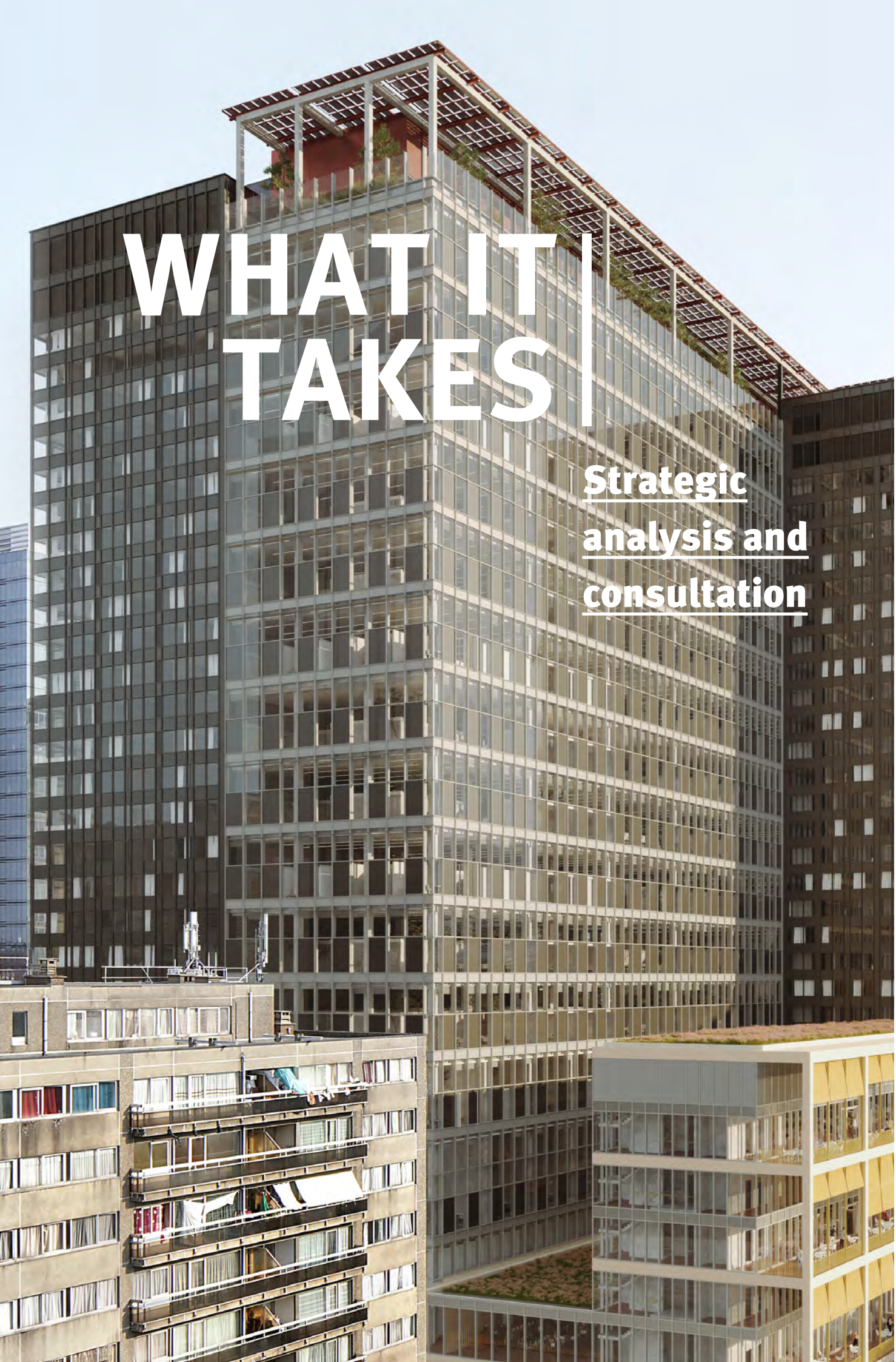
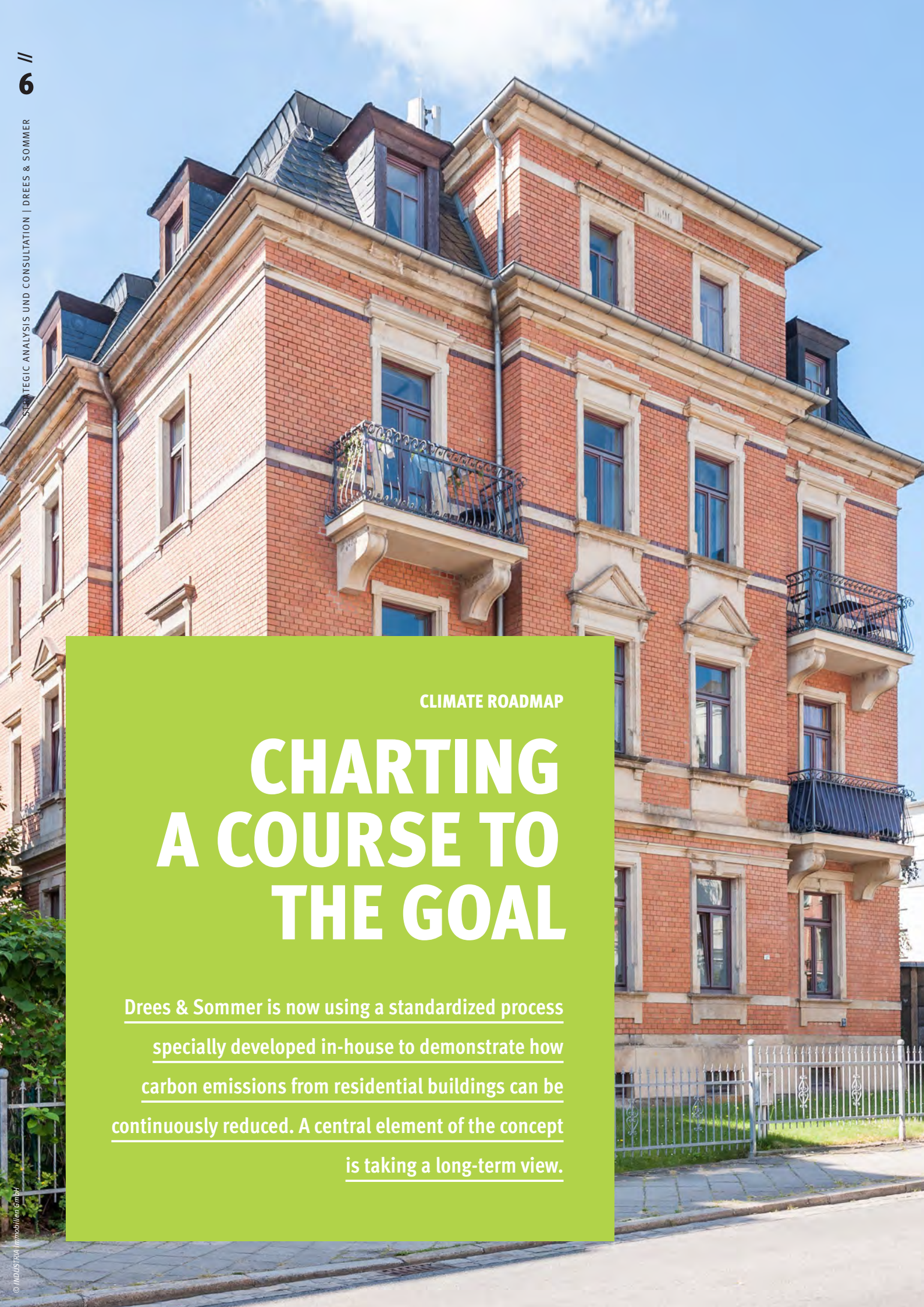


WHAT IT TAKES

Strategic analysis and consultation



CLIMATE ROADMAP

CHARTING A COURSE TO THE GOAL

Drees & Sommer is now using a standardized process specially developed in-house to demonstrate how carbon emissions from residential buildings can be continuously reduced. A central element of the concept is taking a long-term view.

Those of us who are a little older will remember A to Z guides and road maps. These were the huge books or sheets that had to be carefully leafed through or unfolded, under time pressure in the passenger seat of a moving car or lost and confused surrounded by a breathtaking mountain landscape. Sooner or later, you managed to figure out which way to go. It was not easy at times, particularly if the journey wasn't the destination.

In the age of online navigation systems and GPS, maps have become the preserve of dedicated enthusiasts. Because make no mistake: maps still exist. Drees & Sommer has also developed one. Although it is fully digital and much easier to manage, it is still extremely handy, as it shows quite clearly the path you have to take. Its goal is to reduce carbon emissions from established buildings to near-zero by 2050.

Mastering complexity

If Germany wants to achieve its ambitious climate protection goals over the next two and a half decades, there is no way around renovating established residential buildings. They account for about 35 percent of carbon emissions from the building sector – and houses built before 1979 emit a particularly large amount of carbon dioxide. But general refurbishment is often out of the question – it is simply too expensive.

Progressive renovation represents a more realistic approach – and also makes sense, as long as the individual measures spread over a longer period of time are properly coordinated. And that's not as easy as it sounds. Moritz-Andreas Decker, an expert in climate neutrality and energy management at Drees & Sommer, calls it a 'highly complex computational and optimization task'. This is all the more true if the project involves making not just one building environmentally friendly, but an entire real estate portfolio with many different types of property.

Frankfurt-based Industria Wohnen GmbH, which manages 18,700 apartments across Germany, was facing such a challenge when it heard about Drees & Sommer and its newly developed climate roadmap. The company wanted to proactively align two of its special funds with international climate protection goals. "Real estate isn't just about generating returns. It is also about meeting environmental, social and architectural requirements. We know that real estate investments also involve social responsibility," says Jens Grathwol, Head of Fund Management at Industria Wohnen.

Grathwol is alluding to the three key elements behind the climate roadmap, namely ecology, economy and social aspects. Because the goal is not merely to reduce emissions to near-zero and achieve a favorable balance between costs and revenues for portfolio owners, but also to reduce heating costs for tenants. Industria Wohnen now knows how to manage this tightrope walk into the future.

Four steps to map creation
A climate roadmap is developed in four steps using a standardized procedure with continuous monitoring. First, the experts at Drees & Sommer determine the basic criteria. This is followed by analysis of the existing portfolio, including the various building types and the organizational, economic and technical conditions. The experts then weigh up various measures and, in the final step, develop a suitable strategy for the future.

The climate roadmap claims to lead ultimately to greater resilience to political and energy-sector developments, such as rising carbon prices. The trickiest part is planning the right measures at the right time and coordinating them. For example, when dimensioning an environmentally friendly heating system, the subsequent facade renovation should be taken into account, thus resulting in an optimally coordinated combination of building systems equipment and building envelope.

This may mean temporarily supplementing a new heat pump with a second, less expensive heating system until the improved insulation makes it superfluous. This is where the far-sightedness comes into play, allowing the climate roadmap to avoid expensive conversions and lock-in effects. All in all, investments pay off from an economic perspective, as Jörg Schlenger a Drees & Sommer expert for decarbonization and energy optimization, promises: “The climate roadmap ensures operational savings – and preserves the value of real estate.”

The energy efficiency and environmental compatibility of a building play a key role in the property’s value. On the virtual road map with a timeline extending to 2050, the curve for carbon emissions with the climate roadmap arcs quickly and steadily downwards.

Ecology, economy and social aspects are the key elements behind the climate roadmap.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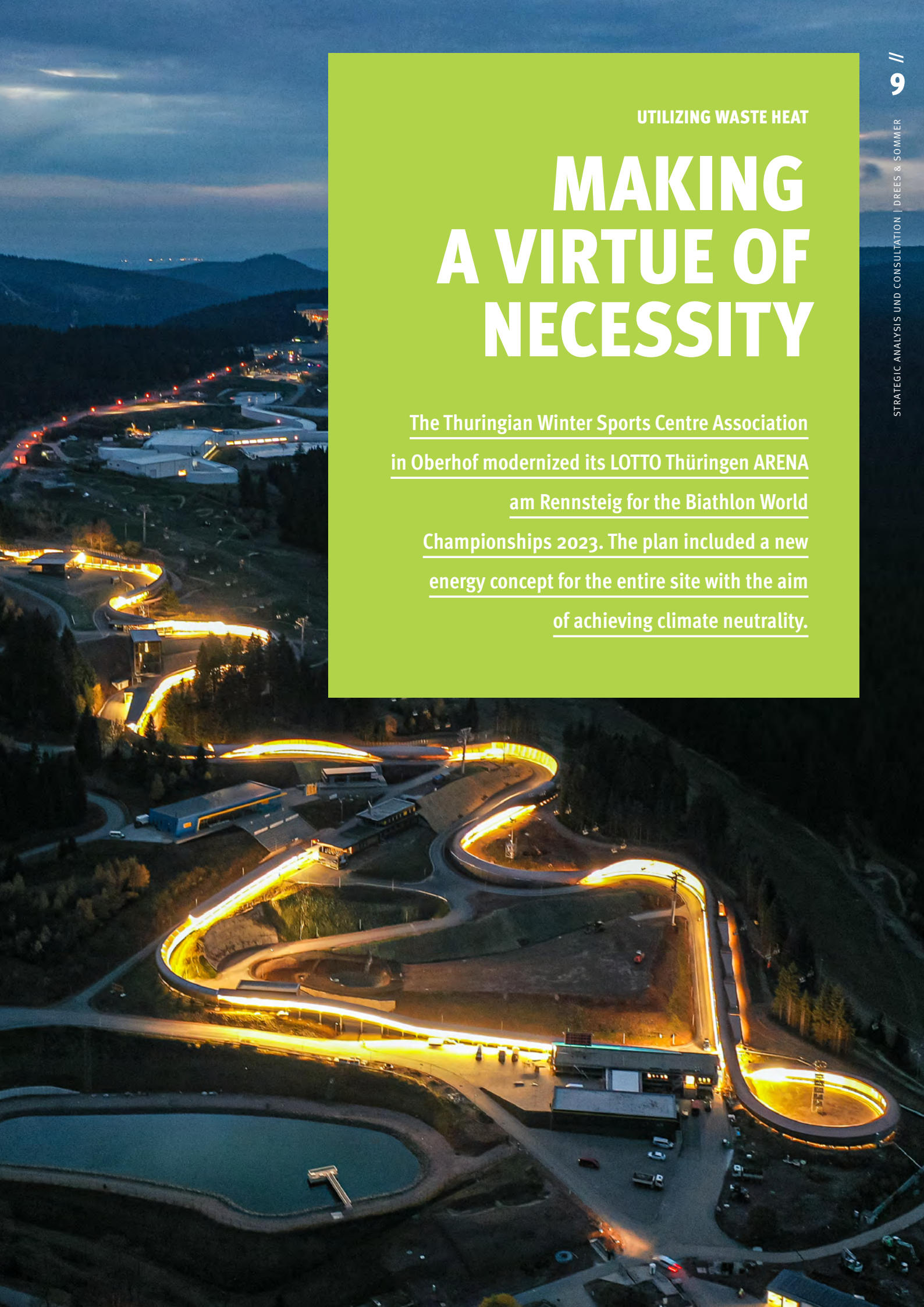
Jörg Schlenger
Dr.-Ing., Senior Expert
Team Leader Energy & Sustainability
Drees & Sommer SE

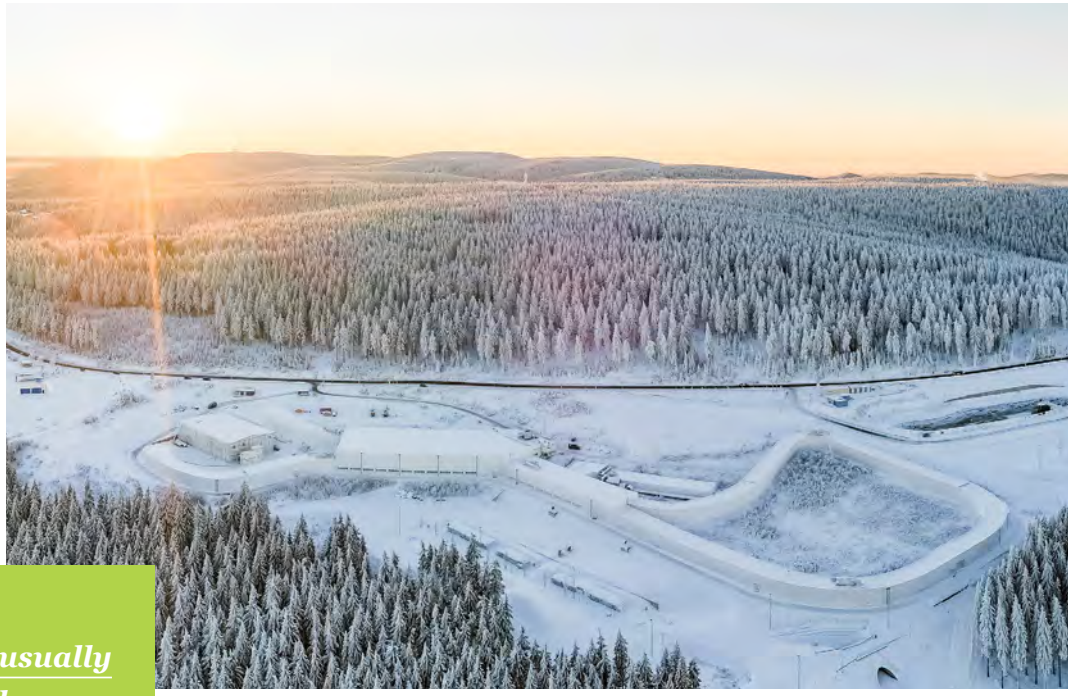
After graduating with a degree in civil engineering from the Technical University of Darmstadt, Jörg Schlenger first worked at the Institute for Applied Energy and Flow Simulation (ifes GmbH) in Frechen (North Rhine-Westphalia) before joining the Department of Climate-Friendly Architecture at the Technical University of Dortmund in 2004, where he completed his doctorate in engineering. He has been with Drees & Sommer since 2009, working out of the Frankfurt office on projects including energy design for the Frankfurt Messeturm (Trade Fair Tower) and for Terminal 3 at Frankfurt Airport. Jörg Schlenger is an expert in the field of Green Building, green consulting and certification (DGNB and LEED), and has been a Senior Expert and Team Leader, Energy & Sustainability since January 2024.



UTILIZING WASTE HEAT

MAKING A VIRTUE OF NECESSITY

The Thuringian Winter Sports Centre Association in Oberhof modernized its LOTTO Thüringen ARENA am Rennsteig for the Biathlon World Championships 2023. The plan included a new energy concept for the entire site with the aim of achieving climate neutrality.



Winter sports and sustainability are usually difficult to reconcile.

Despite the rather dreary weather in Oberhof on Friday, February 10, 2023, the atmosphere in the Arena am Rennsteig is electric. The first individual race of the Biathlon World Championships 2023 is about to start. It is the women's 7.5 km sprint and 96 athletes are at the start, among them the current German Olympic champion over twice the distance, Denise Herrmann-Wick. Buoyed by the wild cheering of her home fans, she puts in a strong performance.

The race favorite is French woman Julia Simon, but her hands are unsteady at the shooting range and she drops out of medal contention after having to ski two penalty loops. Herrmann-Wick hits the bullseye ten times and seems to fly over the demanding course. Only the Swede Hanna Öberg can challenge her in terms of speed – and even she can't quite keep up. At the finish line, Öberg is a razor-thin 2.2 seconds behind Herrmann-Wick. So it's gold for Germany! What a great start to the World Championships!

Nothing goes to waste

Oberhof has made a name for itself in Germany as a premier winter sports resort. A lot of that has to do with biathlon – and with the arena, which was built in the early 1980s. Remodeled for the first time in 1992, the stadium was given a facelift for the 2004 World Championships – and again for the 2023 World Championships. In September 2019, the Thuringian Winter Sports Centre Association started an extensive modernization program – and did not let either the COVID-19 pandemic or the impact of the war in Ukraine stand in the way.

During the thrilling days of the competition back in February 2023, the most obvious aspect of the modernization was the expansion of the grandstand capacity from 23,000 to a maximum of 27,500. But behind the scenes, the association – supported by Drees & Sommer – made a virtue of necessity by implementing the first steps of a new energy concept that aims to achieve climate neutrality for the entire site. Two local sports facilities that operate all year round – the LOTTO Thüringen EIS-ARENA luge track and the LOTTO Thüringen ski hall used by cross-country skiers and biathletes for training – require huge amounts of energy for their refrigeration systems. But they also produce reusable waste heat in the process.

Instead of allowing this waste heat to dissipate unused into the environment, the Thuringians now feed the energy into a so-called cold grid. “This works in a similar way to a heating grid,” explains Christian Krajci of Drees & Sommer. Heat pumps ensure that the stored energy can be reused for heating purposes, or for hot water production in the sports facilities. “The optimal re-use of the unavoidable waste heat makes energy or heat available in the long term – complementing energy generated by solar panels,” says Krajci enthusiastically. “We are proud be part of a motivated team alongside architects and specialist planners, led in a spirit of cooperation by Sylvia Böhm, project manager at the Thuringian Winter Sports Centre. Everyone in the team is convinced that the project will make an important contribution to the future sustainable use of the sports facilities in Oberhof.”

Entire concept to be implemented by 2026

The 2023 World Championships are already history and implementation of the energy concept is in full swing, with the aim of providing sustainable, autonomous and cost-efficient heating, cooling and power to the sports facilities and the Oberhof site. Drees & Sommer provided coordination support during talks with funding bodies and undertook various roles, including project control for the construction of a new power plant and a district heating network. In addition to the winter sports center, an adjacent army barracks, a hotel and other consumers in the area could benefit from these new facilities in the future. And who knows, perhaps this is the beginning of a sustainable energy concept for the whole of Oberhof. In addition to the measures described above, the installation of around 2,000 solar panels on all suitable roofs of the winter sports facilities will substantially increase the proportion of electricity they can generate themselves in the long term.

The association’s aim is to future-proof its operations. This is a mammoth task for winter sports, which face massive challenges as a result of climate change, resource scarcity and the energy crisis – in Oberhof and everywhere else. So it’s all the more motivating: And it is very encouraging to see that the initial successes of the Thuringians’ sustainability efforts in this and other areas are being recognized: The International Biathlon Union (IBU) awarded the World Championships hosts its IBU OC Award for Excellence in Sustainability for their exemplary local transport concept and for the use of HVO (Hydrotreated Vegetable Oil) fuel to prepare the tracks during the competition. And Oberhof took third place in the Venue & Event category of the Award for Sustainability in Sport.

Christian Krajci
Dipl.-Ing., Senior Team Leader
Drees & Sommer SE

After studying civil engineering at the University of Architecture and Civil Engineering in Weimar, Christian Krajci gained his first project management experience with a specialization in timber construction/construction management and business administration at the Thuringian Business Administration Academy working on the Erfurt Central Station project. He joined Drees & Sommer in 2007 and has headed the Erfurt branch since 2014. His professional focus is on hospital buildings, heritage-listed building projects, subsidized construction measures and industrial projects. In addition to the implementation of the energy concept in the Bavarian town of Oberhof, he was also heavily involved in a utilization concept for the Gera Arts and Culture Centre and in extension buildings for Bayer in Weimar.

REVITALIZATION IN THE INDUSTRIAL SECTOR

AT THE INTERFACES

An energy technology manufacturer wants to increase production output and needs a new hall. Drees & Sommer Integrated Factory Planning reconciled all of the client's requirements.

Older production facilities are often obsolescent. The technologies for which they were once planned and built may be outdated. Expectations regarding production and the associated processes have changed beyond the facilities' capacity to adapt, they are unable to participate in the energy transition, and the work environments are unattractive to desperately sought-after skilled workers. In short, they are neither modern nor fit for purpose.

Often, the initial reaction of companies in this situation is to want to abandon such factories and build new ones. But this greenfield approach does not always make economic sense because the production facilities can often be revitalized. They often have greater potential than appearances suggest.

Always looking for the optimal solution.
A globally active company in the field of power generation recently found itself in this very situation. The company was planning to increase its production output by a factor of 2.5 and quickly realized that achieving this goal would be beyond the limits of the existing infrastructure. It needed a new production facility – or a revitalized one.

These were the options available to the company after relocation to a larger site had already been decided – either the construction of a new state-of-the-art building or the use of an existing hall.The steel frame building dates back to 1911 and was extended with reinforced concrete in the mid-20th century. Different building heights as well as different floor types and levels within the hall only further complicated conditions. Nevertheless, thanks to a method developed by the Drees & Sommer Integrated Factory Planning team, revitalization of the existing building emerged as the more expedient solution.

The process combined all relevant factors and aspects: corporate and location strategy, energy-saving and climate protection targets, logistics and infrastructure conditions, and the need for good positioning in the war for talent. Integrated Factory Planning operates at the interfaces between production and the building itself, and involves all stakeholders throughout the course of a project, which lasts between eight and 14 weeks. In the case of the energy technology manufacturer, the output was a block layout that included reorganization of production and logistics. The key benefits were more efficient process and material flows, modular scalability for future growth, and the resulting flexibility and adaptability.

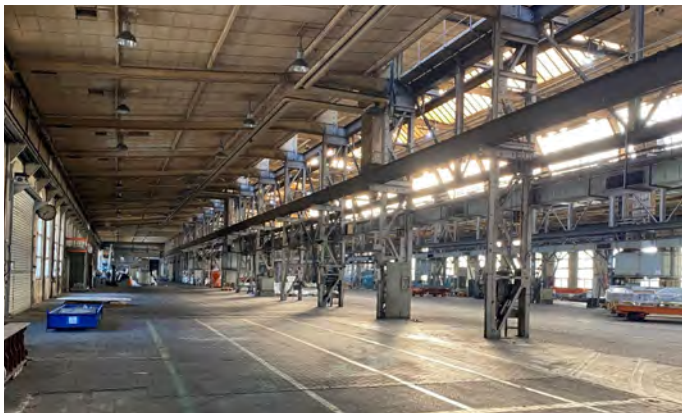
Production plants do not necessarily have to be built from scratch in order to meet state-of-the-art requirements.

Resolving the crucial issue – the column grid

The basic structure of the process is always the same: Assessment of the condition of the existing building is followed by six workshops, at the end of which master plans provide decision documents – including overviews of costings and milestone plans for different variants. Expertise in the fields of architecture, structural engineering, building services engineering, fire protection, workplace regulations and building physics is integrated. All disciplines and dependencies need to be taken into account.

Limitations resulting from the building structure and its column grid were crucial issues when it came to whether the energy technology manufacturer's existing hall could be converted into a new production facility. The company's products weigh between two and three tonnes and the production systems are correspondingly large. The linking of stations and internal traffic routing also follow set patterns. The review of the revitalization option had to take this into account.

"If you want the end result to stand up to scrutiny, you need a holistic approach and close cooperation between the construction departments on the one hand and production and logistics on the other," says Fabio Moser, Leading Consultant at Drees & Sommer. Even understanding the specific requirements and long-term strategy that determine the direction is a challenge. Achieving this paves the way for clarifying whether modernization, new construction, or a mix of the two approaches best meets the company's goals – thus laying the foundation for further measures through to the start of production in a sustainable, attractive factory.



Fabio Moser
Leading Consultant
Drees & Sommer SE

After studying mechanical engineering, economics and management at Aalen University, Fabio Moser started his professional career at Robert Bosch Manufacturing Solutions GmbH. There, as a project manager, he focused on initiating and implementing complex machines and systems engineering projects using state-of-the-art manufacturing technologies, intelligent assembly and testing solutions covering the Group's entire product lifecycle worldwide.

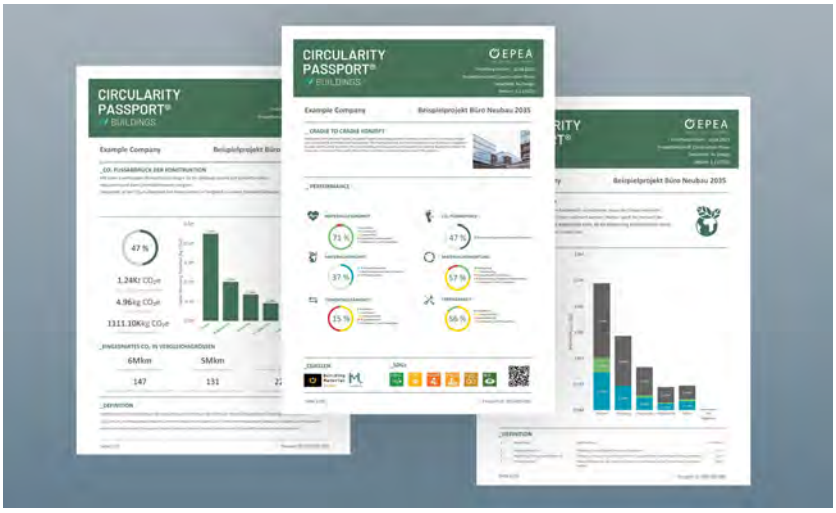
In his current role at Drees & Sommer in the area of Integrated Factory Planning, Fabio Moser acts as a consultant for medium-sized family businesses and international corporations on product, location, efficiency and digitization strategies for greenfield and brownfield projects. His customers include companies from the industrial, automotive, aerospace and related sectors.

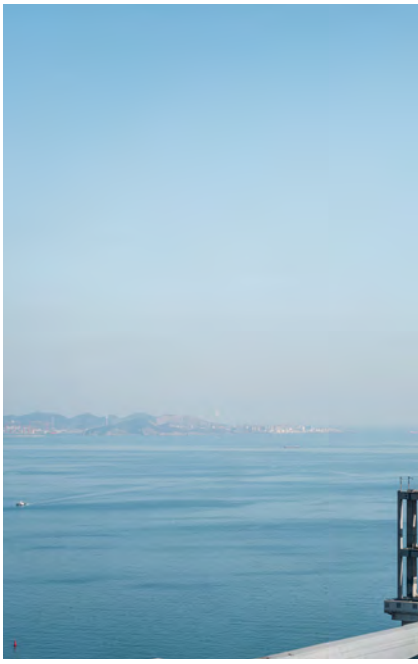
As a member of the Integrated Factory Planning management team, he drives the development and implementation of vision and strategy with a focus on organizational structure and the development of the service portfolio, and supports rollout at company sites.

URBAN MINING

EXPLOITING THE FULL POTENTIAL

EPEA – Part of Drees & Sommer and Madaster: Working together to resolve a range of raw material issues.





The idea that ‘Knowledge is power’ was posited by the British philosopher and statesman Francis Bacon, who, more than 400 years ago, was one of the founders of scientific empiricism’. When it comes to the materials used in buildings, ignorance often prevails – which is disempowering because, in future, property owners who want to renovate but don’t know which materials in a building can be reused or recycled will be squandering money.

This is where the concept of urban mining comes in. It is based on the principles of the circular economy to which two like-minded players have dedicated themselves: the Environmental Protection Encouragement Agency (EPEA) from the Drees & Sommer Group and Madaster, the online registry for materials and products used in buildings. EPEA promotes innovative, environmentally friendly industrial products, buildings and urban district solutions, while Madaster is a global online platform that enables the circular use of products and materials throughout the entire lifecycle of buildings and beyond.

The two are united by the goal of reducing waste, and instead being able to use resources over and over again. In other words, seeing cities as urban mines and buildings as raw material repositories. The EPEA experts collect information about the materials used on the basis of historical data and in-house analysis, such as details of the load-bearing structure, facade, windows and insulating materials. The questions they ask include: What materials of what quality do the individual components contain? Are they removable, separable, and recyclable? What is the impact of these materials on the carbon footprint of the components and of the building as a whole?

The answers are entered into a Building Circularity Passport, and they can be transferred to Madaster with a single click since for further processing and storage over the entire service life of the building. The data shows not only the carbon footprint and degree of circularity, but also the daily monetary value of the raw materials, as the Madaster platform is linked to commodity exchanges and other sources. Stakeholders can access transparently presented information in the building database whenever they choose.

In the ideal case, manufacturers agree to take responsibility for the value of the raw materials in their own products even after they have been sold and installed – for example by means of take-back agreements or leasing contracts. In the future, this will also help ensure that manufacturers are better informed about which raw materials are required and are locally available. This will create a new ecosystem between property owners and the building materials industry, resulting in greater agency for both parties: They will be able to cut carbon emissions and the costs for new raw materials and the disposal of old components, while at the same time reducing their dependence on suppliers and minimizing the impact of raw material shortages. They will also be able to reduce their role in water stress and biodiversity loss. And, in the best case, make their building an important part of a circular future.

Sybille Mai
Dipl.-Ing., Dipl.-Wirt.-Ing. (FH)
Leading Consultant
EPEA GmbH – Part of Drees & Sommer

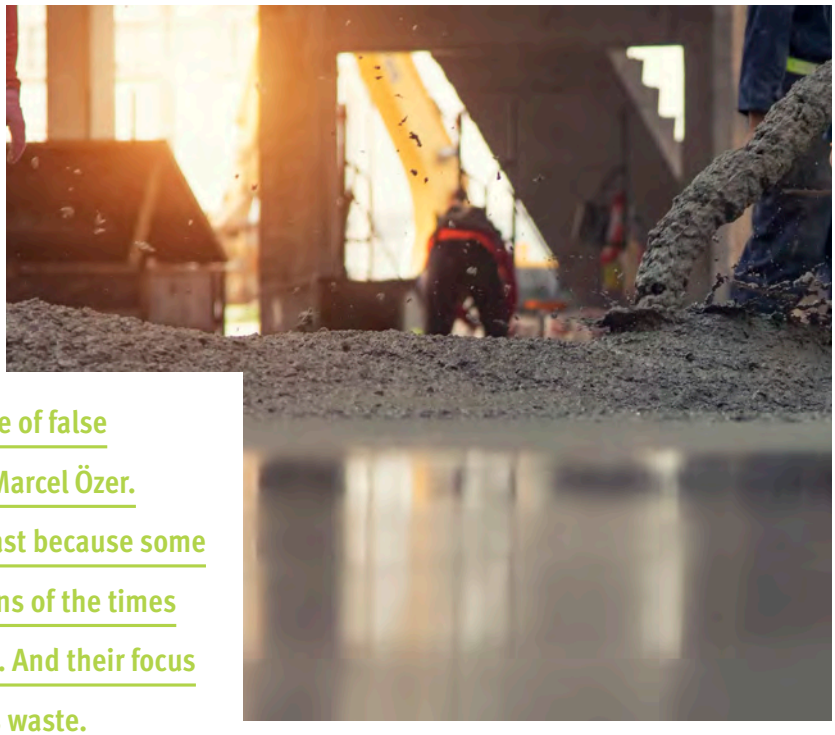
Following an internship semester at Michigan Tech University, in 1995 Sybille Mai completed her studies at the University of Architecture and Civil Engineering Weimar (now the Bauhaus University) with a degree in civil engineering. From 2008 to 2015, she was primarily responsible for aspects of sustainability in buildings and Technical Due Diligence at Drees & Sommer's Berlin regional office. As a qualified DGNB auditor, she has been involved in numerous Green Building certifications. Based on this expertise and her experience in property management and project control, she is now setting up another EPEA regional office in Berlin in the role of Senior Consultant. Her focus is on designing buildings that are regenerative, flexible and healthy as well as on the optimization of sustainability and economic aspects.

The goal is to establish the mindset where cities are seen as urban mines and buildings as raw material repositories.

INTERVIEW

GOOODBYE TO WASTE

Marcel Özer, Head of Real Estate at EPEA GmbH – Part of Drees & Sommer, answers questions about the hidden treasure in our buildings and how it can be used.



The current circular economy is actually a case of false labeling, says environmental science expert Marcel Özer. But the situation is changing rapidly – not least because some industrial companies have recognized the signs of the times and are working on new cooperative ventures. And their focus is on resources that others have written off as waste.

Mr. Özer, you and your EPEA colleagues refer to buildings as raw material repositories and convey an image of them as treasure troves. That point of view is probably still foreign to many property owners, isn't it?

Momentum is building and people's awareness is changing. But certainly, the practice has been to think only as far as the demolition of a building and to regard the materials that accumulate as waste rather than as a source of secondary raw materials.

The Cradle to Cradle principle on which EPEA is based counters this by showing ways to process products in biological or technical cycles and recycle their constituents as nutrients without loss of quality or value, provided that the ingredients are chemically harmless, separable by type, and can be disassembled.

Exactly. That's why I also refer to 'materials' at the end of a product's first lifecycle, never to waste. Up to now, the 'circular economy' has been little more than a waste management system with a circle drawn beneath it. In order to combat the impacts of raw materials shortages and climate change, we must place much greater emphasis on reuse and reprocessing – and not just for environmental reuse and reprocessing reasons. The capital tied up in the building materials can be regarded as a medium- to long-term investment and any repair, demolition or disposal costs can be reduced to a minimum.

And this conviction is gradually gaining traction?

Indeed it is. The argument used to be that if we build a new state-of-the-art building, we are all set for the next 40 to 50 years. But nowadays, you cannot even start construction without analyzing the existing building stock and presenting the added value, for example in terms of carbon footprint reduction. This is also reflected in the requirements imposed by cities and local authorities. Increasingly, new buildings have to demonstrate that they are just as good as or even better than existing buildings. And as soon as it comes to demolition, urban mining comes into play.

New buildings can be planned and built in accordance with Cradle to Cradle principles without encountering any serious obstacles. What problems do you face with established portfolios?

The biggest one is the lack of knowledge. For example, project developers contact us wanting to acquire land and needing to know how to deal with the established buildings but don't know what criteria to use to evaluate them or what process they must adopt. The situation is further complicated by the fact that there is often no detailed information on the materials used in the original construction. In addition, architectural and project planning firms have little training in how to handle urban mining. No training is offered on the subject and there is not yet a suitable fee or process structure in place for that work.

Your EPEA colleague Matthias Heinrich has developed an Urban Mining Screener in collaboration with Madaster. How does it work?

The Urban Mining Screener is based on building standards specific to certain regions during certain periods for particular building types of use and designs. Simply on the basis of the location, year of construction, building volume, building type and some other information – and without the need for time-consuming inspections – the application makes informed deductions regarding the materials used. Initially, this only gives a rough idea, but detailed research shows that the results are surprisingly accurate. This gives portfolio owners a completely new level of certainty. It also allows them to take a totally different approach to negotiations with demolition companies and to argue that the work should be free of charge as the demolition company can on-sell the materials. Or better still: They don't have to take the conventional approach at all, but can sell the materials on the market themselves – an 'industrial reuse scenario', so to speak.

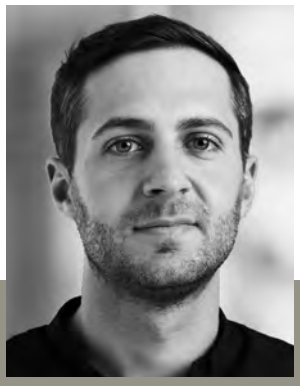
Two places where this has been achieved are the Patrick Henry Village in Heidelberg and the Besenbinderhof in Hamburg. What can you tell us about these projects?

The city of Heidelberg wants to become a circular city as it transitions to climate neutrality and also aspires to be the first city in Europe to implement an urban mining concept. First Mayor Jürgen Odszuck approached us, and the building materials group Heidelberg Materials – formerly HeidelbergCement – also came on board. They see the city as a supplier of recyclable concrete, with reliable data on quantities and qualities available for the first time. And on top of that, Heidelberg Materials is using a new process to bind carbon and reduce emissions during cement production. Schüco is one of the partners for the Besenbinderhof project in Hamburg. A material flow analysis has shown that aluminum struts can be separated during facade renovation. So Schüco will act as a material dealer and will organize all logistics, purchase the material, and recycle it into new products. We call

this industrial reuse. These concepts are game changers and will fundamentally transform the system. And all this only because we obtained information that increased the attractiveness of the embedded materials used in construction.

The Federal Government's coalition agreement provides for the introduction of a digital resource passport for homes. One of the goals is to create transparency about the materials used in construction. The EPEA has had a passport like this for some time – its Circularity Passport®. What would be the advantage of implementing a national passport?

We expect the Federal Resource Passport for Buildings to pass into law 2024. As yet, it is unclear what form it will take and how detailed it will be. It is clear, however, that this will result in a higher level of data reliability – as has already been achieved with the Energy Pass. And it will be another means to rapidly and effectively tackle our climate and resource problems and achieve greater competency in the areas of health and the environmental compatibility of materials. After all, we spend 90 percent of our time in buildings, so the air we breathe should not be doing us harm.



Marcel Özer
M. Sc.
Senior Manager
EPEA GmbH – Part of Drees & Sommer

Marcel Özer studied Environmental Sciences at the University of Stuttgart and at the École spéciale des Travaux publics, du Bâtiment et de l'Industrie in Cachan near Paris. He joined Drees & Sommer immediately after completing his master's degree and was involved in setting up the new Regenerative Planning and Construction department. In 2019, he was appointed Manager in the Cradle to Cradle Real Estate department of EPEA GmbH – Part of Drees & Sommer, and since January 1, 2024 he has been Head of Real Estate at EPEA. His goal is to drive solutions that turn material and resource flows in buildings, districts and cities into closed cycles.

Following their conference at the end of November 2023, the ministers and senators with responsibility for urban development, construction and housing in the federal states published a position paper declaring the revitalization of the existing building stock to be a fundamental principle and advocating many of the concepts that EPEA and Drees & Sommer also promote. Is that an encouraging sign?

Absolutely! Because the individual goals and criteria in the position paper are now much more precise than in previous declarations of intent. This is just another sign that momentum is gathering to incentivize better business models and establish a Circular Economy that truly deserves the name.

Every established property poses its own particular challenges: custom-built structures, later additions, and the installation of building services equipment at different stages of technology. Feasibility studies examine different variants for transformation based on economic and ecological criteria. This works just as well for hospitals with their complex technical infrastructure as for entire neighborhoods, for example when a local authority wants to etablish a specially organized climate-neutral energy supply. The following are examples of when it works.

WHEN IT WORKS

In-depth feasibility studies

Fotografie: Karin Gauch und Fabien Schwartz

GREEN HOSPITALS

SUSTAINA-BILITY PROMOTES HEALTH

Hospitals consume huge amounts of energy and operational costs are skyrocketing. The Diakonie Hospital Bad Kreuznach is responding to this challenge – while at the same time taking ESG criteria into account during refurbishment.

Demolish and rebuild or refurbish and extend? That was the question.

Hospitals are in non-stop operation all year round – 24/7/365. They have to be there for the people who seek help in them. This is reflected in figures that give hospital administrators nightmares: On average, a hospital consumes as much energy as a small town. Studies show that between 300 and 600 liters of water per day is required for each in-patient in a German hospital. And with emissions accounting for 4.4 percent of global greenhouse gases such as carbon dioxide, the health sector has a worse footprint that aviation or shipping.

More and more hospital operators are being forced to take appropriate measures to rein in energy consumption. They are transforming their hospitals into green hospitals by applying sustainability and social principles, as well as environmental, social, governance (ESG) and other criteria. They are establishing more environmentally friendly, resource-efficient and economically sustainable processes, and are striving to improve user satisfaction, both of those providing medical care and those being cared for.

Renovation trumps new construction

The Diakonie Hospital in Bad Kreuznach (Rhineland-Palatinate) has set out to comprehensively modernize its established building and become a Green Hospital. Initially built in 1987 with a second construction stage in 1996, the hospital is located on the historic site of its operator, the Kreuznach Diakonie Foundation. It has eleven specialist departments and is a teaching hospital of the Johannes Gutenberg University Mainz.

The foundation's first step in the transformation process was to establish which option would be more economical: demolition and rebuild or renovation and expansion. It sought external advice before making the decision. The healthcare team at Drees & Sommer examined the lifecycle costs and environmental impact of both variants – with a particular focus on 'grey energy', that is, the energy already embodied in materials before they are used on the construction site. This was one of the key factors in the operator's preference for renovation, because the grey energy embodied in the materials of established buildings does not need to be taken into account in a fresh environmental audit.

The study was not Drees & Sommer's first involvement in the project. Prior to this, the healthcare experts had already drawn up an operations concept, as well as a space and functional program, and coordinated these with the users and the operator. While the concept was still under review, Drees & Sommer developed the structural target plan, undertook a feasibility study, and ensured compliance with German Procurement Ordinance procedures – including engineering consulting for the building services equipment, fire protection investigations, support for integrated design and facade technology planning. Implementation began in March 2023.

High cost with high potential benefits

Upgrading hospitals to green hospitals requires additional investment. According to studies carried out by the Institute for Health Care Business GmbH (hcb) and PwC, however, the investment always pays off – not only because of the subsequent financial savings in the millions, but also because of the resulting health benefits and greater staff and patient satisfaction. The Deutsches Ärzteblatt (German Medical Journal) refers to studies on green buildings and their occupants, which show greater well-being as the result of fewer allergies, asthma and other respiratory diseases, reduced stress, etc. due to improved air quality. The productivity of employees also increases, as does the quality of treatment, which in turn leads to lower patient mortality.

Published in October 2023, the PwC study 'Green and Digital – The Hospital of the Future' takes the high maintenance and modernization backlog as an opportunity to make an urgent call for upgrading buildings and infrastructure. According to the study, this is the only way hospitals can become fit for the future, optimize their operating costs and achieve! their climate targets.

Jürgen Zimmermann
Dipl.-Ing. (FH), Architect
Associate Partner
Drees & Sommer SE

Jürgen Zimmermann is a qualified engineer and architect. He began his professional career in 1987 as a project manager in facility management. From 1992 he worked as a project manager in the hospital sector. He joined Drees & Sommer SE in 2018 and is now head of the healthcare team in Frankfurt, a member of the industry core team, and an Associate Partner. Mr. Zimmermann has more than 30 years' experience in project control of hospital construction projects. His expertise includes the development, structuring and management of highly complex hospital construction projects, subsidy management, and the modernization of hospitals during ongoing operation.

He is also the convenor of the well-established Next-Generation Hospital Buildings conference held annually in Germany and Austria, as well as of Immohealthcare in Switzerland.

INTERVIEW

CLUSTERS ARE THE FUTURE

In this interview, energy expert Professor Michael Bauer, Partner at Drees & Sommer, discusses the challenges and strategies for the technology that everyone has been talking about lately.

The heating system of the future will use electricity, local or district heating and will no longer be oil- or gas-fired. Of that, Michael Bauer is certain. So, very soon, property owners will have to look at how they can get an economically viable electric heating system or local or district heating system installed in their properties. He considers one technology unbeatable in terms of efficiency in places that have no local and district heating: the heat pump.

Prof. Bauer, what brought you to this conclusion?

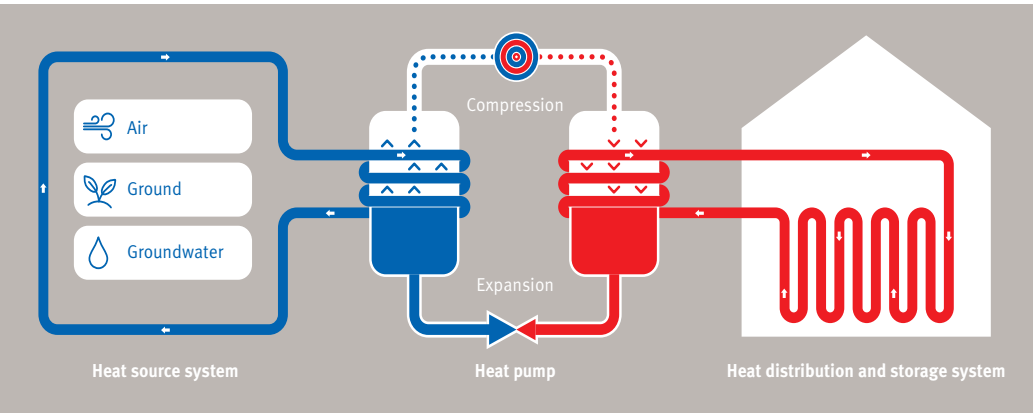
That is best answered with a sample calculation. Depending on conditions, a heat pump can generate between three and four kilowatt hours of heat from one kilowatt hour of electricity. Regenerative local and district heating systems are also an option. For them, however, the location of a building and the local authority infrastructure play a critical role. That's why heat pumps with a storage tank offer very interesting solutions for energy concepts that are both economical and ecologically sound.

Why, then, are we not a lot closer to the German government's goal of having six million heat pumps installed in German residential buildings by 2030?

First and foremost because there is a lack of expertise in the market. Planners, consultants, contractors and customers don't know how to install heat pumps in existing buildings in a technically practical and economically viable way.

So we know how it would work in theory, but it's not so simple in practice?

Exactly. Let me give an example: Before installing heat pumps in older established residential buildings, the existing heating system has to be examined in detail. Heat pump technology is most effective when the temperature difference between the heat source (such as the outside air, geothermal energy, groundwater or wastewater, or ring trench collector) and the heat sink (that is, the operating temperature of the heating system) is as small as possible. But as most existing heating systems have fairly high



operating temperatures, you have to first measure and calculate how far the flow temperature can be lowered while still delivering sufficient heating. If the flow temperature cannot be lowered sufficiently for economic operation, consideration must be given to what other measures are feasible without the cost exceeding the benefit: Increase thermal insulation? Increase the size of heating surfaces? Install heat accumulators for peak loads? What is the cost/benefit? Generally, small businesses cannot afford to provide this service. And customers are not usually willing to pay extra for such consulting services.

What other questions are relevant?

How does the current heating system operate? Can photovoltaics improve the ecological footprint and economic viability? What heat source is most practical? What subsidies are available, who is entitled to them, and what do they are apply to? How high are they and what impact do they have on overall costs? And there are other challenges due to uncertainties: To date, there has simply been a lack of sufficient design and operating experience, especially for the correct combination of individual technical components. There are solutions, but they are not widely known in the market. In my view, we need to develop standardized procedures for the established housing market – or even standardized recommendations for similar types of buildings. For example, buildings could be clustered by age or energy efficiency class. Then all the players in the market could apply these guidelines and recommendations instead of reinventing the wheel.

In other words, despite the many unanswered questions and challenges involved, you are convinced that it is right to promote the use of heat pump technology?

Absolutely. All the necessary technical components are available. And they are mature. I also consider the government's goals and regulations to be both necessary and appropriate because oil- and gas-fired heating systems are not sustainable from either the climate protection or the geopolitical point of view. Of course, there could be shortages of heat pumps in the short term because the industry cannot meet demand rapidly enough. But experience has shown that the market responds very quickly.

What advice do you have for property owners?

They should be looking at how they can transition to a climate-friendly future as economically as possible. To do this, they should have a professional assessment carried out to determine which renewable energy systems are viable, what conversions are required, and how established buildings can be converted. For commercial real estate, the EU Green Deal, ESG requirements and the EU Taxonomy provide guidance. Those who do not take action now must sooner or later reckon with a loss in value. In the worst case, unrenovated buildings may become unsellable.

Michael Bauer
Prof. Dr., Partner
Drees & Sommer SE

Michael Bauer has been with Drees & Sommer since 1999 and has been a Partner since 2005. He is responsible for engineering consulting – in particular for holistic consulting on energy design, energy management, building technology, Green Building, sustainability, carbon emissions, ESG, climate-positive buildings and infrastructure as well as for grid-responsive buildings. He is also an expert in the development of innovative energy concepts, new commissioning methods and technical project management.

His reference projects include the town hall in Stühlinger in Freiburg, the experimenta Science Center in Heilbronn, the new Stuttgart Trade Fair Centre and the development of the Pier A-Plus for Frankfurt Airport. Michael Bauer completed his studies with a focus on energy-saving building technology at the University of Stuttgart, where he also wrote his doctorate on the simulation of energy-saving heating systems. Today, he teaches there as an honorary professor at the Institute of Building Energetics, Thermotechnology and Energy Storage and at the Institute of Construction Management. He has shared his knowledge as co-author of the book Green Building and in many other publications. Michael Bauer is a pro bono member of guideline and technical committees of the VDI and the DGNB.

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CLIMATE-FRIENDLY LOCAL HEATING NETWORK

A WHOLE VILLAGE GOES GREEN

A working group formed by citizens in the city of Rottenburg made a proposal that was taken up by the municipal authority. Drees & Sommer looked at the feasibility and found that yes, the village of Oberndorf could soon make itself independent of fossil fuels.


© Stadtverwaltung Rottenburg am Neckar

Rottenburg, a city on the River Neckar in the district of Tübingen, looks back on a long and eventful history. In 2024, the city will celebrate its 750th anniversary, but the first settlements in the area existed long before that – as far back as the Neolithic Age. There are even older traces left by hunters at the time of the Neanderthals. And Celts and Romans were also there, as can be seen at several sites around the city.

The heating technology in the Rottenburg suburb of Oberndorf is not quite so historic. Located on the northern edge of the city, the situation in Oberndorf is the same as in many other places: dependence on fossil fuels (in this case primarily heating oil) is high, and the heating systems are obsolescent having been in operation for more than 20 years. With a renewal of the systems and a cost- and climate-conscious solution in mind, the Oberndorf Local Heating Task Force was founded in 2021. Its aim was to establish a company owned by the local citizens to establish a climate-friendly local heating network.

The idea found the support of the local council. The city decided to examine whether it would be feasible to establish a local heating network to supply all buildings in the village, which is home to 1,500 people. Drees & Sommer was awarded the contract to develop an energy-efficient district heating concept.

A long list of key benefits

The key arguments in favor of shared local heating networks are self-apparent. “They are not only environmentally friendly, but often also make economic sense,” says Natalie Schmid, project leader and consultant at Drees & Sommer. The Oberndorf working group is making a strong case for membership of the scheme on its website. People who have their house connected not only save space at home as they no longer need their own fuel storage, but also no longer have to deal with maintenance and repair issues. Costs are split between all parties involved, so the more people join, the cheaper it is for each member. The working group cites eliminating dependence on heating oil and gas and security in the face of future energy crises as further benefits.

But are the specific conditions in Oberndorf also favorable? And what needs to be done to ensure that the heating network delivers what it promises? The role of the Drees & Sommer concept was to answer these questions. To this end, Schmid and her team systematically surveyed the entire village of Oberndorf and its current status, examining the age, condition and renovation requirements of the building stock as well as building density. All the possible heat sources – groundwater, wastewater heat, waste heat from processes, solar thermal energy – were examined for their potential. Geothermal energy was quickly ruled out as an option because of the gypsiferous subsoil. Mobility aspects and climate adaptation measures were also covered in the study.

Drees & Sommer already has substantial experience with similar analyses, and is currently undertaking several in the state of Baden-Württemberg alone. Energy-efficient urban district concepts have been created for the Stuttgart districts of Möhringen, Rot and Obertürkheim. Local heating networks are attractive options for cities and local authorities to achieve the energy and heating transition, as they are required to be climate-neutral by 2045 and must meet the requirements of the EU Green Deal and the German Climate Protection Act. The proposition is made even more attractive by the fact that the state-owned KfW Bank will subsidize 75 percent of the cost.

Beauty that lasts

In September 2023, Drees & Sommer submitted its concept for Oberndorf to the Rottenburg municipal authority – and is now eagerly awaiting further developments. Will the local heating network be implemented? And will it be adopted not just in Oberndorf, but also in the other towns? From the very beginning, the city leaders had hoped it would be possible to apply the findings to other parts of the city.

It would suit the city and its principles if it were to implement the local heating network city-wide. The environment and sustainability are close to the hearts of the people of Rottenburg, just like their own history. And for good reason: On its website, the city advertises its tourist attractions and promises recreation and exercise on foot, by bike and on the water 'in natural landscapes of great beauty'. It is that beauty that must be preserved.

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Natalie Schmid
Consultant
Drees & Sommer SE

After studying environmental engineering at the University of Stuttgart, Natalie Schmid started her professional career in 2018 in a planning engineering office for building services equipment. Her main role there was the development of energy concepts and technical transformation plans for industrial properties. In addition to project experience in the automotive industry, she has created concepts for universities, and office and public-sector buildings. In 2022, Natalie Schmid moved to the Engineering Consulting department at Drees & Sommer und as a consultant, where she is primarily responsible for projects in the field of municipal heat planning and energy-efficient urban refurbishment. She also conducts studies on federal funding for efficient heating networks.

Moritz Hummel
Dipl.-Ing. (FH)
Senior Consultant
Drees & Sommer SE

Heating and cooling systems, regenerative power supply and issues of energy resilience, security of supply and self-sufficiency – these are some of the areas on which Moritz Hummel focuses in his everyday work. After graduating with a degree in building services engineering and energy technology from the Beuth University of Applied Sciences in Berlin, Hummel joined the Fraunhofer Institute for Solar Energy Systems as a development engineer. He also held positions at Invensor GmbH, Scholze GmbH, Kofler Energies Ing.-GmbH and Sütterlin + Partner GbR, where he worked for seven years as a BSE project manager with responsibility for consulting and planning. Moritz Hummel has been working at Drees & Sommer SE in Freiburg since 2022.

A sound strategy, a well-thought-out plan and reliable analyses and forecasts form the foundation for realizing the full potential of the established portfolio. But whether this will actually succeed only becomes apparent when things get serious – during implementation. For example, when it comes to collecting and evaluating data to demonstrate future potential, linking the old with the new, or meeting cost and schedule requirements. Above all, however, it is important not to let difficulties and obstacles stand in our way as we transition to climate neutrality.
The following are examples of how it works.

HOW IT WORKS

Implementation

GROSSSIEDLUNG TELLI

REFURBISH-MENT OF OCCUPIED HOMES

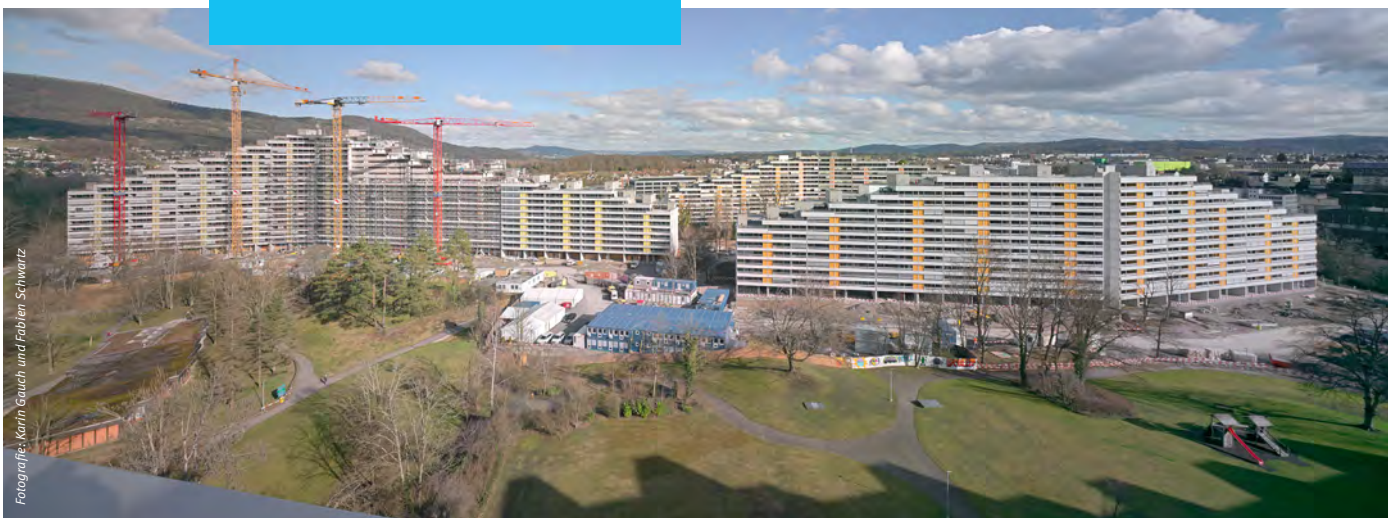
Distinctive high-rise buildings in Aarau have undergone safety and energy-efficiency upgrades with minimal inconvenience to tenants.

Fotografie: Kamm Gaudr und Fabien Schwartz

The Telli precinct in Aarau, Switzerland has an eventful history. Located about one and a half kilometers northeast of the medieval town center, at the turn of the 20th century there were just a few factories there. After the Second World War, the city connected large parts of the area to the sewage and drinking water networks and the electricity grid, and the first simple apartments were built. The large housing complex comprising elongated high-rise buildings came a substantial time later. They were built between 1971 and 1991 to plans by the architect Hans Marti, a Swiss pioneer of systematized local and regional planning. Today, every eighth resident of Aarau lives in the Telli.

The long construction process is an indication that this is no ordinary complex. The Telli high-rises are a landmark and are listed in the Swiss Inventory of Cultural Property of Regional Importance. And the comprehensive energy-efficiency upgrade of two of the four apartment buildings turned out to be correspondingly complex. The owner, the AXA Investment Foundation, began planning the modernization in spring 2016 with the goal of making no fundamental changes to the appearance of the buildings. Following an intensive planning phase, the renovation was efficient, taking just three years. Drees & Sommer supported the project as general planner and overall project manager for construction management with the aim of ensuring structured execution.

A true landmark: the Telli precinct in Aarau.



Fotografie: Karin Gauch und Fabien Schwartz

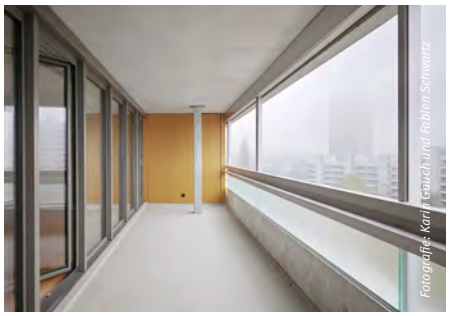
Fotografie: Karin Gauch und Fabien Schwartz

Carbon emissions cut by around 1,000 tonnes

A few key figures illustrate the scale of the mammoth renovation, which involved two buildings with 24 entrances and a total of 581 apartments housing some 1,000 people. 16,250 tonnes of concrete elements had to be moved and 1,800 facade elements replaced. The area of the renovated facade was equivalent to three football pitches. 1,200 doors and 9.5 kilometers of balcony railings were also part of one of the largest renovation projects in Switzerland, which cost more than CHF 100 million and brought the Telli high-rises up to date in terms of energy conservation and safety. Fire protection and earthquake safety now also comply with current regulations and the renovation has cut carbon emissions by some 1,000 tonnes per year thanks to a completely new building shell (including windows and roofs). Heating consumption was also cut significantly by switching from gas to district heating.

Among the main players were the architects from Meili Peter & Partner, who were very familiar with the concrete element construction method, and the team from Drees & Sommer, which was entrusted with overall management and construction management. The Drees & Sommer team had to deal with a particularly challenging aspect of the project – the renovation took place with the apartments still occupied, and so the tenants experienced the action first-hand throughout almost the entire project. They only had to vacate their apartments for a period of about a week and a half, during which time the balconies, facade parts, doors, heating and ventilation systems were replaced. “That was very special,” reports Drees & Sommer project manager Julian Kommer.

Fotografie: Karin Gauch und Fabien Schwartz



Fotografie: Karin Gauch und Fabien Schwartz

Fotografie: Karin Gauch und Fabien Schwartz

The refurbishment project involved a facade area the size of three football pitches, 1,200 doors and 9.5 kilometers of balcony railing.


Fotografie: Karin Gauch und Fabien Schwartz


Fotografie: Karin Gauch und Fabien Schwartz

Lean Construction Management contributed to success
The desire to minimize the impact on those most directly affected led to several measures. There were a large number of information events, and a special app for tenants called beUnity, which provided up-to-date information on the renovation, any changes to construction schedules, downtimes for electricity and elevators, etc. The community app was also regularly used by tenants to provide help for each other, for example, when someone needed help carrying their shopping up to their apartment. Alternative accommodation was made available during apartment renovations, and logisticians made sure that tenants' furniture could remain in place. The key aspect, however, was to ensure the reliability of the schedule. To achieve this, Drees & Sommer used Lean Construction Management, an approach to agile and lean projects that originated in the automotive sector, but has long since proven itself in the construction industry as well. LCM allows a systematic focus on the planning processes and prioritization of tasks and content, which helps with targeted control of iterative and creative processes. Processes are displayed visually, creating a clearly structured sequence for all parties involved on the planning, client and user sides.

Preserving values while creating something new' is how site manager Kerstin Spalek of Drees & Sommer characterized her task in a report on Swiss television (SRF). "Is it really worth all the effort?" the reporter asked a representative of AXA in the same segment. His answer: "It certainly is! If you don't invest, there will come a time when you won't be able to rent out the property anymore."

Julian Kommer
B. Sc., M. B. A.
Associate Partner
Drees & Sommer Schweiz AG

Julian Kommer started his career at an architectural and planning firm in Stuttgart while he was still studying architecture and urban planning at the University of Stuttgart. After completing his studies, he moved to an architectural firm in Zurich before joining Drees & Sommer Switzerland in 2014. While working, he completed a part-time MBA in International Real Estate Management in London, Zurich and Biberach. He was initially employed by Drees & Sommer Switzerland as a project manager. In the years that followed, he built up the Construction Management and General Planning department in Switzerland, an important part of Drees & Sommer Switzerland's service portfolio. As a result of these successes and his expertise in the areas of general management, construction management and Lean Construction Management, he was appointed Managing Director of Drees & Sommer Switzerland and Associate Partner in 2023. Julian also works as a lecturer on the Circular Economy in the construction industry at CUREM – Center for Urban & Real Estate Management at the University of Zurich.

MODEL ECO-BUILDINGS

EVERYTHING THAT'S POSSIBLE

For three years, the municipal company Mannheimer GBG Unternehmensgruppe GmbH monitored the results of two energy-efficiency upgrade programs as part of the SQUARE project.


© Timo Volz


© Reinraum GmbH

For 60 years, the sprawling site of the former Benjamin Franklin Village was home to US forces.

'Conversion' is the name of the city of Mannheim's project group, whose members were tasked with some very challenging work. The project is about actively promoting change, and about the transformation of huge areas in the sense of the original Latin root 'conversio'. Covering an area of 1.4 million square meters, the multi-layered, vibrant district of Franklin is as large as Mannheim's city center but doesn't even cover half the area that the Conversion project group is dealing with.

So it's no wonder that the urban development corporation MWSP speaks of 'an extraordinary opportunity' – made possible by the withdrawal of the US military, which operated a city within the city for 60 years on the sprawling site of the former Benjamin Franklin Village (BFV). As many as 10,000 Americans lived and worked on the U.S. Army compound. In the middle of Franklin are two identical apartment buildings that reflect the original character of the dwellings, each with 24 three- to five-room apartments, seemingly inconspicuous and seemingly insignificant in the grand scheme of things. But only at first glance. Because the two buildings are model eco-buildings, providing future-oriented data on different energy standards and technical concepts relating to energy-efficiency upgrades.

Two buildings, two approaches

Smart quarter and urban area reducing emissions (SQUARE) is the name of the research project being undertaken by the Mannheim-based GBG group, with Drees & Sommer the partner responsible for General Construction Management and ap88 the architects responsible for the conversion. It was a daunting enterprise, as the standard of accommodation was outdated and the building fabric in poor condition. For this reason, the buildings were remodeled with new floor plans and retrofitted with reinforced load-bearing structures and balconies, as well as with enhanced fire protection and sound insulation.

After that, the actual project could start. GBG gave one building the name 'SQUARE now' and renovated it in accordance with the requirements of EnEV 2014 (Energy Conservation Ordinance, status January 1, 2016). The other is called 'SQUARE next' and has been modernized based on the EnerPHit Plus standard developed by the Passive House Institute Darmstadt. In both cases, the aim was to achieve maximum ecological compatibility and, during a three-year monitoring process also supervised by Drees & Sommer, to find out what insights could be gained for integrated carbon reduction solutions at the district level by comparing SQUARE now and SQUARE next. So in essence, the project serves to demonstrate the energy-efficiency upgrade of residential properties based on reliable data.

A smorgasbord of promising approaches

Numerous technologies were implemented in the project: smart grid, smart home, grid-responsive low-, zero- and plus-energy houses, including storage technologies for electricity, heating and cooling, as well as energy and load management. For example, SQUARE now, which underwent standard renovation according to EnEV 2014 (Energy Conservation Ordinance), was given a new facade with double glazing and thermal insulation, and was then connected to the district heating network for the supply of hot water and heating energy. In keeping with the overarching project goals, in addition to meeting the requirements of EnEV 2014, the building was also equipped with solar panels and a battery storage system.

In addition to conventional solar panels, hybrid collectors – so-called photovoltaic thermal collectors (PVTs) – were also used in SQUARE next to supply thermal energy in addition to electricity. A lithium-ion battery stores electricity, while an ice storage system stores thermal energy. The ice storage tank served as a source for a central heat pump. Regeneration exploits the thermal yield from the PVT collectors, with the option of direct use, especially in spring and autumn for pre-warming drinking water. Every apartment has underfloor heating in all rooms and an 'energy speedometer' developed by Drees & Sommer. The so-called EnerTouch system provides tenants with continuous feedback on their electricity, water and heat consumption – thus eliminating the rebound effect, where tenants tend to be careless with their energy consumption because they know they are in an energy-efficient environment.

Current results from the ongoing monitoring confirm the predicted savings. For example, SQUARE next's carbon equivalent emissions of 6 g/m²a of living space per year are significantly lower than SQUARE now's 20 g/m²a. By way of comparison, the national average for residential buildings including user electricity is 41 g/m²a. The fact that the predicted savings have now been proven in practice is also thanks to intensive technical monitoring of building and plant operation during the decisive first phase of use. Unfortunately, in practice hardly any building – whether new or established – achieves the level of functionality and energy targets set during planning. The real problem, however, is that these shortcomings are often only discovered after many years, if at all.

The interest in SQUARE extends far beyond Mannheim – much to the delight of Steffen Szeidl, Chairman of the Board of Management of Drees & Sommer, who sees the project as proof that energy the optimization of established buildings is necessary and sensible, both from an ecological and an economic point of view. "Such projects should not only be implemented as research projects, but realized on a large scale, allowing us to significantly increase the renovation rate and achieve our climate protection goals in good time," he says. Coincidence or not, there is another translation for the Latin word conversio: Revolution!

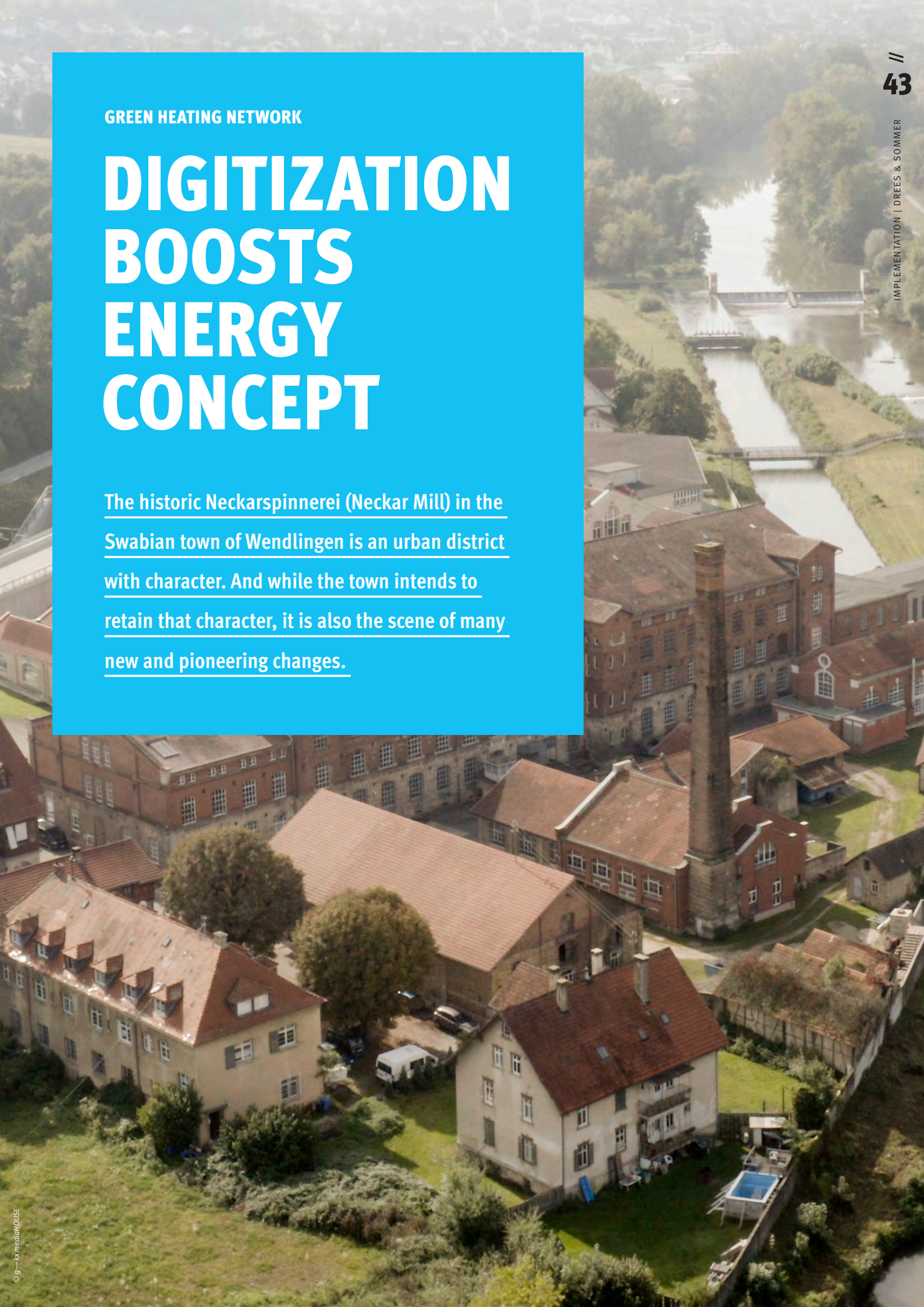
Patrick Elsässer
M.Sc.
Leading Consultant
Drees & Sommer SE

Patrick Elsässer, M.Sc., has been with Drees & Sommer SE since 2013 in the Energy & Sustainability division, and is currently Leading Consultant heading up Energy Management. His area of responsibility covers a wide range of applications – from the development of indoor climate and energy concepts and integrated system planning to technical monitoring and the resulting operational optimization. His work focuses on the energy-optimized and resource-efficient operation of buildings while at the same time ensuring a high level of user satisfaction. His daily mission and vision is to deliver technology that functions, benefits the environment and users, and has a positive impact.

GREEN HEATING NETWORK

DIGITIZATION BOOSTS ENERGY CONCEPT

The historic Neckarspinnerei (Neckar Mill) in the Swabian town of Wendlingen is an urban district with character. And while the town intends to retain that character, it is also the scene of many new and pioneering changes.



1861 is the year in which the future German Emperor Wilhelm I crowned himself King of Prussia and in which the American Civil War broke out shortly after the new US President, Abraham Lincoln, had been sworn into office. It is the year in which the German physics teacher Philipp Reis demonstrated the prototype of an apparatus that could transmit speech over distance with the help of an electric current – he called it a 'Telephon'. And it was also the year in which Otto Textil GmbH opened a revolutionary cotton mill in what is now Wendlingen am Neckar in the district of Esslingen.

The company produced special high-quality yarns for almost 160 years. People lived and worked on the site as there were residential buildings for the workforce next to the founder's villa. In the early days, the company generated energy from a run-of-river power plant on the River Neckar – initially mechanically, then electrically. Production was closed down in 2020 and the HOS Group (Heinrich Otto & Söhne) began to chart a course for the future. By 2027, as part of the International Building Exhibition 2027 (IBA'27), a vibrant mixed district with areas for living, working, research, food & beverage outlets, culture and commerce will be created in the Neckarspinnerei quarter.

Not just climate neutral, but climate positive!

The mostly heritage-listed buildings with their characteristic red-brick walls in the roughly five-hectare site will blend with modern conversions and new buildings to form a harmonious whole. The energy upgrade of the established buildings is a core part of the project, because on completion, the entire district will have a smart heating network that can meet its entire energy needs with renewable heating, cooling and electricity. But that's not all: The Neckarspinnerei also plans to defy the immense challenges involved and offset additional carbon emissions of up to 300 tonnes per year.

It will do this with a finely tuned energy concept comprising hydroelectric, photovoltaics, wastewater heat, heat pumps (using the surface water of the Neckar and a large ice store that also provides cooling) and a highly efficient low-temperature heating network. The historic buildings will be equipped with suitable insulation for heritage-protected buildings, surface heating and cooling systems and a sophisticated ventilation system. Andreas Decker, Managing Director of the HOS Group, describes it as a 'showcase for the green heating transition in existing buildings'.

Self-learning system

The model is exemplary in a number of ways. The Neckarspinnerei has been equipped with a specially developed IoT (Internet of Things) platform to support the energy concept and proactive carbon emissions reduction. Drees & Sommer and the Institute for Energy Efficient Buildings and Indoor Climate at RWTH Aachen University are behind the BOOSTER research project, which is part of the National 5G Energy Hub (N5GEH), a technology project for the energy transition being carried out by the Institute of Energy Technology at TU Dresden and the E.ON Energy Research Center at RWTH Aachen University.

The participants have set themselves the ambitious task of doing pioneering work. The Neckarspinnerei's energy concept is complex and must meet the highly diverse requirements of future users. This requires many cogs in the system to run like clockwork while meshing properly to ensure that the overall sociotechnical system does the same. Until now, however, it has been almost impossible to reconcile all the different aspects, because IoT applications often tend focus on specific subareas and exclude others. Because plant & equipment and sensors do not always communicate with each other in a systematic way. Because often, data cannot be reliably captured. The list goes on.


© Peter Otto

A jewel with history: For almost 160 years, Otto Textil GmbH in Wendlingen produced special high-quality yarn.

BOOSTER[1] aims to change that with the help of modern wireless technologies, data storage in a central manufacturer-independent cloud platform, and intelligent algorithms to analyze the data. The platform feeds its findings back to the plant & equipment, and the self-learning district becomes more efficient and economical over time. “All equipment in the Neckarspinnerei will be seamlessly digitally networked and coordinated, and continuously optimized during operation,” says Thomas Schild, an expert in energy and sustainability concepts at Drees & Sommer.

That’s real pioneering work! Because anything that works in the diverse, mixed-used Neckarspinnerei complex should also work elsewhere.

Thomas Schild
Dipl.-Ing. (FH)
M.B.A. Manager
Drees & Sommer SE

After completing a dual study program in supply engineering with an apprenticeship as a gas fitter and plumber at the University of Applied Sciences in Gelsenkirchen, Thomas Schild began his professional career in an engineering office for building services engineering as a specialist planner and project and construction manager. At the same time, he completed his studies in technical business management at the Bochum University of Applied Sciences. He contributed his expertise primarily to the development of real estate and building energy concepts. At the Department of Building Services Engineering and Energy Technology at RWTH Aachen University, he continued to gain experience and deepen his understanding of the operational management of energy systems and completed his energy engineering doctorate in the area of operational strategy development for integrated energy systems. Thomas Schild joined Drees & Sommer in 2019. As a manager in the field of engineering consulting, he now leads an Energy and Sustainability team that focuses on the Green Heat transition – including innovations covering all aspects of building refurbishment, the exploitation of digital potential for operational optimization, and the use of renewable energy sources.

[1] *BOOSTER stands for ‘IoT-Based Operational Optimization for SusTainable EneRgy systems’, BMWK (FKZ: 03EN1058A-B), https://n5geh.de/booster/*

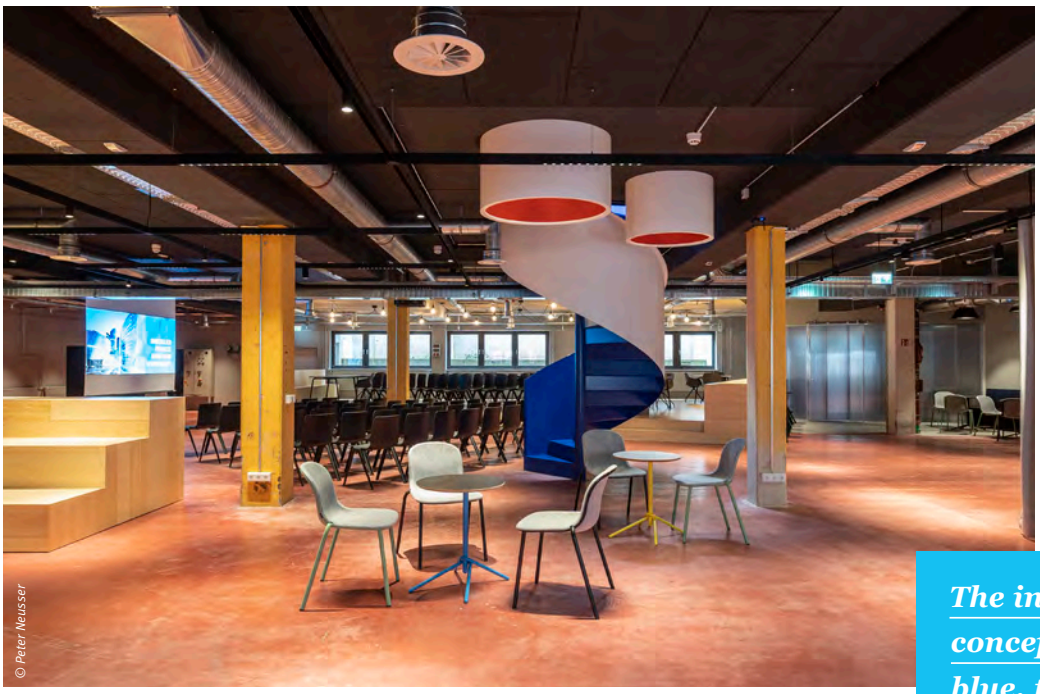
NEW WORK

HARMONIZING OLD AND NEW

Drees & Sommer has transformed a former industrial bookbindery into a digital innovation hub – without losing the atmosphere of the building's industrial heritage.

Dexterity, focus and a sense of esthetics are the qualities you need if you want to work in a bookbindery. Bookbinding is a craft with centuries of tradition and is considered an intangible UNESCO cultural heritage. Former and current bookbindery buildings bear witness to this. But the craft is in decline. The competitive pressure from digitization and globalization is huge, as is the cost pressure. Some bookbinderies still exist, of course – companies and the people behind them, who produce beautiful print products with great care and attention – but they are becoming increasingly rare, often because there is no one who wants to continue the business.

There used to be a commercial bookbindery in the Obere Waldplätze industrial precinct in Stuttgart-Vaihingen where Drees & Sommer is headquartered, but it did not survive the changing times. The building has a character typical of a medium-sized industrial company, including a red polished concrete floor and technical installations. In its original state, it didn't look like a suitable place for a laboratory to test future-oriented concepts. And yet that is exactly what it has become.


© Peter Neusser

The interior design concept combines red and blue, textiles and metallic materials with emotional and technical elements.


© Peter Neusser

What we created between 2017 and 2019 impressed not only the management team of Drees & Sommer and the juries of three architectural and design competitions in equal measure – but also the people who work in the building.


© Peter Neusser

Three architecture awards in one year

What we created between 2017 and 2019 was impressive. It impressed the senior management of Drees & Sommer, who saw their vision of cooperation in the DS Hub realized. It impressed the juries of three architecture and design competitions: The building won the 'Innovative Architecture' category at the Iconic Awards presented by the German Design Council, along with the 'German Design Award' in the 'Excellent Architecture – Interior Architecture' category, and the 'iF Design Award 2020'. And it also impressed the people who work in the building, who are all very familiar with technologies that hold great promise for the future. That is because the Innovation Center of Drees & Sommer has now moved into the DS Hub.

They and their guests – from startups, for example – now have a creative environment in the former bookbindery that allows a vison of the future without completely losing sight of the past.

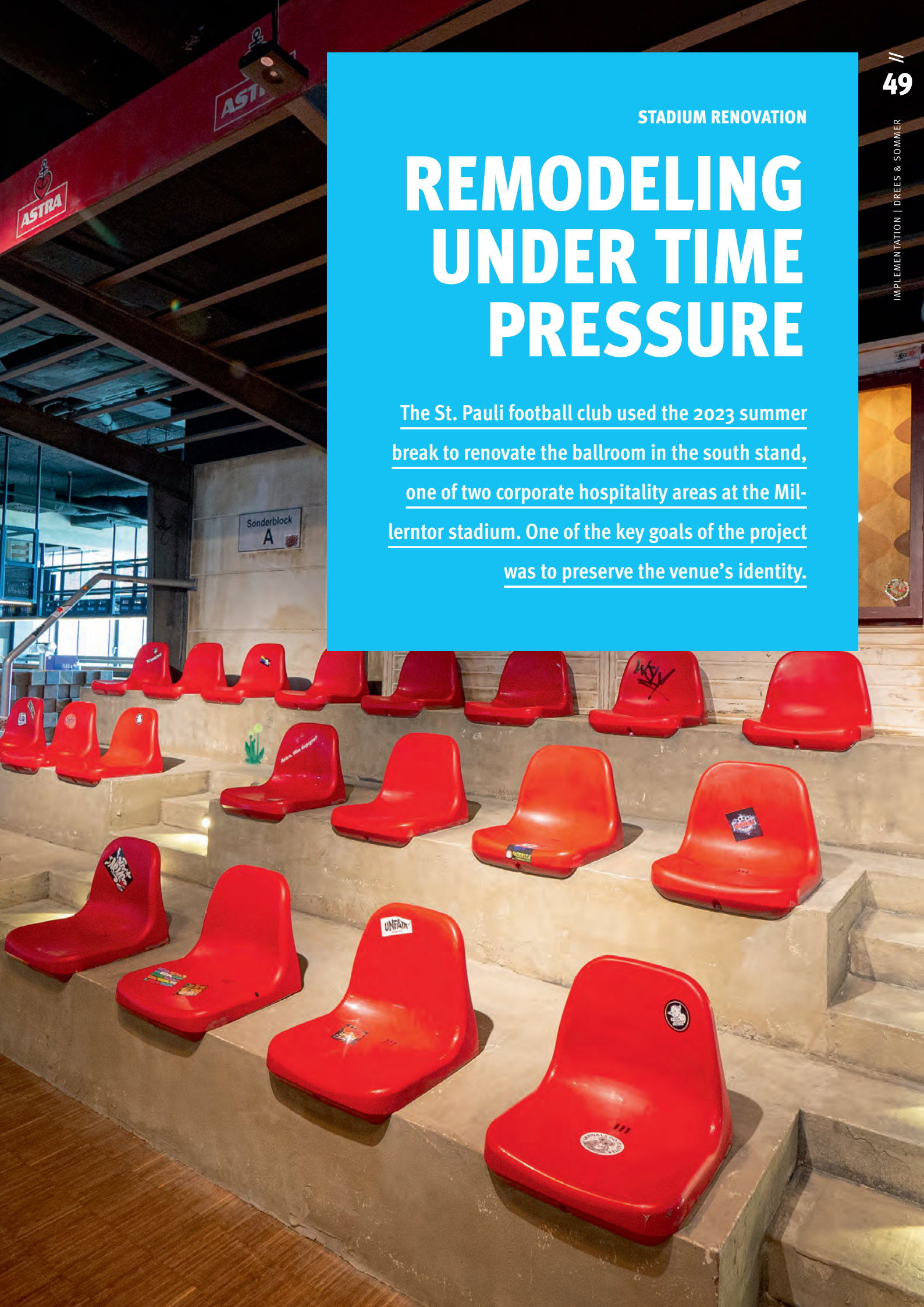
A dialog with history

Drees & Sommer purchased the three-storey building, which was built in the mid 1980s, as a quick and easy solution to meet the demand for new workplaces – and to showcase some of the services the company excels at: innovative building technologies, future-oriented work environments and sustainable building conversion. The task for Alexander Strub, architect and creative director at Drees & Sommer, was to harmonize the old and new, preserving what was worth preserving and integrating advanced concepts and technology. "We engaged in a sort of a dialog with the history of the building," says Strub, adding that this task was both a challenge and a stroke of luck for him and his team. He saw the 1,500 square meter industrial floor as a wonderful gift and left it completely untouched. The same applied to the characteristic concrete columns. Instead of being concealed, the building services equipment suspended from the ceiling was left clearly visible.

When it came to the color design, the New Work team set powerful accents – complementing and contrasting with the existing rough and unfinished surfaces. The result was a combination of red and blue, textile and metallic materials with emotional and technical elements. The spatial concept focuses on communication and exchange, while still offering retreat areas for focused work. The many plants throughout the building have a positive effect on the indoor climate and acoustics, and the furniture – including light chairs and tables with lockable castors – meet the demand for flexibility. It also shows the great importance attached to sustainability: Much of the furniture and fabrics in the building are made from recycled materials, in keeping with the principle of a sustainable circular economy.

Alexander Strub
Dipl.-Ing. (FH)
Senior Expert
Drees & Sommer SE

Until 2004, Alexander Strub worked as a self-employed architect and taught at the Munich University of Applied Sciences, before joining the EXPOLAB agency as Head of Design. From 2009 to 2012, he was a partner and executive manager responsible for spatial communication, design and architecture. In 2013, he moved to RBSGROUP to take up the role of Creative Director, combining the topics Brand Experience, spatial communication and New Work. Heading up a team of 15 designers, he was responsible for the continuous development of the group-wide philosophy of New Work and Brand Experience. At the beginning of 2021, RBSGROUP became part of Drees & Sommer SE. Alexander Strub has received numerous prestigious awards for his creative work.



STADIUM RENOVATION

REMODELING UNDER TIME PRESSURE

The St. Pauli football club used the 2023 summer break to renovate the ballroom in the south stand, one of two corporate hospitality areas at the Millerntor stadium. One of the key goals of the project was to preserve the venue's identity.

On February 6, 2002, a huge celebration got underway at Hamburg's Millerntor stadium. Newly promoted to the Bundesliga (national league), FC St. Pauli hosted the mighty FC Bayern Munich, the current league champions, Champions League winners and winners of the Intercontinental Cup (Toyota European/South American Cup) No one expected the home team to win. But they did – 2:1. And while a dismayed Bayern coach Ottmar Hitzfeld gave a television interview, the fans on the stands in the background sang "Oh, wie ist das schön" (Oh, how nice is that!). That same night, two fans had an idea for a T-shirt: 'Weltpokalsiegerbesieger', which translates as World Cup winner beaters. Over 120,000 are sold.

There are countless stories about FC St. Pauli, which show that the club from the Reeperbahn takes a somewhat different approach to the highly commercial world of football: It wants to achieve sporting success without abandoning its values, including diversity, clarity of purpose, and openness. Many of these stories are related to the fans and the stadium at the Millerntor, the place where the relationship between the team and its fans is most passionate, right in the middle of the red light famous district. Accordingly, preserving their identity was equally important to the FC St. Pauli when renovating their ballroom in the south stand.

Design à la St. Pauli: modern, rough, authentic

The renovation was initiated following complaints from the VIP guests that the ballroom was too crowded, especially during top games. So FC St. Pauli reduced the number of corporate tickets from 1,000 to 650 and introduced a new hospitality concept with better service. An innovative design concept, featuring the club's colors and using wood and metal, reflected both the change and the commitment to identity. Old metal rails, so-called crush barriers, form a setting for the newly built stage for interviews and live acts. The barriers were originally installed in the stadium, where fans had painted on them and covered them with graffiti and stickers.

A team from Drees & Sommer from Hamburg oversaw the conversion. The team was responsible for General Construction Management (GCM) and supported the club with general planning of the architecture and building services equipment, developing a new lighting concept, and providing project and construction management services.

The tight schedule was the biggest challenge during the planning, tendering, contract award and execution phases. The whole project had to be completed within seven months, but there were only two months available for the actual implementation on site – during the summer off-season. "The pressure was high right from the start and the project management was intensive. All trades were meticulously synchronized," reports Tristan Schmedes from Drees & Sommer, who was overall project manager for the remodeling. This was made possible by Lean Construction Management (LCM). Based on the principle adopted by the manufacturing industry, it ensures lean and agile construction projects. An additional advantage of LCM is that it helps to avoid wasting manpower and materials.

At St. Pauli, the stadium's VIP area is also looks a little different, in keeping with the soul of the club.

Delighted president

On the second match day of the new season in the second division of the Bundesliga in August 2023, the new ballroom in the south stand opened its doors for the first time: 29,546 fans at the sold-out Millerntor stadium watched a 0-0 draw against Fortuna Düsseldorf. FC St. Pauli's president Oke Göttlich was delighted with the result of the renovation: "Old St. Pauli stories and St. Pauli paraphernalia have been rearranged and integrated into the concept with great attention to detail. Wherever you look in the new South Ballroom, you can see the team has put its heart and soul into the renovation."

But it's not his opinion that is decisive, but that of the guests. Because their opinion will decide whether or not the club will tackle renovation of the second ballroom in the main stand during the next off-season. That represents an even greater challenge. The schedule would be equally ambitious – and the ballroom in the main stand is twice as big as its counterpart in the south stand. Tickets for it were highly sought after before the season even began: All 480 season tickets for the corporate seats are already sold out.

zum Video

Tristan Schmedes
B. Eng., M.Sc.
Senior Project Manager
Drees & Sommer SE

Tristan Schmedes studied industrial engineering with a focus on construction engineering at the Konstanz University of Applied Sciences and then completed his master's degree in construction engineering specializing in architectural engineering at HafenCity University Hamburg. He started his professional career at Drees & Sommer while still studying for his bachelor's degree. With a passion for sports, especially football, his professional focus is on development consulting for sports and high-volume venues as well as project control and leadership.

TURNING AN OFFICE INTO AN EMPLOYEE MAGNET

AN OFFICE LIKE A VILLAGE

Dormakaba, a company from the security and access solutions sector, is converting its former production hall into an office and wanted to revitalize the collaboration areas. Drees & Sommer was glad to help out.

It all began with a safe. In 1862, Franz Bauer founded a company for cash registers in Zurich, which later grew into a company called Kaba. Bauer's business got off to an excellent start, as the demand for safes was high: A new law in Switzerland had made it mandatory to protect business records from fire. 46 years later and about 600 kilometers to the north, Rudolf Mankel and Wilhelm Dörken founded a limited partnership in Ennepetal (North Rhine-Westphalia) that specialized in the production of swing-door hinges and later operated under the name Dorma.

Dorma and Kaba each set distinctive trends in the field of access control, security solutions and security services in German-speaking countries and, indeed, worldwide. Since the merger of the two companies in 2015, the group has gone from strength to strength. Today, it has 16,000 employees in 130 countries, has registered more than 1,800 patents for products and software, and produced some 150 million closing devices since the 1950s. The company motto is 'For every place that matters'.

A work environment that inspires

Dormakaba Holding AG is headquartered in Rümlang in the Swiss canton of Zurich. Its 6,630 square meter production hall next to the old office building had fallen out of use following the relocation of production. So Dormakaba fitted it out in accordance with the standards of the Swiss Minergie certificate for office space, and installed cubicles. But something was missing – a customized concept that would turn the hall into an employee magnet. The company decided to turn previously empty areas into collaboration spaces with an attractive design.

And that is how the experts from Drees & Sommer's 'New Work – User-Centric Consulting & Design' division got involved. They won the design competition and were commissioned to create an inspiring and sustainable work environment that brings Dormakaba's corporate culture to life. The concept was based on the premise that 'Every user needs a small town'. The team took inspiration from various contact points and community facilities in the local community of Rümlang and developed the concept of a multi-zone urban ecosystem.

A 'pocket park' was created in the middle of the hall, acting as a green lung with plants and providing informal seating for focused work and mutual exchange in a healthy, relaxed atmosphere. The marketplace in the entrance area features a barista bar. There is an Open Huddle with open and closed collaboration spaces, and a focus area that has a reading room atmosphere. Equipped with modular furniture systems, the arena at the rear of the hall is ideal for brainstorming sessions or – thanks to its size – for company-wide events. And finally, the Quiet Booth is a place for relaxation and meditation, for praying, switching off and alone time.

Step by step to an inspiring vibe

What began with a requirements analysis accompanied by precise change management continued with a compass workshop to define goals and a co-creative workshop to develop the specific design. Collaborating closely with Dormakaba, Drees & Sommer developed a concept that was positively received precisely because it involved all stakeholders while leaving room for imagination. The etiquette for the individual zones and the collaboration area was determined by the employees themselves.

"Every user needs a small town." The concept of an urban ecosystem with multiple zones was inspired by various contact points and community facilities in the local municipality of Rümlang.

© Arnold Weihs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The result is something to be proud of. The old industrial atmosphere still pervades the former production hall, but is now combined with warm and natural elements of interior design, including colorful fabrics, wood and plants. And it is very popular! There has been a marked increase in the occupancy rate of the innovative work environment – as well as in the morale of the 300-odd employees. Susanne Marchesi from Dormakaba compares the new office environment to a village where you have many opportunities to meet and exchange ideas, and in which you can find the ideal space and atmosphere for any activity. Something for everyone!

The etiquette for the various zones and the collaboration area was determined by the employees themselves.


© Arnold Weihs

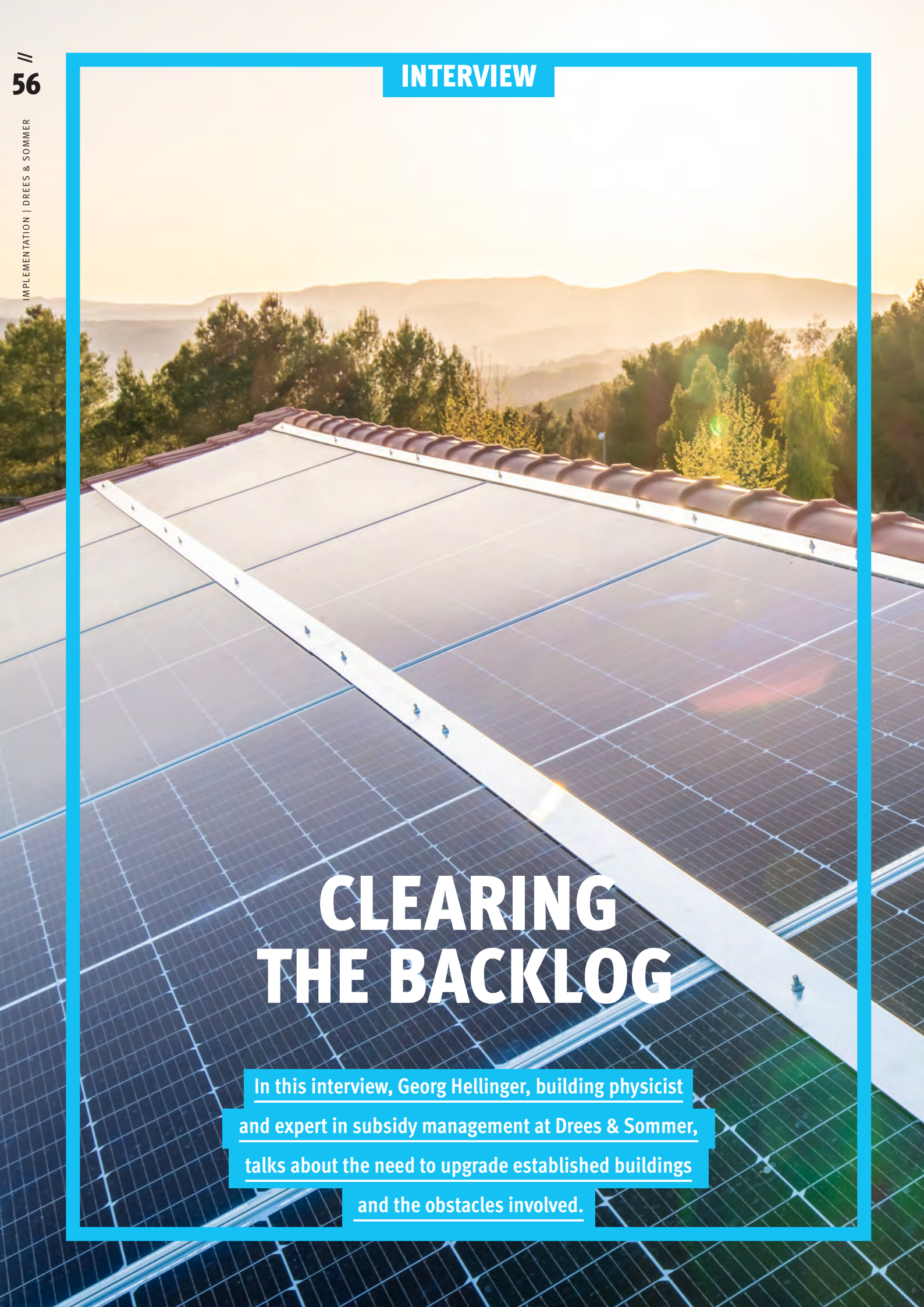
Johanna Trüstedt
Leading Consultant
Drees & Sommer Schweiz AG

During her more than 20 years of work experience, Johanna Trüsted has designed and managed office and fitout projects in Germany, Japan, China, Spain and Switzerland. Through her international project experience, she has become exceptionally competent at managing multicultural teams of project participants and has further enhanced her skills in the development of utilization concepts, execution planning and creative site management.

Her priorities are finding the ideal solution for the customer and creating interiors that promote a feeling of well-being and the health of users. She firmly believes in good communication throughout the project in order to create consensus between all the participants and thus achieve the ultimate project goals.

Ms. Trüstedt has been a consultant in the Workplace Consulting department at Drees & Sommer since 2016, where she is responsible for the development of utilization concepts, space planning and innovative interior design. She is our go-to expert on sustainability and our Cradle to Cradle approach with a focus on indoor air quality and material transparency.

INTERVIEW



CLEARING THE BACKLOG

In this interview, Georg Hellinger, building physicist and expert in subsidy management at Drees & Sommer, talks about the need to upgrade established buildings and the obstacles involved.

When building physicist Georg Hellinger inspects properties in need of renovation, he often sees the dramatic results of decades of patchwork maintenance. Such buildings, he says, need urgent systematic refurbishment. Here, he talks about the ecological and economic aspects of renovating established buildings and illustrates how this work can be done while the buildings remain in operation.

Mr. Hellinger, in Germany there is talk of a renovation backlog for established buildings. Can you provide some figures for that?

Even though similar problems exist in all types of real estate, the situation can best be demonstrated with residential buildings. We have 19 million detached and semi-detached houses in Germany, as well as 22.2 million apartment buildings. Of these, 16 million are unrenovated, affecting about 42.5 million residential units. The current renovation rate is around 500,000 residential units per year, that is, about one percent. If we continue at this pace, there is no way we will achieve the goal of having a climate-neutral building stock by 2045.

What are the key reasons for this renovation backlog?

Inertia is certainly one factor. Another is the lack of political pressure. The government can only increase requirements related to climate protection and the energy transition for new buildings. It cannot extend this to building stock, as it is difficult to justify and enforce regulations on established buildings. The main reason, however, is that for a long time refurbishment was simply not economically viable because energy costs were relatively low and the necessary investment would not have paid off.

And that is now coming back to bite us?

We need to differentiate and take into account the large differences in ownership and ownership structures. An owner-occupier who is able to invest and who finds that it will save energy and at the same time allow them to live more comfortably will probably refurbish. But a different scale applies to the vast majority of real estate, as most is rented or leased, whether the buildings belong to individuals or to portfolios and funds. The owners want tomorrow's rental agreements to be as secure and economically viable as today's. So in addition to location, amenity and flexibility, energy consumption is a key factor for them. Investors have an interest in bringing their existing properties up to new-build level in order to remain competitive in the future.

How does the renovation backlog manifest itself in buildings?

The situation is often dire. When we inspect large buildings dating back to the 1960s and 1970s, we sometimes come across properties that are so dilapidated that they are on the verge of being inoperable. Decades of use take their toll on pipes, cables and technical systems, especially if, as is often the case, they have only been repaired, rather than renovated, since the building was constructed. We are then dealing with technology that needs to be replaced – and this applies not only to the generation and distribution of heating, cooling, ventilation and lighting, but also to the transfer systems, such as radiators in the rooms themselves. Everything is run down, nothing is state of the art. If you want to have a building that is serviceable in the long term and in which users feel at home, you have to take a systematic approach to maintenance.

When you tell property owners that they need to renovate their building, do they throw up their hands in dismay and say that, in that case, they would rather build a new one?

That sometimes happens, yes. But experience shows that if you take a sensible strategic approach and renovate progressively over a period of, say, ten years, you can do it in a way that is operationally less disruptive and is more cost-effective than a new building. And it is certainly more eco-friendly. And for a variety of reasons, more and more investors consider it important to embrace true sustainability, even if this approach is initially more expensive than a new building. They take a look at their portfolio, have deconstruction studies carried out and disposal concepts drawn up and analyzed: What if we demolish all or part of this building and what does that mean for the lifecycle assessment? They then quickly establish that renovating the existing building would result in carbon emissions between 33 and 50 percent lower than a replacement building.

You mentioned ‘less disruptive for operation’. Are you saying that progressive renovation over time has the advantage over complete renovation that the property does not have to be vacated for an indefinite period?

Exactly. There is a whole range of options for partial revitalization. For example, I can simply install a new sealed and insulated roof and mount a PV system on top. Normally, I can make all of these sustainability improvements without impacting the interior of the building. Or I can replace the old gas boiler with a new condensing boiler system, perhaps combining it with solar collectors to augment the hot water supply or the heating system with solar hot water. This may require installing a new shaft, but that is a comparatively minor intervention. A third example is the conventional total window replacement. This can also be done in a way that is minimally invasive. It is purely a question of logistics – for residential areas, it’s all over in no time. It takes a little longer in office properties. Sometimes a wing of the building has to be temporarily vacated, but it is still quite feasible with the building still in operation.

Contacts for subsidies (excerpt)

- Kreditanstalt für Wiederaufbau (KfW): Founded in 1948 to finance reconstruction after the Second World War, KfW is now dedicated to making Germany sustainable and resilient. Various programs are tailored to the type of property and the scale and design of measures.
- Federal Office of Economics and Export Control (BAFA): BAFA's activities include subsidizing companies to make investments that increase the efficiency of industrial and commercial plants and processes, and thus conserve resources.
- Landwirtschaftliche Rentenbank: As part of the 'Energy from the Land' program, companies in the agricultural and food sector (including farmers) receive subsidies of up to 100 percent if they invest in the generation, storage and distribution of renewable energy.
- Programs in the federal states: Banks and government institutes in many of the federal states operate programs. These include NRW.BANK; the Senator for Climate Protection, Environment, Mobility, Urban Development and Housing Construction, Bremen; Investitions- und Strukturbank Rheinland-Pfalz (ISB), and the Landeskreditbank Baden-Württemberg.
- Programs at the local authority level: Cities and municipalities also have programs, both for private individuals and companies, for example for photovoltaics and heat pumps.

What subsidies are available, regardless of the type of renovation?

More than I can list in a short answer. Following the Federal Constitutional Court ruling on the Climate and Transformation Fund in November 2023, we told nervous customers not to panic and to let the politicians do their thing for now. Because after all, the goal is for the building stock to be climate-neutral by 2045. And since established buildings offer the greatest scope for improvement, the subsidy landscape in Germany is much more focused on refurbishment than on new buildings. And subsidies are available that cover between 15 and 30 percent of investment.

Do you have the impression that sometimes a lack of imagination and determination stands in the way of renovations?

Yes and no. At Drees & Sommer, we are very innovative and therefore have to deal professionally with a lot of creative and willing people who know that there are many to achieve a goal. On the other hand, some people's opinions about the energy transition make me think that we, as a society, are still 50 years behind. There are far too many emotional responses. The start of the war in Ukraine gave everyone a big shock because people were suddenly afraid that oil and gas supplies would dry up. Many people bought emergency generators. But as soon as the fear subsided a bit, they went back to business as usual. And people started to say that the cost of the energy transition was just too high. I don't think that we, as a society, are really take the problem seriously.

Nevertheless, what makes you confident that we will be able to overcome the renovation backlog?

When we are stuck in congestion in our car, we are surprised that one minute we are crawling along and the next we are driving at 100 kilometers per hour. The building market in Germany is complex, but there is not a single building that cannot be renovated. There is a suitable technical solution for every building. If we can harness motivation, economy and a focus on implementation, we can take huge strides towards a climate-neutral building stock within just a few years.

Georg Hellinger
Dr.-Ing., Team Leader
Drees & Sommer SE

Georg Hellinger is committed to a sustainable and livable future – not least because he thinks about the future of his three children. Hellinger's range of expertise includes thermal building physics, thermal bridge optimization, building and room acoustics, and noise pollution control. He developed the 'Planning Atlas of Building Construction' for the German cement and concrete industry, and as a lecturer in building physics and BSE (building services equipment) at Dortmund Technical University and the Cologne University of Applied Sciences.

R CONCRETE

WASTE NOT, WANT NOT!

An urban quarter for the future is being built on the Vinzenz campus in the city of Wangen im Allgäu – with the help of the past. In 'concrete' terms: Through the recovery & recycling of concrete rubble as a secondary raw material.

Rich in tradition, vibrant and a medieval jewel that offers quality of life here and now – that's is how the city of Wangen im Allgäu sees itself. And this self-image is reflected in the Vinzenz campus. In the western district of Berger Höhe, located both close to the forest and to the old town, construction company Georg Reisch GmbH & Co. KG and the Vinzenz von Paul gGmbH charity (St Vincent de Paul) are each building three apartment buildings with a total of 122 residential units for families, singles, couples and for senior-friendly living in a project that connects generations. A district square and various encounter and activity offerings both inside and out will bring people of all ages together.

At least that's how the two developers imagine it will be. In the past, the site was dominated by a monolithic fair-faced concrete building dating back to the late 1970s which accommodated a St Vincent de Paul care facility. It had to go. The developers had hoped to be able to renovate the building in an economically and environmentally sound way but the state home building regulations as well as fire protection and energy efficiency requirements ruled this out. They were only able to save an old chapel as integral part of the new quarter.

Nothing goes to waste

This meant that the district developers were faced with the question of how to avoid their commitment to the responsible use of resources becoming mere lip service as a result of demolition and new construction. So they set themselves the goal of recycling as much as possible of the concrete rubble, as the existing building held the potential of around 15,000 tonnes of secondary raw material – material that could easily be used in new projects elsewhere. Admittedly, the material would be of lower quality and used for projects such as road construction in keeping with the downcycling principle.

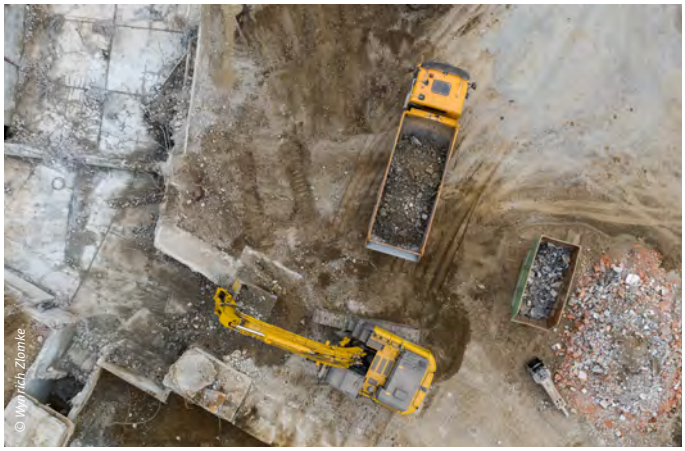
Following several investigations, processes were developed that made it possible to recycle the remains of the old building with no loss of quality, in accordance with the best urban mining principles. Once impurities had been removed, the R concrete (resource-saving concrete) was used in several places: in the supporting structure, as fill for improved sound insulation and – in a real innovation – as screed. To achieve this, Reisch started a cooperative venture with the Faculty of Civil Engineering at the University of Applied Sciences Konstanz (HTWG). This resulted in a substantial overall reduction in carbon emissions as it saved hauling some 650 tipper semitrailers of primary raw materials such as gravel to the site from a pit in the region.

EPEA Gmbh – Part of Drees & Sommer was also on board the Reisch innovation boat, contributing to the development of the ecological goals for the materials and to the implementation of the necessary measures, advising on the selection of sustainable materials and preparing a Circularity Passport® for the buildings. This paves the way for the buildings to be raw material repositories – like the legacy building but on an even larger scale.

Knowledge gained is a future asset

Although they all meet the KfW40 Plus standard and have the same floor plans, each of the three buildings built by Reisch uses a different construction method. Based on the development processes for the timber building and the two timber-concrete hybrids, Reisch wanted to gain insights into which construction method is most likely to best solve the challenges of our time. For example, the floor slabs in Building 1 were not poured on site, as is usually the case, but are prefabricated reinforced concrete floor elements joined in a way that allows them to be dismantled intact.

With this project, the company has demonstrated what responsible, future-oriented reconstruction of legacy buildings can look like. So the company is 'well-placed' on the Vinzenz campus in Wangen – at least according to the life motto of St. Vincent de Paul: "Love is action." In other words, love should be expressed by deeds.



Andrea Heil
Senior Consultant
EPEA GmbH – Part of Drees & Sommer

Andrea Heil studied civil engineering at the Technical University of Munich. After completing her master's degree, she began her professional career in the City of Munich Construction Department. There, she developed the areas of regenerative construction and grey energy as well as the associated assessment criteria and controlling structures. She supervised Cradle to Cradle pilot projects as well as projects involving the use of recycled concrete and the reuse of components purchased from construction materials exchanges.

She has worked in the Cradle to Cradle Real Estate area of EPEA GmbH – Part of Drees & Sommer since 2021, and a Senior Consultant since 2023. She works on solutions to turn material and resource flows at the building and city levels into closed cycles. Her area of responsibility is the development of regenerative, flexible and healthy buildings and infrastructure and the associated Circular Economy opportunities for the construction and real estate industries. She also supervises a growing number of urban mining projects that focus on using building materials and components from demolitions or recycling with minimum loss of quality.

SUMMARY

A PASSION FOR PROPERTIES

Let's start this summary with an insight that may seem confusing at the end of a publication entirely devoted to the goal of promoting the benefits of renovating existing buildings. Namely, that refurbishment of building stock is not always the optimal solution.

But before you angrily slam this dossier shut and dismiss reading it as a waste of time, let's quickly add the following qualification: A refurbishment of existing buildings can be the optimal solution: economically, certainly environmentally, and for many other reasons. So if you are faced with the choice of a new build (possibly even after demolishing an old building) or revitalizing an existing one, don't rush to the seemingly simple solution of building from scratch. Weigh up the situation with the help of experts who can tell you the pros and cons of the various options.

We didn't call his dossier 'A passion for properties' just for the play on the word properties, but because we wanted to allude to the fact that the one can be passionate about optimizing the properties of refurbished building. So the connection between passion and optimization is not at all arbitrary. We must all make our separate personal contributions as we strive for a future that is climate-neutral – or even better, climate-positive. And in view of its massive carbon footprint and enormous consumption of resources, the construction and real estate sectors have a particular responsibility. Less construction means fewer carbon emissions.

This is the environmental aspect, but it is closely linked to the economic aspect. Awareness that existing buildings can be treasure troves in the form of raw material repositories is steadily growing, and the possibilities for analyzing building stock are constantly improving. Embedded materials don't have to automatically become future waste, but can have lasting value under certain conditions. Future-proof energy concepts, with electricity and heat from renewable sources, have long been as easy to implement in existing buildings as in a new building.

These are the takeaways of this dossier. The exemplary projects we have presented cover a whole range of industries and use cases in all project phases, and yet they represent only some of the projects our refurbishment experts are involved in. There are no one-size-fits-all solutions, but the basis for good solutions is always the same: Expertise, experience and a plan tailored to specific needs and challenges that must then be systematically implemented.

But regardless of how far your deliberations regarding a possible renovation of your existing building have progressed and what you would like from us – whether simply stimulating input or comprehensive project support and execution including planning services and construction management – we look forward to hearing from you.

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