

DREES & SOMMER GROUP

ANNUAL REPORT **2022**



**DREES &
SOMMER**

GROUP OPERATING RESULT 2022

PROFIT AND LOSS STATEMENT

| | (in euros) | |
|---|-------------------|-------------|
| 1. Revenues | 503,066,946 | |
| 2. Change in work in progress | 196,578,925 | |
| 3. Other operating income | 4,022,986 | 703,668,857 |
| 4. Expenditure for purchased services | 89,951,341 | |
| 5. Personnel expenses | 398,519,750 | |
| a) Wages and salaries | 347,502,663 | |
| b) Social security costs and pension fund | 51,017,087 | |
| 6. Depreciation | 16,160,334 | |
| 7. Other operating expenses | 113,490,477 | 618,121,902 |
| 8. Income from shareholdings | 1,465,113 | |
| 9. Income from other securities and from long-term loans | 733,727 | |
| 10. Interest and other expenses | 3,014,800 | -815,960 |
| 11. Operating result | 84,730,995 | |
| 12. Taxes on income and earnings | 27,853,173 | |
| 13. Other taxes | 201,300 | 28,054,474 |
| 14. Net income | 56.676.521 | |
| 15. Shares held by other shareholders | -50,191 | |
| 16. Profit brought forward less dividends | 26,420,437 | |
| 17. Changes in equity as the result of purchase or sale of own shares | 3,566,007 | |
| 18. Group balance sheet profit | 86,612,773 | |

PROFIT AND LOSS STATEMENT

Group sales grew by €129.2m to €703.7m (prior year: €574.5m). Expenditure rose by €113.8m to €618.1m in the year under review (prior year: €504.3m). Operating profit rose by €15.9m to €84.7m, with net income of €56.7m.

BALANCE SHEET

The reconciliation of retained earnings of €86.6m to equity, together with the subscribed capital, capital reserves and retained earnings, results in equity of €128.0m. The equity ratio is 38.5%. Accruals for pensions, taxes and variable remuneration rose by €1.6m to €102.2m. Liabilities, such as to suppliers, subcontractors and taxes, increased by €3.0m to €49.4m. Advance payments received on orders fell by €58.7m to €27.6m due to invoice timing. Liabilities to banks fell by €0.9m to €15.4m. In 2022, further profit participation rights were issued as part of the employee participation scheme. These are presented as bonds in the amount of €9.5m.

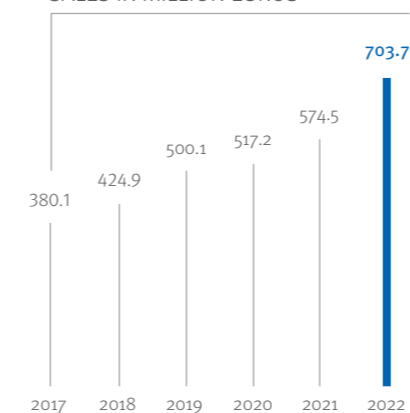
Overall, total assets for 2022 amounted to €332.5m (prior year: €357.9m).

BALANCE SHEET

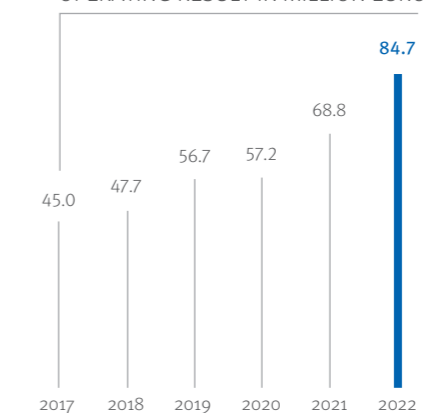
| | (in euros) | |
|---|--------------------|--|
| ASSETS | | |
| A. Fixed assets | | |
| I. Intangible assets | 37,187,483 | |
| 1. EDP software, licenses | 13,369,366 | |
| 2. Good will resulting from capital consolidation | 23,818,117 | |
| II. Tangible assets | 59,796,494 | |
| 1. Land, rights equivalent to real property rights, and buildings | 29,202,099 | |
| 2. Other assets, operating equipment, fixtures and fittings | 26,949,599 | |
| 3. Payments on account and tangible assets under construction | 3,644,796 | |
| III. Financial assets | 24,036,163 | |
| 1. Shareholdings | 23,157,346 | |
| 2. Other securities lending | 878,817 | |
| B. Current assets | | |
| I. Inventories | 0 | |
| 1. Work in progress | 950,353,018 | |
| ./. Advances received | -950,353,018 | |
| II. Receivables and other assets | 108,029,731 | |
| 1. Trade receivables | 88,288,115 | |
| 2. Receivables from shareholdings | 1,423,082 | |
| 3. Other assets | 18,318,534 | |
| III. Securities | 10,032,589 | |
| 1. Other securities | 10,032,589 | |
| IV. Checks, cash on hand, cash in banks | 83,136,988 | |
| C. Deferred income (other) | 6,627,327 | |
| D. Prepaid taxes | 3,617,000 | |
| E. Positive difference from asset allocation | 0 | |
| Balance sheet total | 332,463,775 | |

| | (in euros) | |
|---|--------------------|--|
| LIABILITIES | | |
| A. Equity | | |
| I. Subscribed capital | 26,444,572 | |
| less nominal value of treasury shares | -256,526 | |
| II. Capital reserves | 12,936,138 | |
| III. Revenue reserves | 974,100 | |
| IV. Net income | 86,612,773 | |
| V. Change in equity due to exchange rate difference | 1,526,899 | |
| VI. Minority interests | -205,212 | |
| | 128,032,744 | |
| B. Accruals | | |
| 1. Accruals for pensions | 3,140,409 | |
| 2. Provisions for taxation | 23,008,029 | |
| 3. Other accruals | 76,032,159 | |
| | 102,180,597 | |
| C. Liabilities | | |
| 1. Bonds | 9,523,188 | |
| 2. Liabilities to financial institutions | 15,418,717 | |
| 3. Payments received on account of orders | 27,607,291 | |
| 4. Trade payables | 19,831,540 | |
| 5. Liabilities to shareholdings | 0 | |
| 6. Other liabilities | 29,557,431 | |
| | 101,938,167 | |
| D. Deferred income (other) | 312,267 | |
| Balance sheet total | 332,463,775 | |

SALES IN MILLION EUROS



OPERATING RESULT IN MILLION EUROS



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703.7
MILLION EUROS
SALES

84.7
MILLION EUROS
OPERATING
RESULT

38.5 %
EQUITY RATIO

> 5,100
EMPLOYEES

59
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The Supervisory Board of Drees & Sommer: Chairperson Dr. Johannes Fritz (photo),
Deputy Chairperson Dr. Bernd Gaiser, Yvonne Allner, Eva Dietl-Lenzner, Dr. Jürgen Laukemper and Dr. Axel Sommer



“We achieved another very good year in 2022 – despite international crises and challenging economic conditions.”

Dr. Johannes Fritz,
Chairperson of the Supervisory Board
of Drees & Sommer

The Supervisory Board of Drees & Sommer began a new chapter at the end of 2022. The long-time Chairperson of the Supervisory Board and co-founder of the company, Prof. Dr. Hans Sommer, resigned from his post on December 31 following careful consideration and planning. The Supervisory Board would like to thank him on its own behalf and that of the company for his commitment and his achievements. Clients, staff and shareholders have all benefited hugely from Dr. Sommer's untiring work and vision. The Supervisory Board and the Partners have appointed him Honorary Chairperson as a sign of their gratitude.

The baton was passed on January 1, 2023 to Dr. Johannes Fritz, who knows the ins and outs of the company well from his many years of work on the Supervisory Board. Dr. Sommer and Dr. Fritz, along with the Executive Board, also used 2022 for a thorough handover of organizational tasks and content-related issues. The work of the Supervisory Board continues to consist of monitoring that of the Executive Board and the company – primarily in the role of an advisor.

Drees & Sommer recorded further growth again in 2022 despite the difficult general conditions. Although international crises and the intensifying political and economic conflicts made themselves felt on the markets, Drees & Sommer managed to build on its very good position in the sector by innovations – for instance in the area of digital transition and transformation – and by its ongoing policy of entry into selected growth markets. As well as continuing its organic growth, Drees & Sommer SE also grew by domestic and cross-border mergers. Particularly noteworthy were the business combinations with the Stuttgart-based macomGROUP and with AAPProjects in the United Kingdom. The advantage for clients is that they have access to a wider range of services, in addition to optimum technical support and manpower locally. They can also quickly avail of the expertise of the entire Drees & Sommer Group at any time.

Annual Financial Statements and Consolidated Financial Statements for 2022

The audit firm Baker Tilly, which was appointed at the General Meeting of Shareholders as auditor of the financial statements for 2022, audited and issued an unqualified opinion on the annual financial statements and the consolidated financial

statements for 2022, which are prepared in accordance with the German Commercial Code (Handelsgesetzbuch – HGB). The annual financial statements and the consolidated financial statements, along with the management reports, were discussed in our meeting on May 22, 2023 in the presence of the auditor. The auditor gave a report on the scope, the focus and the significant findings of the audit and answered remaining questions. The Supervisory Board approved the financial statements and the management reports.

The Supervisory Board also approved the proposal of the Executive Board that a dividend of EUR 1.45 per share be paid out of the retained profit of EUR 77.5 million and to carry over the remaining amount to the new accounting period. Our decision took into account the company's current financial and earnings position, the medium-term financial and investment planning and the interests of the shareholders.

The Supervisory Board wishes to thank the Executive Board, the Partners, and all the management and staff for their great commitment over the past year, without which it would not have been possible to achieve such successful results in this challenging market environment.

Outlook for 2023

The new year brings many opportunities, for instance in the area of energy transformation – including the design and construction of the necessary manufacturing plants and infrastructure. There are also very good growth prospects for the resource-saving upgrading of existing building stock. However, there is also continuing uncertainty in the global financial and economic environment.

The Executive Board, Partners and staff are working to make 2023 another successful year. They will continue to work closely with the Supervisory Board to achieve this.

Stuttgart, Germany, May 22, 2023

Johannes Fritz
Dr. Johannes Fritz

AGILITY IN THE DNA



Partners and Executive Board members from left: Dierk Mutschler, Steffen Szeidl (Speaker of the Executive Board), Marc Schömbbs

Major changes in the markets, increased interest and inflation rates, and supply bottlenecks for materials presented major challenges in all sectors of the economy in 2022. The fact that the Drees & Sommer Group can look back on a successful year despite these conditions is due to the agility and innovative strength with which the company meets such challenges.

The strength of the development in almost all areas is reflected in our figures: sales increased by 22.5 percent year-on-year to EUR 703.7 million, while the operating result rose to EUR 84.7 million.

At its core, agility is about a company's ability to respond quickly and flexibly to new challenges and changing conditions. Truly agile companies act proactively. They seize opportunities as they arise instead of passively waiting for a reaction to become necessary. At Drees & Sommer, this attitude is deeply anchored in the corporate DNA and is reflected in a wide range of areas: in the development of new markets, the establishment of strategic partnerships, the targeted further development of forward-looking service profiles for our clients, and not least in the sustainable transformation of our own organization.

Targeted expansion with strategic participations

In addition to ensuring high performance in our core business, we need to unleash creativity and diversify with foresight in order to open up new markets and expand our range of services. To this end, we have acquired strong international and national shareholdings.

In the United Kingdom, Drees & Sommer has taken over all shares of the real estate and construction consultancy AA Projects. Together we now can serve clients at seven locations in the UK. Our focus is on consulting services for modular, sustainable, and intelligent buildings. In order to further expand our pioneering role in the digital transformation of the real estate industry, we are relying on the company Macom, which is established throughout Europe as a specialist in integrated media technology and IT solutions for working, learning and experience environments.

In Austria, PM1 is strengthening Drees & Sommer's construction expertise. Together, the service portfolio is now being expanded with regard to overall execution throughout Austria.

REPORT OF THE EXECUTIVE BOARD

STEFFEN SZEIDL, DIERK MUTSCHLER AND MARC SCHÖMBS

As a competence extension in the area of civil engineering, we have brought on board Hamburg-based LV Baumanagement, which also contributes specialist knowledge in flood control and geothermal energy. At the same time, we are systematically continuing our growth course in Scandinavia with the Swedish company GoToWork and are strengthening our expertise in the fields of user experience and new work.

We have a proven and trusting relationship with all these companies. By joining forces, we want to continue to drive innovation in an industry that is often still perceived as „oldschool“, discover trends and thus lead projects to success for our customers – in keeping with our special Dresco spirit. With us, everyone can contribute topics and implement ideas. Cooperation instead of competition, together instead of against each other. „Right Mix - Real Value“ applies not only to our services in projects, but also to the people who realize them. In May 2023, we therefore joined the „Diversity Charter“ employer initiative. Within the company, we have always been committed to an organizational culture characterized by openness, mutual respect and appreciation. Signing the charter was therefore a logical next step.

As a diverse and enthusiastic team, we focus on interdisciplinary cooperation and, above all, on implementing comprehensive solutions for our customers. In doing so, we also always pay attention to reducing the CO2 footprint in our projects and in our own company.

Circular economy instead of ecological one-way

The construction and real estate industry is still struggling with that point in particular. But anyone who only considers sustainability from a purely microeconomic perspective fails to recognize the seriousness of the situation. We have long been heading into a storm of resource scarcity and man-made climate change. Instead of waiting for regulation, we must rely on our own initiative and radically rethink the built environment to keep it livable for future generations. To do this, our ecological one-way streets must give way to (traffic) circles. The building sector in particular offers great potential: in Germany alone, 15 to 16 billion metric tons of raw materials are used. If these buildings had a material passport, as is now planned by the German government, many valuable raw materials could be reused during conversion or demolition. And this is by no means a distant dream of the future: Our subsidiary EPEA has been producing such certificates in form of Circularity Passports for over eight years and has tested them in over 80 projects. Together with our associate, Werkbank IT, an IT

company specializing in BIM, EPEA is now simplifying the life cycle assessment of buildings. In the newly developed Greentech solution called BIM & More Metronome, the digital twin calculates the circularity and life cycle assessment of buildings for the first time. This enables architects and planners without any special prior knowledge to evaluate individual components and entire buildings according to ecological criteria. This provides numerous project teams with a digital everyday helper to lead the built environment into a sustainable and resource-saving future.

Potential in existing buildings

While we are already planning and optimizing the energy efficiency of many new buildings, the greatest potential lies in existing buildings. In the European Union, buildings account for around 40 percent of energy consumption and greenhouse gases. At the same time, the current renovation rate is stagnating at around one percent, even though more than three quarters of buildings are getting on in years. If we really want to make the EU climate-neutral in accordance with the Green Deal, large housing associations and real estate companies must not slacken their efforts to implement concrete decarbonization plans, especially now. Here, the public sector is also called upon to think sustainably about buildings and, above all, mobility. The city of Wiesbaden is setting a good example by making its infrastructure fit for the market ramp-up of e-mobility. Based on the findings of this pioneering project Drees & Sommer has developed a guideline that will also help can support municipal decision-makers throughout Germany in this mammoth task.

High-tech “Made in Germany”

And industry is also facing transformative tasks: Raw material bottlenecks and fragile global supply chains continue to plague the industry. For many major players in the high-tech and production industry, „Made in Germany“ is once again becoming an interesting business strategy. Our teams have already completed major projects, and the next ones are already in the starting blocks.

Awarded for Change: ESG Transformation Award

We have developed an ESG Toolbox for both our clients and ourselves that makes ESG reporting clearer, preserves knowledge and makes it easier to set up a data-driven strategy for this important area. With just a few clicks, the toolbox





provides a detailed overview of the current state of a property and the greatest potential for optimization. Planned activities can also be broken down by cost and CO₂ savings. This makes it possible to see at a glance which measure has the best cost-benefit ratio. In addition, the ESG Toolbox is suitable for a wide range of applications – from simple checklists to complex ratings with thousands of differently weighted criteria to ESG management at the corporate level.

The best way for us to prove what is sustainable and economically viable for our customers is to demonstrate it ourselves: At the end of April 2023, Drees & Sommer received the ESG Transformation Award, and ranked first place in the Transformation of an Organization category. The prize was awarded this year for the first time, with the aim of identifying pioneering ESG initiatives and encouraging others to emulate them. All this is only possible for us as a company because our employees face up to all new challenges on a daily basis with a great deal of motivation, innovative strength and energy. We would like to thank all our colleagues for this extraordinary commitment in such a turbulent year.

“However, anyone who views sustainability solely from a purely micro-economic perspective fails to recognize the seriousness of the situation. We have long been heading into a storm of resource scarcity and man-made climate change.”

Change on the Supervisory Board: Prof. Dr. Hans Sommer resigns from office

This year, we would like to extend a very special thank you to him: our co-founder and namesake of the Drees & Sommer Group, Prof. Dr. Hans Sommer. As of December 31, 2022, he has resigned his mandate as Chairman of the Supervisory Board and stepped down from the Supervisory Board.

For more than 50 years, he shaped the company with intellectual openness, curiosity and hands-on mentality in various functions: As founder, managing director, board member and most recently as chairman of the supervisory board, he is held in high esteem by employees as an entrepreneur without airs or graces. His record is remarkable: since he joined the company in 1971, it has grown from three employees in Stuttgart to more than 5,100 employees at over 60 international locations today. His successor as Chairman of the Supervisory Board since January 1, 2023 has been his long-time deputy on the Supervisory Board, Dr. Johannes Fritz. In addition, his son, Dr. Axel Sommer, joined the Supervisory Board as a new member.

Due to his entrepreneurial achievements, Hans Sommer was appointed Honorary Chairman of the Supervisory Board. His critical spirit and innovative strength will therefore remain with us in an advisory capacity.

Together, we continue to work every day to create a world fit for children. where sustainability has a home.


Steffen Szeidl


Dierk Mutschler


Marc Schömbbs

DREES & SOMMER-PARTNERS

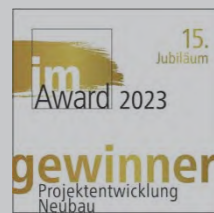
PROF. DR. MICHAEL BAUER, MIRCO BEUTELSPACHER,
FRANK BORNMANN, JÜRGEN BRANDSTETTER,
CLAUS BÜRKLE, KLAUS DEDERICHS, SIMON DIETZFELBINGER,
MANUEL DORN, JÖRG EWALD-LINCKE, CHRISTOPH GAWLIK,
PROF. DR. THOMAS HARLFINGER, THOMAS HÄUSSER,
SASCHA HEMPEL, STEFAN HESELSCHWERDT, KLAUS HIRT,
THOMAS HOFBAUER, THOMAS JAISSE, BJÖRN JESSE, DIRK KAHL,
SASCHA KILB, DR. MARKUS KOCH, FLORIAN LANGLOTZ,
BORIS MATISIC, DR. PETER MÖSLE, DIERK MUTSCHLER,
RAINER PREISSHOFEN, FRANK REUTHER, RALPH SCHEER,
ANDREAS SCHELE, MARC SCHÖMBS, DANIEL SEIBERT,
PROF. DR. HANS SOMMER, PHILIPP SPÄTH, STEFFEN SZEIDL,
PATRICK THEIS, VEIT THURM, HEIKE TITZE, GABRIELE WALKER-
RUDOLF, MARKUS WEIGOLD, JÖRG WOHLFARTH,
KENNETH WOOD, RINO WOYCZYK

With the OWP12 innovation building at the Stuttgart site, Drees & Sommer has realized a demonstration project for future topics in the construction and real estate sector. This is demonstrated by the numerous awards we have received for the building:



FIABCI PRIX D'EXCELLENCE GERMANY

For OWP12, we received the special "Innovation" award at the "Oscars of the real estate industry". The criteria for the award: a successfully implemented overall concept consisting of architecture, use, economic efficiency, urban integration, sustainability and innovation.



IMMOBILIENMANAGER-AWARD

Every year, the immobilienmanager-Award honors the best in the industry. The result: OWP12 was able to prevail against strong competition and was honored with the award in the category "Project development new building".



GERMAN DESIGN AWARD

With its international appeal, this award is one of the most prestigious in the design landscape. We are proud of this award in the category "Excellent Architecture – Interior Architecture" for the "Innovative working environments in OWP12".



IF DESIGN AWARD

As one of the most important design prizes in the world, it is awarded by the oldest independent design institution. We are delighted that we were able to secure the prestigious award for OWP12 as well.



Excellent transformation

The ESG Transformation Award, which was launched this year for the first time by Christian Klein, Professor of Sustainable Finance at the University of Kassel, and the management and IT consultancy Consileon, aims to highlight special ESG initiatives and encourage others to follow. At Drees & Sommer, the sustainable transformation of the organization was convincing – for which we were awarded 1st place in the "Transformation of the Organization" category as part of the ESG Awards. This is clear proof that we are on the right track with our international Beneficial Company strategy.

“In the real estate sector, Drees & Sommer has long made a name for itself as a sustainability pioneer and shows how successful transformation can be achieved. The numerous sustainability and climate protection activities within the framework of a Beneficial Company strategy and the meaningful reporting convinced the jury.”

(Excerpt from the laudation at the ESG Transformation Award)

Strongest brand of the decade

For the tenth time in succession, the REAL ESTATE BRAND AWARD in the "Project Manager" category has confirmed that an honest brand strategy, consistent and continuous focus on relevant target groups, and motivated employees as brand ambassadors make a brand strong – this made Drees & Sommer the special winner of the "Strongest Brand of the Decade" award. The REAL ESTATE BRAND AWARD is one of the most prestigious awards that companies in the European real estate industry can win. The winners are determined on the basis of the largest brand value study of the real estate industry in Europe. In contrast to awards presented by a jury, the only thing that counts here is a company's positioning in the market. Together we work to ensure that our brand remains strong: Consistency, continuity and resilience are its fixed anchor points. Agility and innovative strength combined with – at the same time – remaining consistent is the key to brand building.



WITH A LOT OF DEDICATION AND FUN IN BUILDING

For the first 20 years, Drees & Sommer grew in Stuttgart at up to eight different locations in the city center. DRESO-City in Stuttgart-Vaihingen was established in 1992. Hans Sommer worked here for over 30 years – 16 of them as Chairman of the Executive Board of Drees & Sommer AG and subsequently for another 14 years as Chairman of the Supervisory Board. The center of DRESO-City is the „Obere Waldplätze“, where we arranged to meet him for a tour.

The company founder arrives at the appointment in a very good mood. We begin our tour in the first building planned and constructed by Drees & Sommer in 1992.

OBERE WALDPLÄTZE 13: Mr. Sommer, what prompted the decision to build Drees & Sommer's first office building here?

Hans Sommer (HS): After the company was spread over many locations in Stuttgart, we were urgently looking for a larger building for ALL to rent – that would meet my ideas of a modern working environment. Unfortunately – or fortunately – without success. Instead, a building plot of the state capital Stuttgart suddenly opened up at the Obere Waldplätze. I had the requirements in mind, so I was able to quickly present an initial concept to the city planning office – on a beer mat, so to speak. Our approach at the time was: functional, as little building technology as possible, inexpensive and fast. And after a brief explanation, the head of the city planning office said: That's a good idea. Go for it!

Could you explain, what these requirements meant to you at the time?

HS: The functional ideas were in line with the combi-office developed in the Nordic countries at the time, a mixture of transparent cells and an open space. Bright, communicative and effective. And with a large atrium, like inside the „Globe Theatre“ in London. The air conditioning was designed without much effort: In the atrium, where we are standing right now, a natural principle is at work that buildings in hot areas often take advantage of: In summer, the glass skylights above us open at night, allowing air to flow outside from the offices. During the night, the heat-storing ceilings and the building as a whole cooled down, and on the following day the offices had a very pleasant temperature. Due to a new office concept, this mode of operation is now somewhat limited.

So the quality of stay in OWP13 was already at the center of planning?

HS: Yes, absolutely. OWP13 has always been more than just an office building. Until 2019, cultural events with the „Junge Oper“ (Young Opera) were held there regularly, also because the acoustics are advantageous for vocal performances in the atrium.

You built the building privately. Why?

HS: First of all, it was and is my opinion that the company's working capital should not be tied up for its own buildings. In addition, I had learned in the past 20 years that those projects

ran best that someone paid for privately out of his own pocket. The partners of the Drees & Sommer AG at that time (Drees, Sommer, Mochmann, Oesterle, Scheidler) therefore founded a GBR of their wives for the project, which functioned as a closed real estate fund.

You once reported that limited financial resources and high interest rates on loans forced you to be inventive. But you can't tell by looking at the building.

HS: Look under your feet! The floor in the atrium consists of stone slabs of different sizes. At the time, we used offcuts from large facade slabs from a bank. We had many things made by craftsmen according to my sketches – such as the entire partition walls of the office and meeting rooms – but also the wooden windows, which we have now replaced after 30 years for energy reasons. An important requirement was that the constructions had to be as simple as possible, but still reliably fulfil their purpose. And it was also remarkable that occupancy could take place just 21 months after the purchase of the land, which saved considerable interest during the construction period.

What was the importance of the courtyard in the overall concept?

HS: The landscaped courtyard was planned as an extension of the atrium, incidentally an idea of my wife. It has developed into a green oasis that employees enjoy when the weather is nice and that is also very frequented during summer parties.



Obere Waldplätze 13 (OWP13)



OBERE WALDPLÄTZE 11: In the past, beyond the OWP13 courtyard was the meadow of a plot of land that was still undeveloped. How did the OWP11 come into being?

HS: Together with our former partner, Roland Huber, I fought for seven years with the owners for this property, as it became increasingly apparent that OWP13 was getting overcrowded.

Our approach with OWP11 was to adopt the working environment of OWP13 – but with marketable materials and products. Above all, however, we wanted to set an example with the building in terms of energy. In order to have the lowest possible heat requirement, we first developed a special, highly insulated, but space-saving facade – and later used it in projects for our customers as well. In addition, we relied on component heating, heat pumps and geothermal energy as early as the planning stage in 1998. Heating in winter and cooling in summer. With this pioneering concept, OWP11 has won many gold and platinum awards – as a new building and as an existing building. Combined with the green electricity we purchase, OWP11 is energy neutral. At OWP11, Eberhard Oesterle and I have taken on the venture of a private developer for an experimental building.

We enter the friendly opening entrance of OWP11. On the wall to the left, we can't miss „Changing Colors,“ a work of art by artist Christa Winter. Depending on the viewer's point of view, its colors change. Is this a metaphor for the changing perspectives in business?

HS: Yes, that was the approach at the time: to recognize that different ways of looking at office buildings lead to different solutions. Thus, the partition walls of the combi offices in OWP11 were later dismantled (but they had to be stored). Currently, according to Corona: the partition walls are being reinstalled. The idea of having an acoustically closed office at the same time, but one that is transparent to the interior multizone, has proven itself to this day.



Obere Waldplätze 11 (OWP11)

OBERE WALDPLÄTZE 22: Our walk takes us over to OWP22, a simple industrial building that Drees & Sommer has brought out of its slumber in 2019. What was the occasion?

HS: The campus increasingly lacked meeting rooms and there was also no area where people could exchange ideas with start-ups, for example. This gave rise to the idea of acquiring the former bookbindery, which we converted into a building for office work, meetings and events while retaining its industrial character. The Innovation Center is located on the first floor and in the basement, while the top floor temporarily housed the boardroom. The idea was for employees from different locations to come together here temporarily to work on innovative projects. The special character is well received by

visitors and employees. Younger people in particular like the rooms here.

What immediately stands out inside is the old red floor, which dates back to the time when the building was used as a factory. And, of course, the open ceilings that offer a view of pipes, shafts, supporting structure and concrete. In between, workstations with screens, yellow socket collectors hanging here and there from the ceiling.



Obere Waldplätze 22 (OWP22): Innovation Center

You get the feeling of being in a stylish industrial loft in Manhattan. Was that the plan?

HS: That's how it turned out during the planning process, when we were thinking about the use. Incidentally, the concept shows that by looking at things from different angles, totally new and exciting plans can emerge. And many things simply result from what is already there.

OBERE WALDPLÄTZE 12: We end our tour in the newest building on the Drees & Sommer campus: Obere Waldplätze 12. What connection do you have with this building?

HS: Before the new building, everything looked quite different here. A cycling clubhouse that was clearly getting on in years was located on what was a rather narrow plot of land. Together with the cyclists – and again with Roland Huber – I looked for a new area for the club and also found it nearby on a municipal property. There, with our cooperation, a new, modern clubhouse was built.



Dear Mr. Sommer, we thank you for the interesting insights into the development of Dresco-City and wish you further interesting times.

Obere Waldplätze 12 (OWP12): Innovation building with company restaurant

Was the concept clear from the start?

HS: Not at all! I had initially planned a 2-storey office extension with a company restaurant together with another architect. This was also approved by the city planning department. During the vote in the Vaihingen City Council, the Green Party surprised us by demanding that we build four stories instead of two. Although the plot was actually too narrow, this „compromise“ was finally implemented under the leadership of Steffen Szeidl and Thomas Berner.

And how do you feel about the current building?

HS: This office building would actually have to be described as a „plus energy working environment“. During the preliminary considerations, the focus was clearly on the fact that Drees & Sommer wanted to go well beyond what is technically possible today. Thanks to digitization, BIM and lean construction management, this worked out great. OWP12 has won a number of awards for its innovations and its beneficial orientation. And it is attracting a lot of attention from experts.

Is it difficult for you to say goodbye to your work as a member of the Supervisory Board?

HS: To be honest, not at all. The transition was very well prepared and the succession perfectly arranged. Personally, I enjoy developing and advancing topics relevant to the construction and real estate industry more. For example, the revitalization of existing buildings, modularization outside of system construction, the reinvention of high-rise buildings and much more. I won't get bored.

FROM PARASITISM TO SYMBIOSIS — WE CAN DO IT!

The parasitic behavior began more than 5,000 years ago in the Neolithic period or perhaps earlier, with slash-and-burn agriculture to create new arable land. It intensified with the beginning of industrialization, when people started to help themselves to all kinds of natural resources on an increasing scale. To satisfy the energy requirements of ever-larger machines and motorized transport using combustion, we also took fossil fuel energy from the Earth's interior, beginning with coal and followed by oil and natural gas, using all imaginable methods. We are now also using the perfidious method of fracking.

The Earth has for a long time been reacting by developing a fever, in the form of global warming, as a result of the increase in carbon dioxide (CO₂) in the atmosphere. It is now beginning to struggle. The impacts are being seen in the form of heatwaves, severe storms, flooding, water shortages etc. This has not happened overnight. Nor is it irreversible. If we all wanted to, it would be possible for us to change our parasitic relationship with the Earth into a symbiotic one, until we are living more in tune with nature again.

Some scientists accuse human beings of parasitic behavior because we take everything from our host, the Earth, that we think we need for our existence without a thought. Geologically speaking, the time span for which humans can live on our planet is very short.

For coming generations of our species we have to do our utmost to maintain the Earth's livable condition for as long as possible.



What Can Be Done?

For a start, we must not extract any more carbon from the geosphere – that is, the solid portions of the Earth. Instead we have to take it from the atmosphere, the biosphere and first of all the technosphere. We have to transform this technosphere into a technical cycle from which we recover carbon again and again. The other thing we must do is to remove more carbon dioxide from the atmosphere than we emit.

The energy pathway (page 25) is the decarbonization of energy production using solar energy, geothermal energy, wind, biomass and hydrogen instead of energy from fossil fuels. The aim is gradually to reduce human-induced carbon emissions to zero, in order to prevent the concentration in the atmosphere from increasing above the current alarming record value of

more than 420 ppm (parts per million). The way to achieve this is clear, in principle – but we must actually do it, without any further delay.

The materials pathway (page 29) is recarbonization by capturing carbon from the atmosphere, the biosphere and the technosphere instead of from the geosphere as we have done up to now. Decarbonization and recarbonization can allow us to return to a predominantly natural carbon cycle (as shown in figure 2). The carbon cycle of the oceans and the landmass is largely balanced. If it were possible to turn human activities around so that they help to create a carbon sink, in theory the balance could be reestablished.

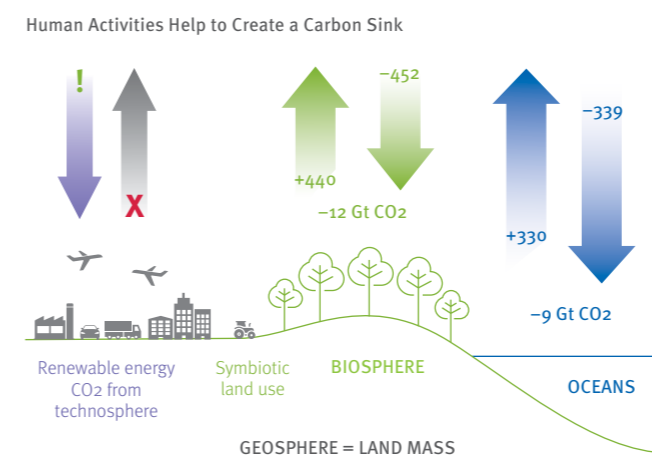


Fig. 2: Reversal of human-induced carbon emissions to create a carbon sink by 2050

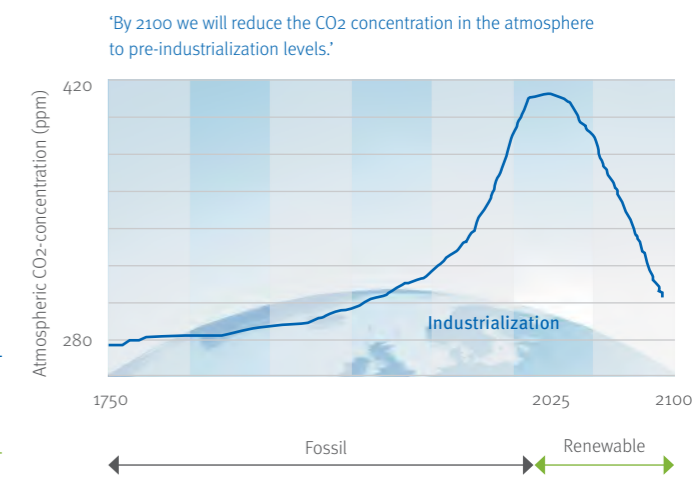


Fig. 3: Vision 2100 – an atmosphere as it was before industrialization

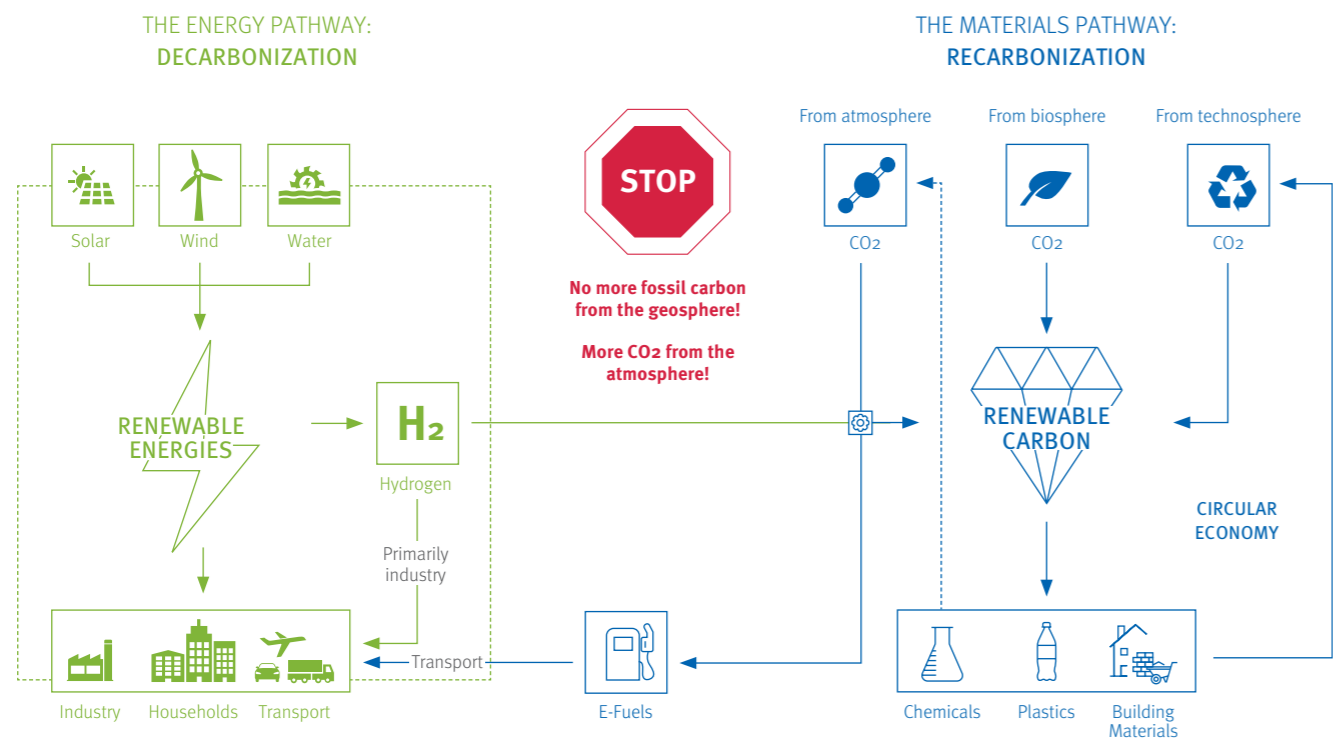


Fig. 1: The two pathways to combating global warming

For instance, storing carbon in the products of the chemical and plastic industry and other products, such as construction materials, could reduce the carbon in the atmosphere again. In other cases, such as in e-fuels, at least no additional carbon is produced.

Other countermeasures to create carbon sinks include protecting woodlands and rainforests and reforestation, in addition to restoring peatlands. Natural, growing peatlands extract CO₂ from the atmosphere and store it in the peat. On average, peatlands store around 700 tons of carbon per hectare – six times more than a hectare of forest can store. Semi-desert greening is also being considered for certain semi-arid areas. This involves seawater desalination using renewable energy. If we switched to a predominantly vegetarian diet and reduced livestock numbers, there would also be a very positive impact.

All these activities are about giving back to our environment in a kind of symbiotic relationship, instead of damaging it further. Human beings are therefore in transition from a fossil fuel-driven to a regenerative industrial age.

If we systematically implement decarbonization, recarbonization and other measures that acknowledge our symbiotic relationship with the planet, we can return the atmosphere to its pre-industrial condition by 2100, and thus hopefully preserve our world for future generations. It is too late to rehabilitate the areas that have already been destroyed – melted glaciers, extinct species etc. However, we could prevent further harm.

The Current Situation in Relation to Climate Change Mitigation in Germany

Germany reached its climate target for 2022 and reduced its greenhouse gas emissions compared with the previous year. However, the results for the individual sectors vary significantly: While industry, agriculture and the waste management sector are all well below their targets, the buildings and transport sectors have clearly exceeded theirs.

Energy Sector

In the energy sector, 2022 initially brought a sharp increase in emissions. The reason for this was an increase in the use of bituminous coal and lignite for energy production. Overall, however, the energy sector just managed to meet its 2022 emissions target of 257 million tons of CO₂ equivalents.

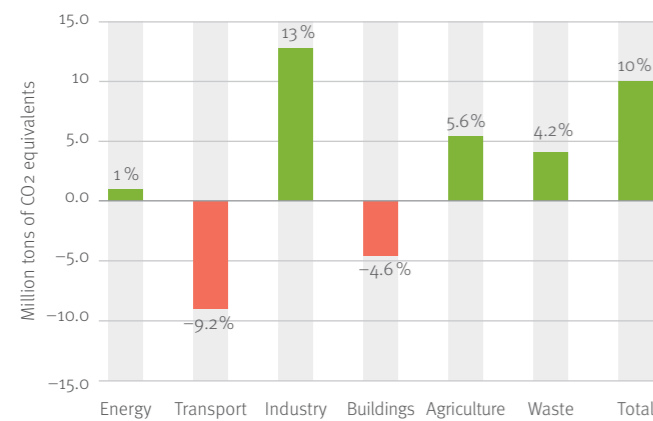


Fig. 4: Difference between the 2022 targets for the sectors and the levels achieved

The share of renewable energies in the electricity sector as a whole continues to grow, but too slowly. Electricity production from renewable sources has grown by nine percent in comparison with 2021, and now covers 46.2 percent of Germany's gross electricity consumption. The share of renewable energies as a proportion of gross final energy consumption – the total consumption of electricity, heat and fuels – has also increased, albeit only to a little higher than 20 percent.

Apart from the need to expand renewable energies hugely (especially wind and solar energy), the greatest challenges are to increase storage capacities, expedite the expansion of the network, and increase sector coupling. Drees & Sommer is actively working with partners on solutions to these problems.

Transport Sector

According to official figures, transport sector emissions exceeded the target for the year, at 148 million tons of CO₂ equivalents – the permitted level was 138.8 million tons.

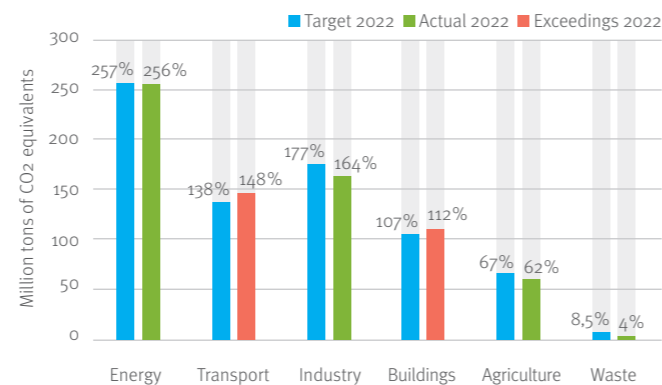


Fig. 5: Comparison of target achievement by sector (target/actual)

After the relatively low volumes of car traffic in 2021 as a consequence of the pandemic, traffic increased again during the past year – along with fuel consumption. Prices at the pump were reduced by a fuel price rebate in Germany. Also, although 2022 was a record year for registrations of new electric vehicles, the growth was not sufficient to compensate for the increase in emissions.

There was a jump of 16 percent in the use of renewable electricity for transport, but sales of biofuels stagnated over the same period. This meant that the share of renewable energies in the total final energy consumption remained the same as in the previous year at 6.8 percent, according to the German Environment Agency.

It has already been decided that electric motors are to be the norm in future car manufacturing. Combustion engines using only e-fuels are an option in principle, if they are available in appropriate quantities and at competitive prices. However, we will initially need these products chiefly in the chemical industry and for the manufacturing of plastics, as well as in aviation, shipping and heavy goods vehicle transport.

Industrial Sector

Emissions in the industrial sector dropped by 19 million tons of CO₂ equivalents – or 10.4 percent – in 2022. The target was around 177 tons, but the emissions only amounted to 164 million tons.

The war in Ukraine and the soaring energy costs connected with it have resulted in sharp falls in energy use. This primarily affected the metalworking and chemicals industries, which used significantly reduced amounts of fossil fuels (with the exception of anthracite). Manufacturing figures are also declining in some areas, especially in the energy-intensive industries. This has already prompted talk of a partial deindustrialization.

The Power-to-X pathway, which entails the production of electricity-based fuels such as hydrogen, methane or methanol in global regions rich in solar and/or wind resources, presents a great economic opportunity for Germany. Domestic companies are currently leading the way in many key technologies for the production of these synthetic fuels. These include electrolysis, the catalysts used for the synthesis processes, and the construction of the complex chemical plants themselves.

In this sector, Drees & Sommer is primarily involved in process improvements, the use of hydrogen, and sector coupling.

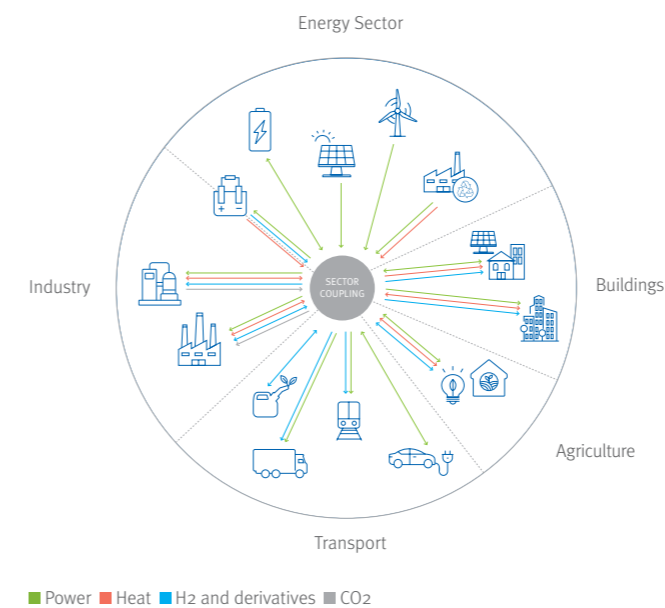


Fig. 6: Sector Coupling for an integrated overall system

Buildings Sector

Although the buildings sector reduced its emissions by 6 million tons of CO₂ equivalents compared with 2021, it still exceeded the target set for 2022, which was 107.4 million tons of CO₂ equivalents, while the quantity emitted was 112 million tons. Also, the reduction in comparison with 2021 was not the result of energy-saving measures, but primarily the higher energy prices and the mild weather, which had the effect of reducing people's use of heating and hot water. The main increases were in sales of light heating oil, which rose by around 9 percent to replenish stocks again after the low level of heating oil purchases in 2021.

The buildings sector faces big challenges. Germany's heating systems are on average 17 years old. In 40 percent of apartments, the radiators are at least 20 years old and should be replaced. The demand for heating system upgrades is strong, and the opportunities are potentially also huge. The replacement of these heating systems would reduce CO₂ emissions significantly. Building construction also generates high levels of CO₂ equivalents, which we must also take into account. The current and future possibilities are covered below in a separate section, along with the approaches taken by Drees & Sommer.

Agriculture and Waste Management Sectors

The agriculture and waste management sectors both remain significantly below the specified annual emission targets. Instead of 67.6 million tons of CO₂ equivalents, the agriculture sector recorded 62 million tons. This was mainly attributable to a further decline in pig farming. The quantity of chemical fertilizers used in agriculture was also lower due to the rise in costs as a consequence of the war in Ukraine.

At 4.3 million tons, the emissions from waste management are also well below the specified level of 8.5 million tons. The main reason for this is the banning of organic waste from landfill.

Cost-Effective Ways to Avoid CO₂ in the Buildings Sector

The construction and buildings sector is one of the biggest climate change culprits, and currently accounts for 38 percent of global CO₂ emissions. This figure includes building operation – the CO₂ emissions from the consumption of energy in the form of natural gas, heating oil or electricity for heating and hot water systems and air conditioning. It also covers the CO₂ emitted during construction, including energy consumed in the manufacturing of construction materials and process-related CO₂, such as from the burning of limestone during cement manufacturing.

At Drees & Sommer, we began to look at how CO₂ emissions could be reduced as early as the 1980s. Initially our aim was to reduce the energy wasted in running buildings, and since 2000 we have not used any fossil fuels in buildings occupied by ourselves. However, to make a real impact, we have to consider the complete life cycle; in other words, we need to take into account factors such as the manufacturing of construction materials, while also making everything cost-effective. According to Drees & Sommer's 'blue way', ultimately only a symbiotic relationship between ecology and economy leads to success.

- > **Glazing:** often only single-glazing or in need of upgrading
- > **Façade profile:** often without thermal separation
- > **Thermal insulation:** often lacking or of insufficient thickness
- > **Solar protection:** not centrally controlled by electromechanical system
- > **Sealing layers, sealing profiles** torn or disintegrated
- > **Condensation:** accompanied by strong cold air drop
- > **Contaminant loads:** often within the façade
- > **Ventilation and air conditioning:** ineffective, not up to modern standards of comfort
- > **Electrical installations:** mostly out-dated and difficult to upgrade

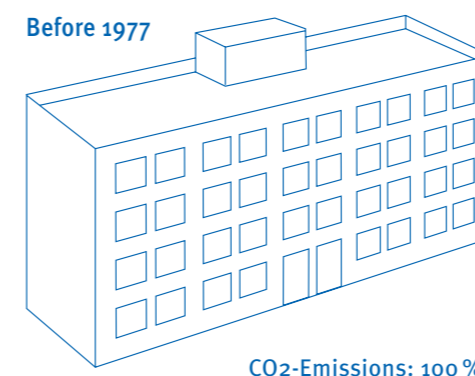
The recent decisions by the German federal government are a response to the fact that Germany has a great deal of catching up to do, as far as reducing CO₂ emissions in the buildings sector is concerned. In energy renovation, a key role is played by the interaction between the shell of a building, the technical building services and the building physics. These three elements have a particularly strong impact on the indoor climate and the energy used for heating and cooling.

Although there are certainly solutions for sustainable heat production, as described in a later section, these generally involve a fairly expensive structural upgrade of the building. Of course, it mainly depends on the condition of the building. Buildings of an older type of construction often have typical defects that are not necessarily considered initially.

Heating generators designed for low-temperature heating systems usually require modifications on many fronts: improvements to the building's roof and façade insulation are usually unavoidable, along with transformation of the heat output in the building. The latter generally entails replacing all the radiators. This alone is expensive enough – and if any of the defects described above are discovered, a gut renovation is likely to be needed.

The investment costs for optimizing existing buildings with the aim of sustainable, carbon-free heat production must be affordable for the owners. Grants alone will certainly not cover the entire cost. Before every upgrade, owners should obtain comprehensive advice on a long-term approach – regarding not only structural issues, but also possible changes of use and the most appropriate project workflow. Depending on the scope of the work, property owners may not be able to avoid having to vacate the building, unless an intelligently designed workflow can get around the issue. For this to work, the individual tasks and consequences with regard to the future use, cost-effectiveness and feasibility have to be examined carefully.

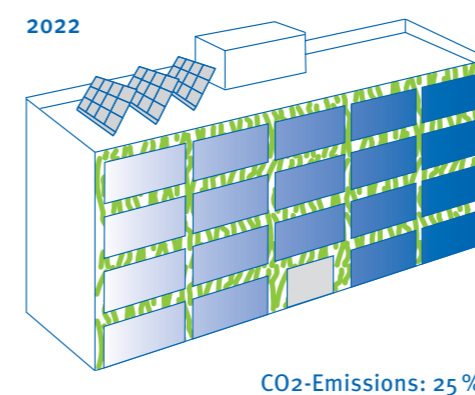
The diagrams below show the differences between the tasks for buildings erected before 1977, when the first German Thermal Insulation Ordinance (1. Wärmeschutzverordnung) was passed, and for buildings that it is possible to build today (2022) and in the future (2035).



NEW OFFICE BUILDING BEFORE 1977
(THERMAL INSULATION ORDINANCE)
(5,000 GFA, 15,000 GV,
expected useful life 50 years)

Construction

- > Solid
- > Weak/uninsulated
- > Simple façade
- > Low technological standard
- > Construction materials non carbon-efficient



NEW OFFICE BUILDING 2022
(5,000 GFA, 15,000 GV,
expected useful life 50 years)

Construction

- > Solid
- > High standard of insulation
- > Highly insulated façade
- > High technological standard
- > Construction materials more carbon-efficient

Cradle to Cradle® – properties

- > Origin: primary material from the geosphere: 98 %
- > Usable in future:
High-quality RC technosphere/biosphere: 20 %

Energy supply/building services

- > Oil-fired heating
- > Mains electricity
- > non-energy efficient

Environmental performance (CO₂ per year)

- | | |
|-----------------------------------|--------------------------|
| > Building construction | 55 t CO ₂ /a |
| > Building energy requirement | 352 t CO ₂ /a |
| > Users' electricity consumption | 124 t CO ₂ /a |
| > Energy produced by the building | 0 t CO ₂ /a |

Total CO₂-Emissions 532 t CO₂/a

Cradle to Cradle® – properties

- > Origin: primary material from the geosphere: 95 %
- > Usable in future:
High-quality RC technosphere/biosphere: 30 %

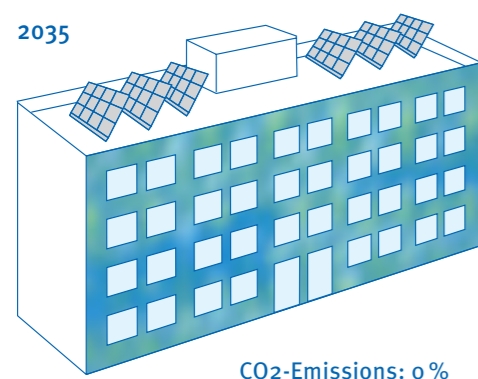
Energy supply/building services

- > Geothermal, heat pump (or similar)
- > Photovoltaics 150 m²
- > Mains electricity
- > High energy-efficiency

Environmental performance (CO₂ per year)

- | | |
|-----------------------------------|--------------------------|
| > Building construction | 41 t CO ₂ /a |
| > Building energy requirement | 124 t CO ₂ /a |
| > Users' electricity consumption | 59 t CO ₂ /a |
| > Energy produced by the building | -88 t CO ₂ /a |

Total CO₂-Emissions 135 t CO₂/a



NEW OFFICE BUILDING 2035

(5,000 GFA, 15,000 GV,
expected useful life 50 years)

Construction

- > Modular construction components
- > High standard of insulation
- > Translucent façade, adaptive
- > Very high technological standard
- > Some construction materials a CO₂ sink

Cradle to Cradle® – properties

- > Origin: primary material from the geosphere: 50 %
- > Usable in future:
High-quality RC technosphere/biosphere: 75 %

Energy supply/building services

- > Geothermal, heat pump (or similar)
- > Photovoltaics 250m²
- > Mains electricity
- > High energy-efficiency

Environmental performance (CO₂ per year)

- > Building construction 14 t CO₂/a
- > Building energy requirement 69 t CO₂/a
- > Users' electricity consumption 37 t CO₂/a
- > Energy produced by the building -120 t CO₂/a

Total CO₂-Emissions 0 t CO₂/a

In buildings erected **before 1977** the idea of Cradle to Cradle® (C2C, see page 32) or the true circular economy was unknown. Ninety-eight percent of the primary materials for construction originated from the geosphere. Around 20 percent are reusable after demolition. The CO₂ emissions amount to 523 tons per annum (defined as 100 percent), of which building energy and users' electricity consumption account for 477 t/a. Bringing these emissions down as close to zero as possible and making this effort cost-effective is clearly a huge task. It requires an optimum of analysis, planning and implementation.

For a new build today, it is possible to design and implement both the building and the technology. However, the true circular economy in the form of Cradle to Cradle® is still in its infancy, meaning that the construction materials and building elements to support C2C are not readily available yet. As a result, 95 percent of the primary material still originates from the geosphere. Around 30 percent of the materials can be reused after demolition.

Thanks to the optimized interaction between building's shell, the building services and the building physics, the energy supply situation is significantly better. The building in the example has a heat pump with geothermal energy, and uses photovoltaics. Additional digital data and processes contribute to the reduction of the building energy and users' electricity, with the result that the energy production for the building services only causes

CO₂ emissions of 94 t/a, around a quarter of the quantity produced by the pre-1977 new build.

In twelve years, the influence of C2C will have grown. New technologies such as intelligent façades will also have a positive impact. These digitally-controlled façades will change their physical behavior in response to the weather conditions, and will probably also have integrated solar cells to produce additional electricity.

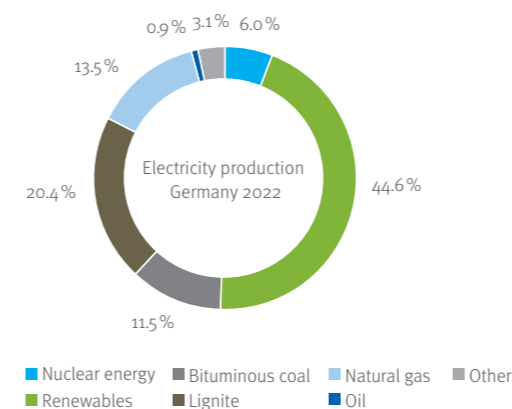
In 2035, only around half of the primary material for the building will originate from the geosphere. Approximately 75 percent of all the materials used will be reusable or recyclable without any loss of value after the building is demolished. The CO₂ emissions from the actual construction will only amount to a third of the quantity produced in 1977. The total CO₂ emissions will be zero. Further measures, such as photovoltaics other than for the building's own use, will make the building a carbon sink.

The diagrams show that if we want to reduce CO₂ emissions over the entire life cycle of the building we have to consider two aspects, which we will go into in greater detail below. They are the energy consumption during use (energy pathway = decarbonization) and the construction method, including the materials used (materials pathway = recarbonization), which in future must be based on true circular economy principles in respect of the resources used in the construction materials.

The Energy Pathway – Decarbonization Through Energy-Efficient Building Operation

The only way to reduce CO₂ emissions from building operation is by a gradual switch from fossil fuel energy sources to renewable energy sources.

Electricity production in Germany 2022



Breakdown of renewable energies 2022

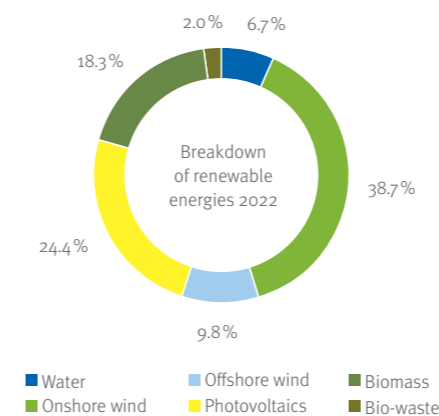


Fig. 7: Electricity production in Germany in 2022 and the share of renewable energies

However, at present only around 45 percent of electricity is produced from renewable sources. Given the current electricity mix, for every use of electricity – regardless of the statutory definitions – on average more than 50 percent of that electricity is causing CO₂ emissions from fossil fuel energy. This applies equally to electric vehicles, heat pumps and general electricity usage in buildings.

Primary energy consumption, Germany 2022

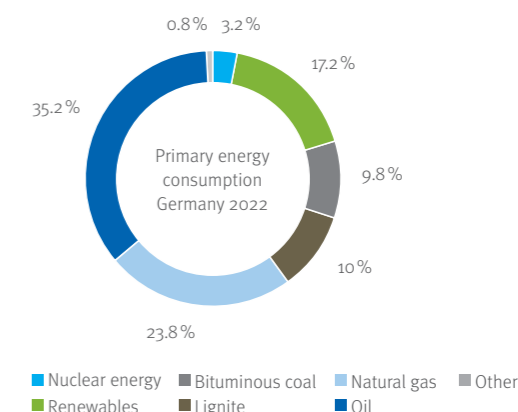


Fig. 8: Share of renewable energies in primary energy consumption in Germany in 2022

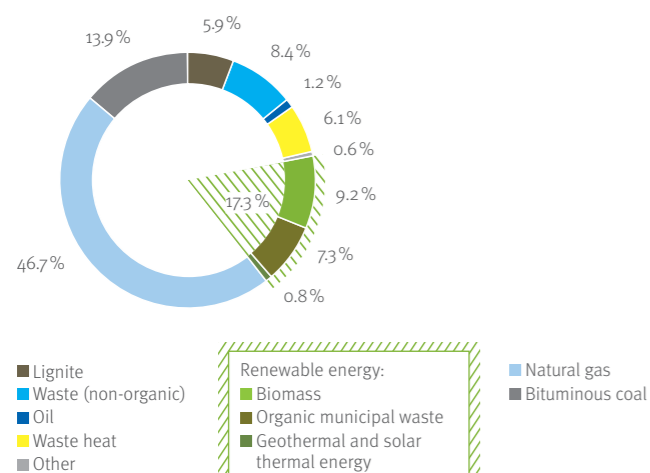
However, renewable energy should in future cover not only existing electricity demand, but also a large portion of the overall primary energy demand. Up to now, only a share of up to 17.2 percent has been covered. In other words, renewable energies will have to be expanded sixfold unless we save substantial amounts of energy instead.

A very large share of fossil fuel energy is used for heat – especially for heating homes. The emissions are highest from the use of heating oil, followed by liquefied gas and natural gas. To deal with this, the German federal government wants to switch to other energy sources for heat production as quickly as possible, for both new buildings and older buildings.

In well-insulated new buildings this is okay, and it is generally being done anyway. However, in older buildings it is much more important to accelerate the reduction of the buildings' energy requirements as a first step (e.g. over five years) by issuing specifications and setting up a well-funded attractive grant scheme. Provisions for low-temperature heating systems could also be included. The second step should be to switch existing residential buildings to energy sources with low CO₂ emissions, and this should be coordinated with the development of a green electricity supply. It would be disastrous if the population were forced to buy heat pumps which then had to be operated mainly with fossil fuel-based electricity (especially from coal).

Expansion of District Heating for Entire Quarters

As a nationwide solution there are plans for a huge expansion of district heating, which is certainly an efficient approach. District heating networks can be very flexible and use a number of different heat sources, both central and decentralized. The difficulty is that at present district heating is by no means as sustainable as many people think. District heat is usually produced in large power plants with cogeneration, smaller combined heat and power (CHP) plants, waste incineration plants, or district heating plants – with coal, natural gas, biogas, oil, wood and wood products, solar thermal energy, and refuse (biogenic and non-biogenic) in various combinations and processing forms as a fuel.



* The heat provider and injections from industry and other
** Provisional

Fig. 9: Average energy mix for district heating in Germany in 2022

The lion's share of the energy for district heating currently comes from fossil fuels, particularly natural gas and coal. Only around 18 percent comes from renewable sources, especially biomass and biogenic refuse, and less than 1 percent is geothermal or solar energy. There is definitely still significant potential for expansion, at least in the case of geothermal energy. A further pathway to improving sustainability is based on sector coupling, through the integration of industrial waste heat into district heating networks.

The transportation of district heating becomes significantly less efficient from a certain pipe length, which is why the consumers usually live within a radius of 10 kilometers (the maximum is 20 kilometers) from the power station. Where the distances are shorter, the system is referred to as a local heating network.

Connection to a district heating network has some advantages: it saves space, no fuel purchases are necessary, there are no maintenance costs and it is easy to operate. Also, no building renovation is required, although of course it is helpful. The disadvantages, depending on the region, are the usually relatively high costs and being tied to a specific provider. Connection is often compulsory.

Overall, however, district heating is a sensible way to reduce the CO₂ emissions of entire city quarters, especially with the potential for sector coupling. Also, the efficiency of the plants is improving continuously. Only more sparsely populated regions are not being offered district heating for the foreseeable future. The only options in these areas are individual systems or small local heating networks (e. g. bioenergy villages).

Heating With Heat Pumps

There has been a lot of hype recently around the use of electric heat pumps. However, with the current measurement basis (–10 bis –15 °C) they are only cost-effective for operation as a low-temperature heating system. This is generally feasible in new buildings, but it is difficult with buildings dating from before the introduction of the German development bank energy efficiency standard KfW55 EE, and buildings heated by normal radiators. These cases call for renovation followed by energy improvements – including replacement of the heaters and hydraulic balancing.

However, our climate has already changed measurably. In recent winters the temperature has only fallen below 0 °C for a few hours. If this continues – and that looks likely – in many cases expensive insulation might not be necessary, and perhaps only some of the old radiators would need to be replaced by new and more efficient ones.

As a further alternative, higher temperatures can also be achieved by using high temperature heat pumps – although these use significantly more electricity. Hybrid solutions are another option, in which a gas-fired boiler starts up, for instance, on the few hours during the year when the temperature falls to –5 °C or lower. Of course, this is more cost-effective, especially if the gas boiler is already in place.

A general process for a heat pump-ready renovation at current temperature specifications could take the following shape:

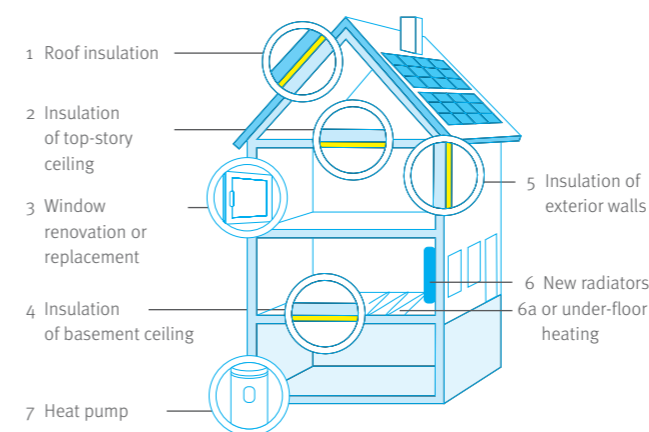


Fig. 10: The sequence of the steps in an energy renovation process

If the building is equipped for a low-temperature heating system (heat pump-ready), there are various options.

Air-to-Water Heat Pump

How the heat pump produces energy from air can be explained in a simplified way using the example of a refrigerator. While a refrigerator transfers warm air from the inside to the outside, the air-to-water heat pump brings the warmth from the surrounding air into a room. A fan actively draws in the surrounding air and transfers it to an air-to-air heat exchanger (evaporator) built into the heat pump. A refrigerant circulating inside the pump changes its physical condition and evaporates even at low temperatures. A compressor compresses this refrigerant vapor to raise it to a level at which it can be used for heating and hot water.

A heat pump operated with the current electricity mix only performs around 30 percent better overall than natural gas heating in terms of CO₂ emissions.

Air-to-Water Heat Pump With Photovoltaic (PV) System

Heat pumps with a PV system and battery storage are an effective and sustainable combination. With the electricity produced by the photovoltaic system, the heat pump can provide heating energy directly. This reduces operating costs significantly and the

entire system works in a more environmentally-friendly way. The German federal government provides grants for the purchase of heat pumps and photovoltaic systems, individually and as a hybrid system.

Heat Pump With Geothermal Energy

There is a lot of heat stored beneath the surface of the earth, which makes it one of the most important sources of heat. Below a certain depth, the ground temperature is around 10 °C. The temperature is very constant in comparison with that of the ambient air. Even if the upper layer of earth is frozen, geothermal heat pumps work efficiently because the difference between the heat source and the flow temperature stays relatively small, even in winter.

The mechanics are basically the same as in air-to-water heat pumps, except that there is more basic heat available, especially in winter. However, the geothermal probes make the equipment significantly more expensive, which is why they are more suitable for large buildings (almost all high-rise buildings). A further advantage is that they provide very inexpensive cooling in summer, purely through circulation and without the use of the heat pump. Unfortunately, the geothermal probes are not allowed everywhere.

Heat Pump With Geothermal Energy and PV System

The most effective and also the most sustainable way of producing heat is to combine a heat pump with geothermal energy and a PV system. The heat pump is for the most part able to operate on the solar energy produced by the PV system. In this way, the building can even generate surplus energy.

The energy potential of the environment at a glance

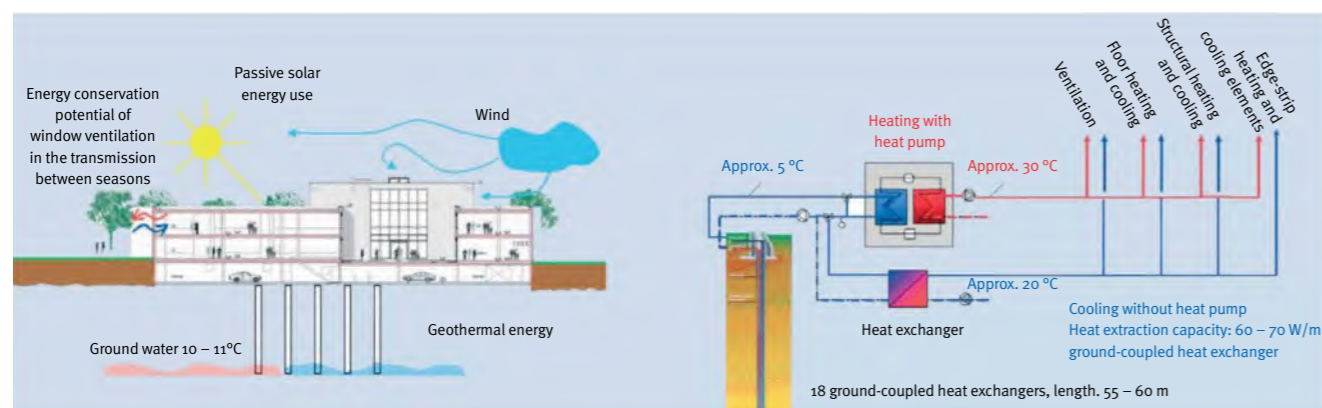


Fig. 11: Geothermal generation of heating and cooling.
Heating yield: Approx. 4.5 kWh heat for 1 kWh electricity

Heating With Wood Is Not Sustainable

Contrary to popular opinion, heating with wood is not carbon-neutral. The notion that a tree burnt in a stove in winter will grow back in 50 years (perhaps) is a naïve fallacy, and to offer grants for wood burning is absurd. The CO₂ emissions are even higher than for fossil fuel energies such as coal or gas. Wood burning also produces carbon monoxide, nitrogen oxide, methane, soot and other harmful emissions.

Basically, wood-fired heating systems of any kind should be banned, at least within residential areas or cities. The only exceptions allowed should be for rural areas or isolated farms with managed forests. Existing plants should be upgraded with an optimum combustion control system such as that developed by Karlsruhe Institute of Technology (KIT).

“Wood is the most highly polluting and environmentally harmful fuel to burn.”

Achim Dittler, Karlsruhe Institute of Technology (KIT)

The only wood products that are really environmentally friendly are durable ones such as items of furniture, which also store the tree's carbon and so act as carbon sinks. The only wood that should be processed into wood pellets is sawdust or waste timber or wood that has previously been used, provided that the latter has no further use as a material. Unfortunately, forests are now being cut down for the production of pellets, as for instance in Romania.

Heating With Hydrogen

The extent to which green hydrogen could be used for heating is debatable. At present this is more of a theoretical discussion, owing to its high costs and low availability. Nevertheless, green hydrogen could be injected into the existing gas network, for instance at a concentration of 10 percent (and more in the future).

Fuel cells can provide electricity and heat to buildings at the same time. In combination with thermal energy or electricity storage devices, they could become a component for sector coupling. However, the investment and maintenance costs are relatively high, so the system is more suitable for big consumers – and only when inexpensive green hydrogen becomes available.

Gas water heaters are the most widely used water heaters in existing buildings. The investment costs are comparatively low, and the operation and maintenance procedures are established. The cost of converting them into hydrogen water heaters would be low.

However, these possible solutions are currently not high on the agendas of either energy suppliers or policymakers. There is a simple reason for this: for the near future, there will not be sufficient hydrogen in Germany to use it in buildings for heating purposes. For cost-effective production of green hydrogen on an industrial scale, access to large quantities of cheap, renewable energy is indispensable. Large-scale projects to produce green hydrogen will therefore be focused on areas where there is access to cheap, renewable energy from wind and/or sun.

The Materials Pathway – Recarbonization Through Construction Materials and Processes

In the 1960s and 1970s hardly anyone was interested in whether CO₂ was emitted during the construction phase, whether building materials were healthy, or what happened to the building after the end of its useful life.

In the 1980s and 1990s, Drees & Sommer began to design buildings in a way that minimized the use of energy, and using rainwater – for both commercial and ecological reasons. We were also concerned with avoiding the use of harmful building materials (see Site Manager Manual used for the Berlin Potsdamer Platz construction project in this period). Ultimately what we were interested in was minimizing any harm and avoiding negative impacts (especially in the area of energy), but we still have a long way to go.

For this reason we now also have to devote increased attention to the second pathway – maximizing positive impacts through product optimization, carbon sink building products and the circular economy in the form of Cradle to Cradle®. We also need to develop a new understanding of materials incorporated into buildings as a repository for raw materials.

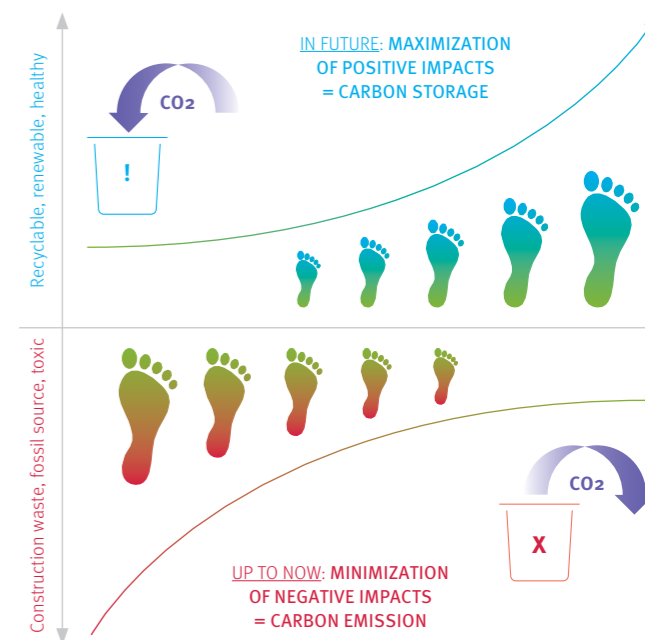


Fig. 12: From minimizing negative impacts to maximizing positive impacts

Optimized and New Construction Materials in Development

For the construction of buildings, gray energy is needed to obtain raw materials and construction materials (cement, steel, aluminum and others) and manufacture building components.

Energy Use for Construction Components

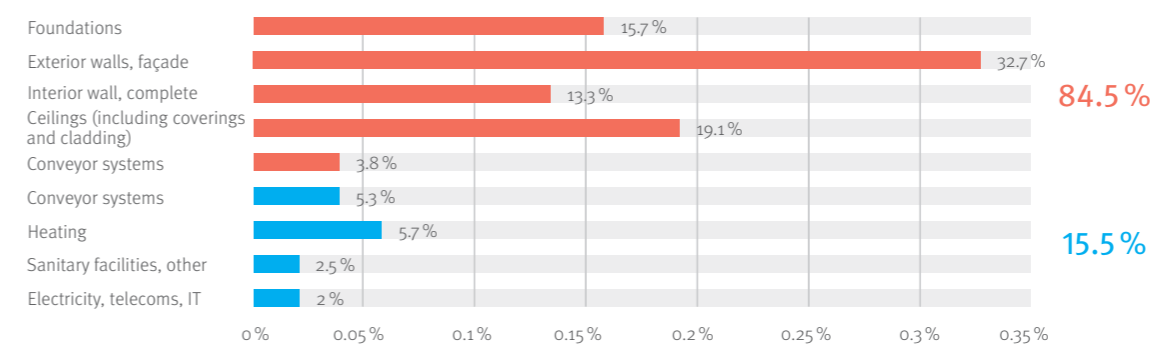


Fig. 13: Comparison of average energy consumption for different building components

The biggest use of energy is for building the shell, the façade and the roof. These cause a large quantity of CO₂ emissions.

53 apartments

Volume: 14,800 m³

Living space: 3,600 m²

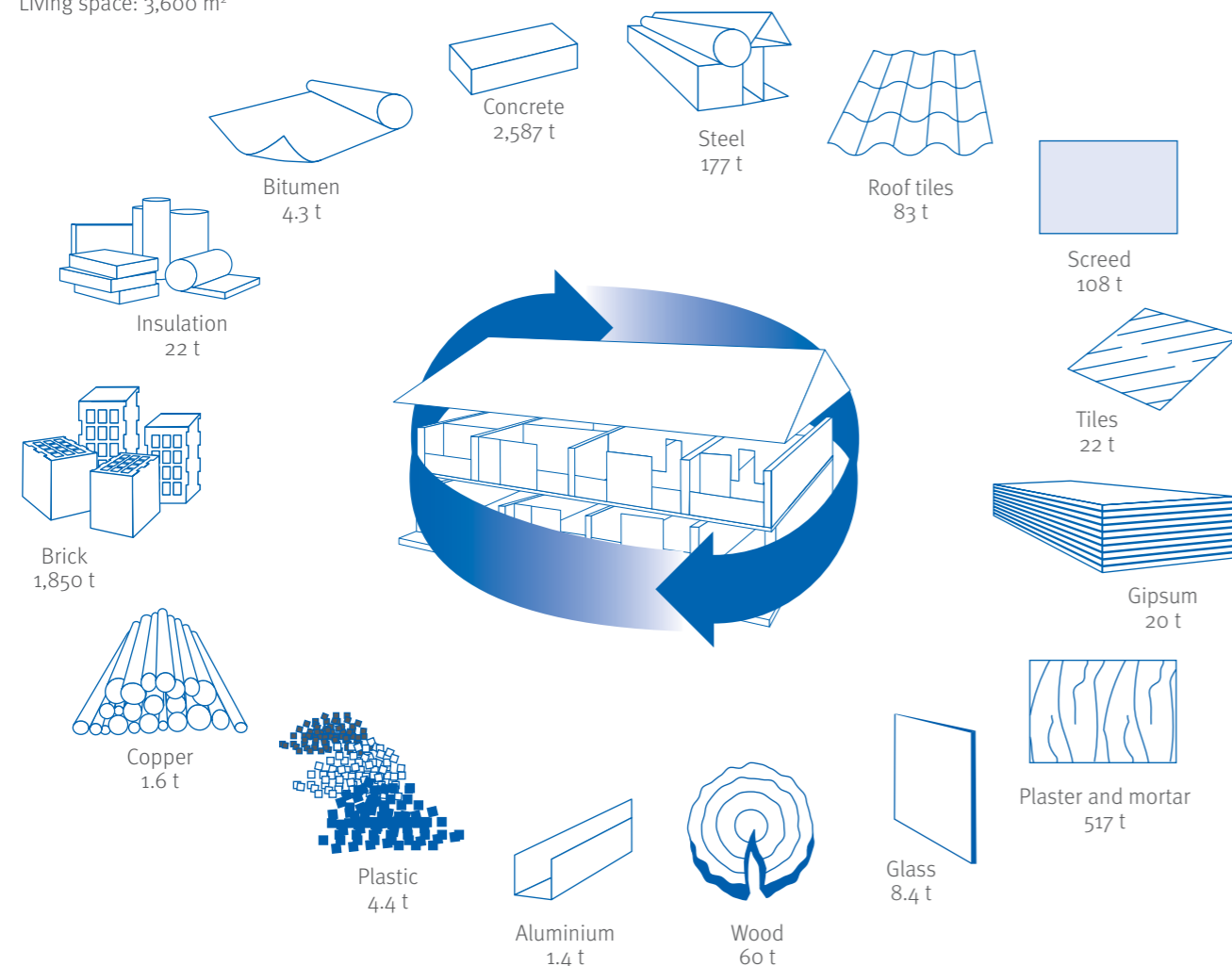


Fig. 14: Construction materials usually used for a residential building, in tons (3,600 m² usable floor area)

Concrete plays a major role in construction (as the diagram shows). We have to put extra effort into developing more sustainable replacements for it and for cement. Development work is already well underway.

Carbon Concrete

Carbon concrete, a combination of concrete and carbon fibers, is stronger, lighter and more durable than conventional concrete. Carbon does not rust and, unlike reinforced concrete, it does not need any concrete cover. The quantity of sand used is therefore significantly lower than for manufacturing reinforced concrete, as are the CO₂ emissions – especially if the carbon is captured from the air. Carbon concrete also scores higher than reinforced concrete in terms of its load bearing capacity and weight. However, the focus here is only on CO₂ reduction; the reuse aspect has not been considered.

Polymer Concrete

In polymer concrete, a plastic (polymer) is used as a binder instead of cement, which gives the material many positive characteristics. When hardened, the product is lighter in weight, which makes it easier to transport and integrate into buildings. Yet the material is stronger than cement concrete and can achieve higher tensile and flexural strengths. Polymer concrete is more vulnerable to impacts, but nevertheless suitable for earthquake zones. Apart from its vulnerability, another drawback is that polymer concrete also only scores points for low CO₂ emissions, not for reusability.

Wood-Based Concrete

Wood-based concrete, or wood-chip concrete, consists of cement as a binder and wood chips or sawdust, which are generally waste products from the timber industry. Impact mills reduce soft-wood, such as spruce or pine, to the required size. Minerals, water and cement are added to produce wood-chip concrete blocks or insulating panels. Finely ground wood replaces more than 50 percent of the grit or sand content by volume.

Unfortunately, this material is not ideal in terms of C2C compliance, as it consists of a mixture of technical and biological materials that cannot be separated and is hard to recycle.

Cement Manufacturing Without CO₂

A key ingredient in the manufacturing of conventional concrete is cement, which has a big carbon footprint. A company called Sublime Systems has developed a procedure by which it is possible to produce cement using only electricity instead of heat, without having to rely on limestone as a source of calcium and accept CO₂ as a by-product. The product is expected to come onto the market in 2023.

Wood for Construction and Upgrading

Not new, but long undervalued: Wood is a great material for construction in terms of CO₂. The carbon stored during the approximately 50 years that the trees are growing continues to be stored after wood is integrated into buildings, at least for the 50 to 80 years that they will be in use. After demolition, untreated wood can either be reused or shredded and used for chipboard. Treated wood currently has to be incinerated in thermal power plants. Private incineration is prohibited.

However, it is questionable whether we even have enough wood in Europe to embark on large-scale timber construction.

Biochar From Waste Wood

Instead of incinerating waste wood, it can be used to produce biochar. The technology employed to do this generates negative emissions and captures carbon, storing it permanently in a stable form. A procedure using biochar as a basis for creating alternative materials made from fossil fuels and aluminum, for instance plastics for façades, has been developed by a company called Made of Air.

Fungi as Insulation Material

The part of a fungus that often grows underground, the mycelium, can be processed into insulating or construction materials; scientific procedures to do this are currently being developed. Combined with blended by-products, the foam-like material produced from mycelium could be suitable as a resource-conserving alternative to plastic, Styrofoam or plywood.

Steel Production With Hydrogen

To reduce CO₂ emissions in the steel industry, first of all the processes for primary steelmaking have to be changed, with hydrogen used as a reducing agent for the iron ore instead of carbon as in the current procedure. Another way to reduce CO₂ emissions is by scrap iron-based electric furnace steel production. This low greenhouse gas-emitting procedure is already being used for around 30 percent of the raw steel produced.

Steel and the by-products of steel manufacturing (e.g. slag) are the starting point for a number of value chains that are aligned with the principles of the circular economy and enable considerable reductions in CO₂ emissions to be made. Steel can be recycled repeatedly without any loss of quality, which also helps to reduce greenhouse gas emissions.

A Truly Circular Economy (Cradle to Cradle®)

Glass Production

The glass industry can make a considerable contribution if it absorbs CO₂ from process gases, converts it into combustible material with hydrogen produced from renewable energy, and reuses it for glass melting.

This looks especially promising in the case of oxyfuel processes, in which the process gas has a high CO₂ content. However, the method is currently also being tested for air-driven machinery to cover the whole range of procedures used in the glass industry.

Aluminum Use

Aluminum is mainly used for windows and façades. The electrolysis process, during which pure aluminum – referred to as primary aluminum – is produced from the extract ore, bauxite, requires a large quantity of electricity. If it is produced from renewable energies instead of coal, the CO₂ emissions can be reduced from 20 to 4 kilos of CO₂ per kilo of aluminum. It is also crucial that aluminum be reused at the same grade if possible (windows made into windows again, etc.). The recycling rate for aluminum is very high, but significantly lower than the demand. The reserves are still being built up.

Flooring

A positive example: carpet tiles with a backing construction using biobased and recycled filling materials store large quantities of carbon and have a large proportion of carbon-negative materials.

Findings

A large proportion of the CO₂ emissions in the real estate sector is produced not just during operation, but already begins during construction. The reasons for this are:

- > energy consumption during the manufacturing (and transport) of the product;
- > chemical reactions as part of the manufacturing processes;
- > inefficient products;
- > insufficient reuse of integrated materials.

This brings us to another segment of the construction industry that has received far too little attention.

Energy efficiency, reduction of CO₂ emissions, and use of renewable energies are now acknowledged to be requirements in the construction industry. However, this is far from enough. In the long term our problem is not a shortage of energy, but of raw materials. As the biggest consumer of global raw materials and the originator of huge quantities of waste, the construction industry has a greater responsibility than almost any other sector of industry.

The reason for this is the linear process by which the sector continues to remove growing quantities of raw materials from the geosphere for the manufacture of construction materials. For a long time this has been causing considerable shortages – for instance in sand mining – as well as harm to the environment. Recycling has improved matters to a certain extent, although recycled materials generally cannot be used for the same purpose as the original materials.

The solution is based on the Cradle to Cradle® concept, the truly circular economy. Cradle to Cradle is an idealized, closed raw materials cycle modeled on nature, in which all the correctly sorted separate raw materials from which a product is made can be reused. Reusable materials will make future buildings into repositories of raw materials.

The circular economy revolves around more repairs, reuse and recycling, and therefore lengthening service lives. The idea is that where possible buildings should be revived instead of demolished, and modernized within reason; if continued use is not possible or reasonable, they should be dismantled and the components recycled instead of being disposed of as waste. For the purpose of sustainable and cost-effective construction, C2C has to be combined with a carbon-free energy supply and optimization of building use by means of digital data and processes. This applies to new builds as well as to the even more challenging renovation of older buildings.

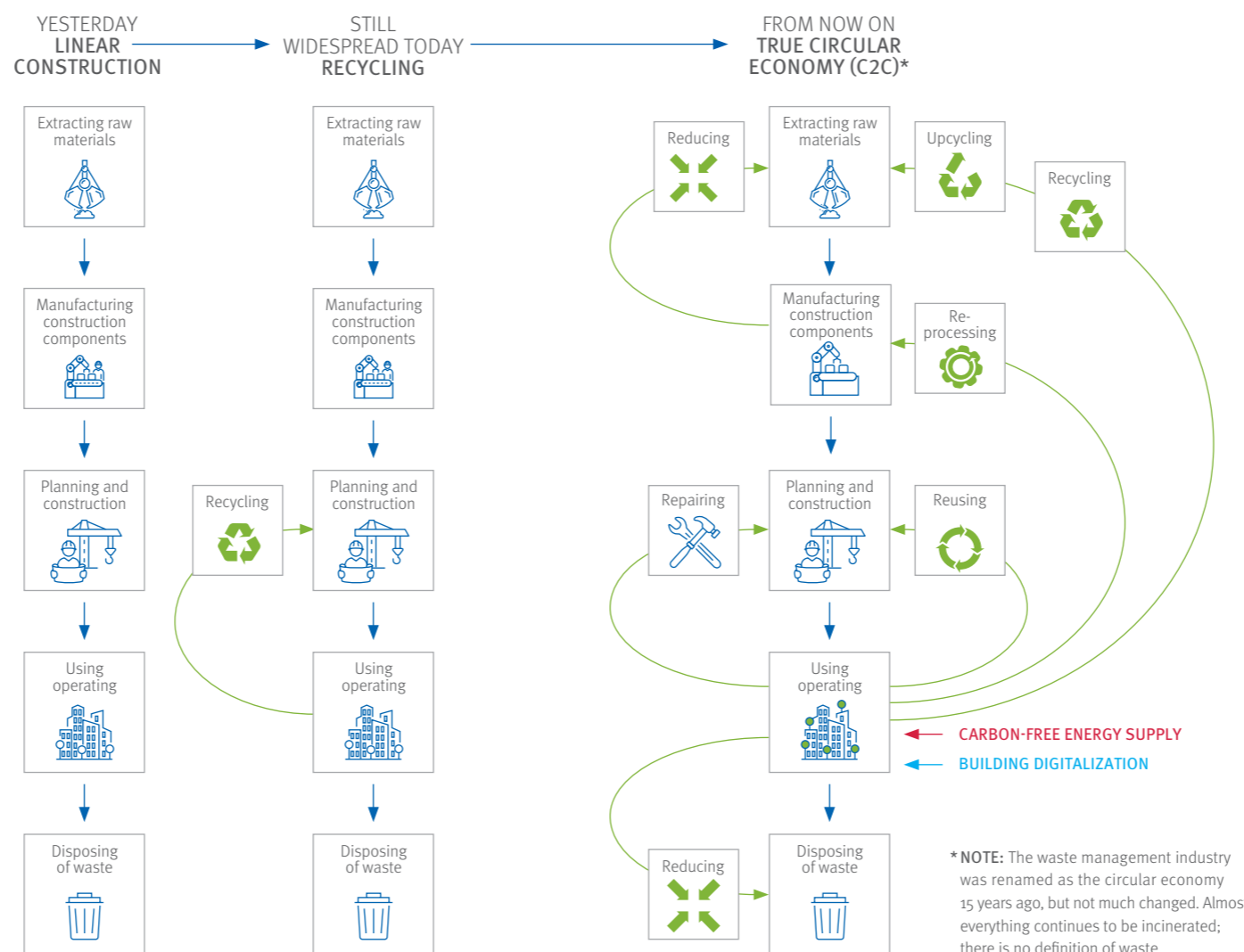


Fig. 15: Changing materials use in the construction industry

Help in planning is provided by good tools such as the **BIM & More plugin** developed by EPEA – Part of Drees & Sommer and Die Werkbank, which brings together a variety of databases and building information modeling (BIM) planning. The product cloud solution enables data to be exchanged between the different participants in the planning phase – including the manufacturers with product data.

C2C AND CO₂ OPTIMIZATION

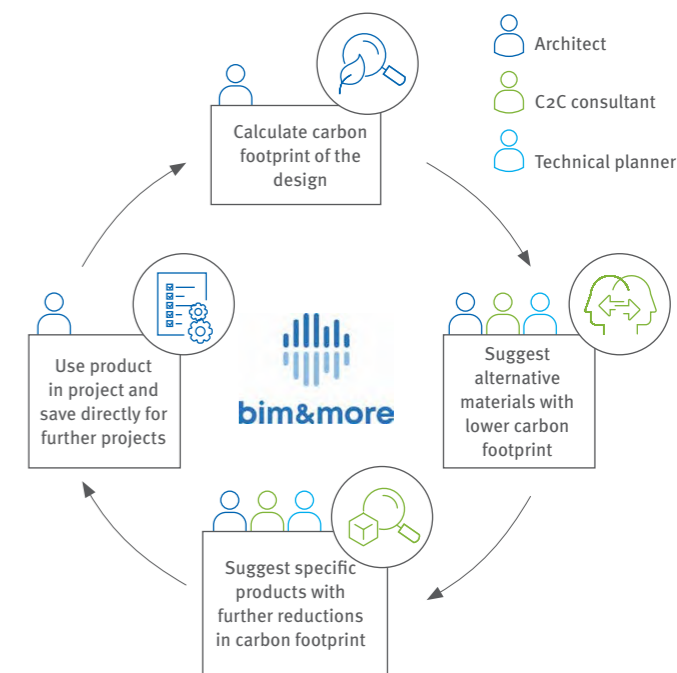


Fig. 16: Combining sustainability criteria with planning, using BIM & More

The tool provides an option to create the building circularity passport automatically on the basis of this data. This enables projects to be planned in a way that minimizes CO₂ emissions while also meeting C2C requirements. This is all combined with extensive product information from EPEA and is aligned with the approaches to industrialized construction involved in blue modularity.

In a BIM cloud storage space, planners can save their own data and share it with colleagues. It is also possible to link to platforms such as Madaster and exchange data at a later stage (for updates). BIM & More also offers a number of opportunities for the use of artificial intelligence (AI).

* NOTE: The waste management industry was renamed as the circular economy 15 years ago, but not much changed. Almost everything continues to be incinerated; there is no definition of waste.

The Approach

Building in line with C2C principles requires a consistent approach, from the preparation and definition of planning content to the handover of the building. In terms of content and cost-effectiveness, this is only possible with digital planning that provides end-to-end database and BIM support.

In the preparation phase the task is to analyze and document the constraints that exist. In the definition phase the client's requirements have to be set out in performance and service specifications and possible grants investigated. In the case of a renovation (e.g. one involving modernization) the scope of the work has to be defined. The first aspects to be considered here are the building fabric and the user requirements. The scope can extend to a gut renovation or even repurposing, as part of a redevelopment. This is a matter of commercial viability and cost-effectiveness.

The requirements of the German Climate Change Act (Klimaschutzgesetz) adopted on June 24, 2021 by the German Bundestag, or national parliament, have a huge impact on new builds and an (even greater) impact on the renovation of existing buildings. The new Act brings the deadline for achieving climate neutrality forward by five years to 2045. To achieve the objective, mandatory targets apply for the 2020s and 2030s. The new German Buildings Energy Act (Gebäudeenergiegesetz) brings a further increase in requirements. C2C compliant construction materials will also have to be selected during design. This can all really only be put into execution by modular construction, in which all the information is documented for the individual modules, down to the individual construction materials.

It makes sense to process the contents transferred from the performance and service specifications to the contractor's specifications as 7D BIM information, or as a digital twin. This includes engineering for energy optimization and circular economy as well as modular prefabrication planning and building digitization and digitalization. In the planning phase it is also important to prepare the facility management and manage everything as a lean design.

In the construction phase, the digital twin is created with the aid of lean construction management. After completion, the carbon footprint and the environmental performance evaluation are documented. An energy performance certificate is drawn up, along with a material passport showing all the materials used and their chemical composition. The commissioning, acceptance and handover phase concludes the project, including all documentation, which also forms the basis for the operation and upkeep of the building as well as future renovations.

The loop of the construction and operation cycle will therefore close more and more in the future, as with circular planning many construction materials can be reused or recycled.

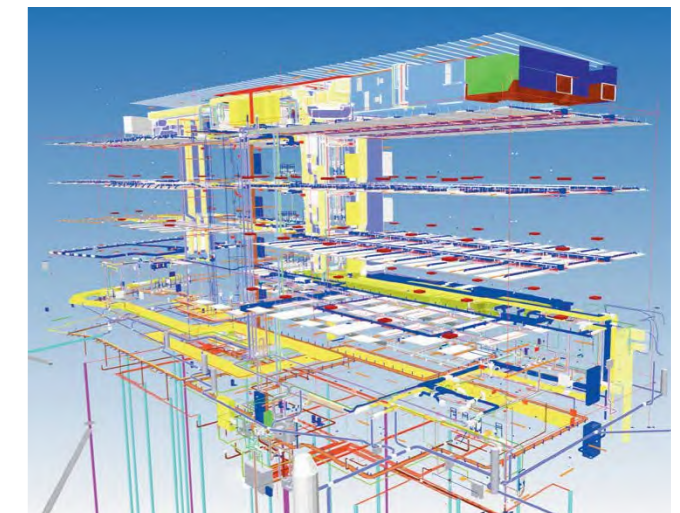
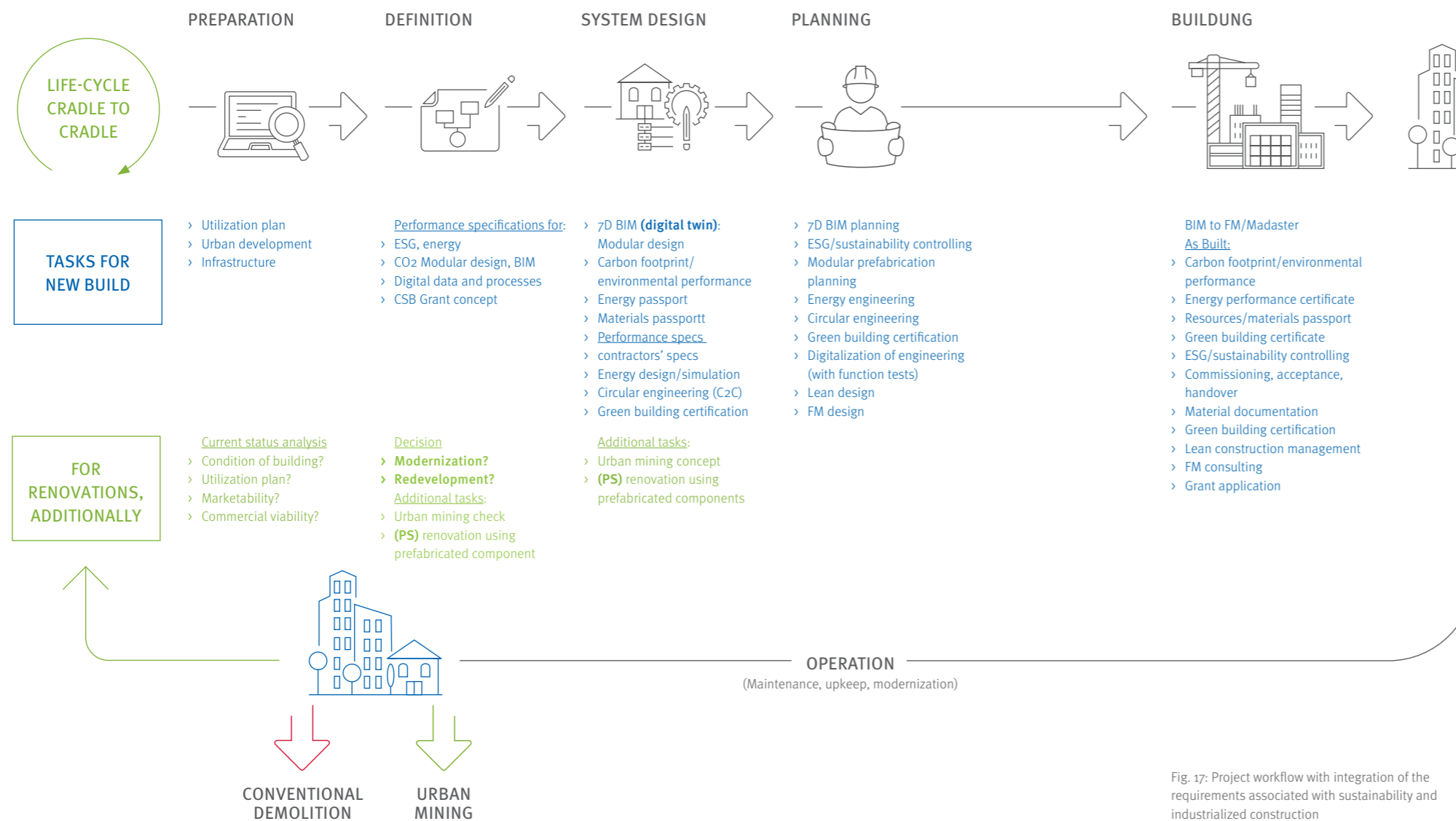


Fig. 17: Project workflow with integration of the requirements associated with sustainability and industrialized construction

Drees & Sommer Innovation Building OWP12: Analysis of the Possibilities in the Living Laboratory

Drees & Sommer's new office building in Stuttgart symbolizes the energy transition in the buildings sector. We designed the plus-energy building to be as recyclable as possible and took care to ensure the materials have no harmful impact on the environment and are easy to dismantle. OWP12 (Obere Waldplätze 12) produces more energy than is consumed during normal operation. This is due to the newly developed, highly insulated façade construction, photovoltaic panels on the roof and on the south-facing façade, and a large-capacity heat pump that uses geothermal energy from boreholes.

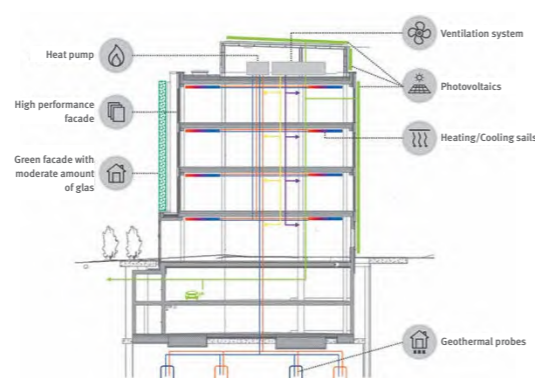


Aided by our subsidiary EPEA, we paid special attention to selecting high-quality, sustainable furniture and materials, using Cradle to Cradle products and C2C compliant materials, where possible.

Although C2C products are not yet available from most manufacturers, CO2 emissions have been reduced by about

Plus-Energy Building

The building owes its energy-plus status to a number of components, the foremost being the geothermal and air-source heat pump and the photovoltaic panels on the roof, which produce 30 percent compared to a 1980s building around two-thirds of the electricity. We also use waste heat from the staff restaurant and the server room throughout the year so that the unavoidable process energy is not discharged unused. The photovoltaic panels in the south and west-facing façades of the building produce the remaining third of the necessary electricity. Additionally, the window parts in the mullion-transom construction also have insulating glass with integrated wafers. This combination of energy systems ensures that during standard operation the building produces more energy overall than is consumed.



The combination of all these energy systems ensures that the building generates more energy overall than it consumes in standard operation.

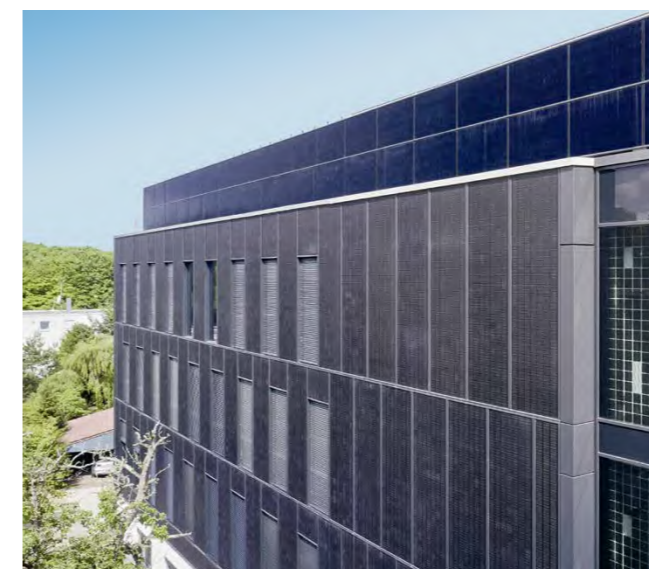
Innovation Façade

Years of experimenting and designing by Drees & Sommer experts in collaboration with façade construction company FKN Group based in Neuenstein, near the German city of Heilbronn, have resulted in a novel type of modular façade construction which, thanks to innovative materials (notably sustainable insulating materials) meets very high standards of soundproofing and thermal insulation with exceptionally thin panels. This ensures high space efficiency and enlarges the rentable area of a building – a huge advantage of this façade, named e-coFACE, which should also be of benefit to our clients in the future.

The façade is also very energy-efficient and even produces energy, as described above. For OWP12 it was perfect. The narrow site, right beside a busy highway feeder road, required a high level of soundproofing and thermal insulation, but also a construction method that used as little space as possible. The thermal shell is only 90 millimeters thick. The complete façade with integrated photovoltaic panels is only 210 millimeters thick altogether. For comparison, the total thickness of a conventional façade construction is 400 millimeters.

“Driving innovation can lead to conflicts with building laws. Strong nerves are needed to resolve disagreements.”

Thomas Berner, Associate Partner at Drees & Sommer



The innovative façade system's fire safety classification also makes it suitable for use in high-rise construction – it has been certified by the Construction Materials Testing Institute of the Technical University of Braunschweig (TU Braunschweig) and has received national technical approval (abZ) from the German technical authority for the construction sector (Deutsches Institut für Bautechnik – DIBt).

The materials used in the e-coFACE meet the requirements of environmental labels such as DGNB, LEED and BREEAM. The underlying insulation material Calostat is C2C certified. The degradability of all parts, which is planned in detail, provides the possibility of sorting by type; the materials can be recycled or reused after their period of use.

Green façade

We planted a part of the façade to create a living wall. The load-bearing panels of the greenery system consist of aluminum girders and Alucobond panels, the aluminum for which came from recycled sources and is in turn recyclable. The green façade is watered with rainwater, which is harvested in three cisterns in the rooftop systems center and distributed via a gravity system, supplemented automatically if necessary by mains water.

The green facade was designed as a pattern and model for other construction projects. In addition to the materials, the operation was also considered.

Customized Smart Building

Digital aids keep operational energy consumption in OWP12 to a minimum. The apps make the work lives of the staff easier: For instance, they can manage access authorizations quickly and easily, book conference rooms, allocate parking spaces in the parking garage, and automatically adjust the settings for heating, cooling, ventilation or lighting to their own needs. We worked on the necessary IT and sensor technology solutions with our collaboration partners, Phoenix Contact and Solo Lighting.

This kind of intelligent IT infrastructure design offers many advantages

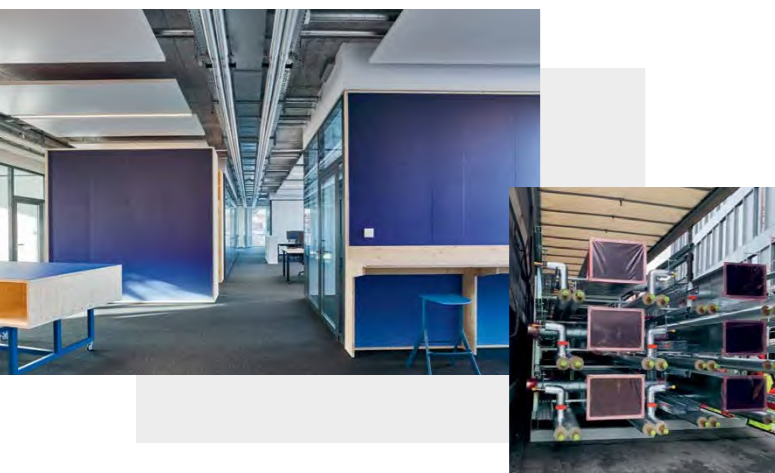
- > Integrated network solution
- > End-to-end security system design
- > WLAN illumination and consolidation points reduce the amount of wiring
- > Power over Ethernet (PoE) – supply to IoT gateways and IT equipment
- > Sensor technology controls displays and switches them on and off

The first steps, such as monitoring and supervision, optimize the interaction of all parts of the system with the aim of improving efficiency in the operation and use of the building.

The MEP Systems Module: Pre-fabricated modular construction components

Eighty percent of building components are currently manufactured on building sites, with only 20 percent being prefabricated. This ratio has to be reversed. Many components can be made anywhere, regardless of the weather, in a factory and then delivered to the building site just in time. For **OWP12**, we developed two prototypes for a new mechanical, electrical and plumbing (MEP) systems module with Würth.

Compact, prefabricated MEP systems components like this require the use of a digital planning method such as building information modeling (BIM). Looking ahead, the data on dimensions, materials or technical properties entered in the BIM models can be transmitted direct to machines or 3D printers, which then produce standardized manufacturing components.



The modules can be transported to the construction site easily and quickly. They are fully assembled in less than 30 minutes. With conventional building methods, this takes around 12 hours. Shifting production of construction components to a factory makes it easier to find skilled labor, and these employees no longer have to assemble the individual MEP components on site, sometimes in cold or hot weather. Prefabrication also increases the quality of the components, for which precision work is required.

The BIM model also functions as a digital memory, which is valuable for later dismantling. Information such as which modules were made with which materials, and where they were used in the building, is precisely defined, so that at the end of the useful life of the building the modules can be removed and either upgraded and used as a unit in the next office building or recycled as individual components. One thing is certain: nothing goes to landfill.

C2C and Circular Economy = Fit for Future Generations

A Building circularity passport issued by EPEA documents the central C2C-related features of every individual material used in the building, for instance its origin and how recyclable and separable it is, and grades it using a traffic light system. There is a direct link to the BIM model of OWP12 in this case also. A BIM visualization of the C2C grade ensures that optimization potential can be identified easily.

Once the project is completed, the Circularity Passport provides detailed information on which materials can be easily separated and the chemical composition of the products used. It also makes it easy to determine the monetary values of the structures used in the buildings. This information about the property provides a great deal of added value for financing from a risk point of view, for determining the value and for the operation of the buildings.

Planning and Construction Efficiency Through Digital Processes and services

OWP12 also sets a new benchmark in the digitalization of the project workflow: Our team used BIM to coordinate ideas, designs, simulations, schedules, contractor's specifications, budgets, and planning permissions. Before the first digger moved in, we were already able to explore the completed building as a digital twin, from the basement right up to the roof. We identified any inconsistencies in the plan or construction early and corrected them before they could lead to delays on the building site.

This was also the first project on which we integrated lean parameters into BIM. The BIM model showed not only the theoretical planning status; a newly created interface with the LCM Digital tool also enabled it to show the actual construction progress of the takt zones and the sequence of work on the construction site.

This enabled us to make and visualize comparisons between the planned processes (target situation) and possible risks and critical interfaces (current situation) clearly and easily in a digital dashboard. A key advantage of these comparisons is that clients can see the current situation at a glance and identify the takt zone in which their construction project is behind schedule, and where it is making good time. This allows the work teams to be deployed significantly more efficiently.

Conclusion

It has become clear that the fundamental need for climate protection in conjunction with the planned new legal requirements for the green heat transition (GEG Building Energy Act) and the concerns of a true circular economy require a completely new type of planning. This will increasingly have to be modular planning in order to be able to implement the requirements with an industrialized or industrial construction method.

Depending on the age of their buildings, existing owners will have to make major investments sooner or later. Figure 18 shows an example of the urgency of the possible need for action. However, the building quality varies greatly due to the construction method, ongoing maintenance and use. Therefore, this can only be a rough indication.

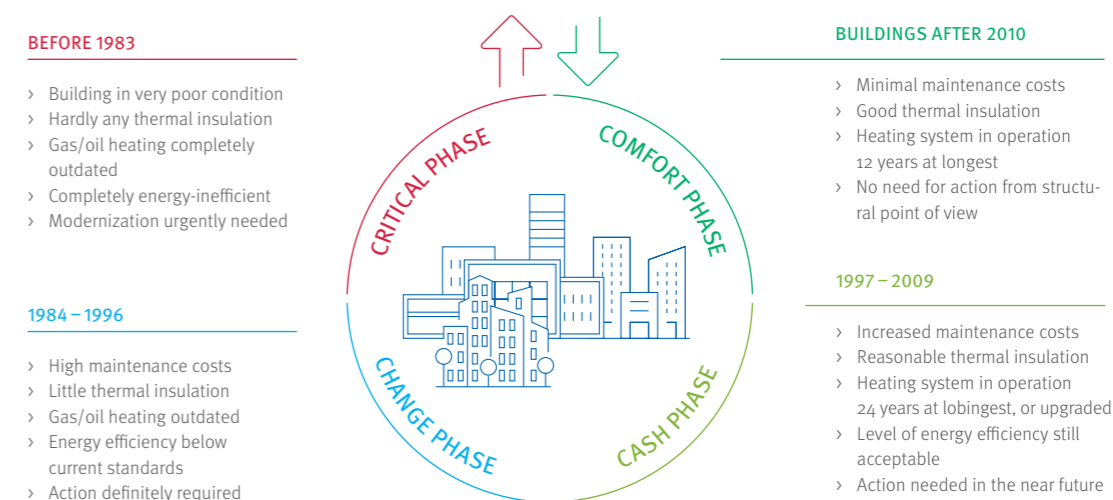


Fig. 18: Action needed for buildings of different ages

The fact is, however, that the new Building Energy Ordinance means that even buildings that are well maintained and in good shape suddenly find themselves in trouble because they have old gas or oil heating systems. In such cases, owners should quickly have an analysis carried out to determine what options are available to them and what the economic consequences might be. In the case of a residential complex, for example, the alternatives vary from refurbishment with no impact on tenants, to refurbishment on an apartment-by-apartment basis with short rent breaks, to the need to evict tenants in the case of large centralized facilities.

In any case, the prefabrication of modules to reduce the duration of renovation work will play a major role, which in turn requires digital and modularized planning.

However, it has also become clear that the need for building renovations no longer depends solely on the age of the buildings. Irrespective of this, the various owners of existing buildings also face very different problems, which are exacerbated by the new legislation, which will be exacerbated by the GEG.

So before jumping into the technical issues, there should always be an overall analysis of marketability, building economics in connection with operation, financing options and a possible exit. Only following such an analysis is the formation of variants of the technical and structural solutions and a feasibility study for the selected variant. In the process, building regulations or other influences can also lead to the selection of a different variant – the "second-best" solution, which is then optimized accordingly.

Drees & Sommer can support portfolio owners throughout all phases as a professional and experienced partner:

- > Analysis of the specific problem
- > Development of appropriate general solutions with economic implications
- > Feasibility study for the selected solution and clarification with the authorities
- > System planning and design
- > Implementation with General Construction Management
- > Consulting on the operating phase

Hans Sommer
May 30th, 2023

ON-SCHEDULE RENOVATION OF THE DEUTSCHES MUSEUM

Client: Deutsches Museum (German Museum of Masterpieces of Science and Technology), Munich | Project duration: Execution phase 1: January 2017 – December 2022, Execution phase 2: Start of clearing July 2022, Opening September 2028 | Architecture: RKW+ and CL-Map, both in Munich | Drees & Sommer services: Project control, commissioning management, user PM, LCM Digital, ACM, general construction management, construction logistics, coordination of the relocation of exhibit | Key data: GFA: 36,000 m² per execution phase

The Deutsches Museum in Munich has made a name for itself in the global museum landscape. Located on an island in the River Isar, the extensive complex attracts well over a million visitors per year – but needed a thorough renovation. After joining the ongoing project, Drees & Sommer has successfully completed the first of two execution phases of the challenging project.



01

THE SITUATION AND THE TASK

By the mid 2010s, the heritage-protected building on an island in the River Isar in Munich was in urgent need of an upgrade, especially to meet fire protection requirements. The extensive work required was scheduled to take place in two phases, but was not to substantially impair the museum's operations. Drees & Sommer experts for major projects and cultural buildings joined the project in 2017.



“Having achieved cost certainty for the first execution phase, we are now working full steam ahead on the second – and, just like the client, are looking forward to completion in 2028.”

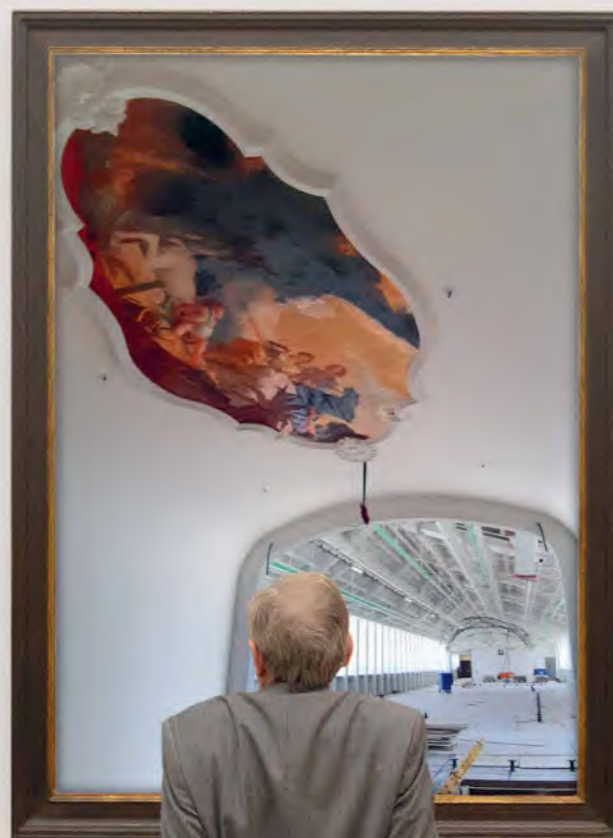
André Schlesiger,
Associate Partner at Drees & Sommer



02

CHALLENGES

Almost everything about the complex project proved to be a challenge: The large number of users and curators with 19 separate exhibitions, difficult prevailing conditions, renovation in stages while ensuring largely uninterrupted museum operation, difficult inner-city construction logistics on an island, the insolvency of several key project participants and – last but not least – the COVID-19 pandemic with its impact on supply chains and availability of service providers.



03

SUCCESS FACTORS

The decisive factor for the success of the project despite the challenges was the high level of personal commitment on the part of the team, which maintains its own project office on site. Having joined the project when it was already underway, the thorough analysis of the entire undertaking in the first 100 days also proved highly beneficial. The effective use of digital tools – such as the cost tool COOR and LCM Digital for schedule control – provided additional certainty. And the close and trusting cooperation with the client was also a big plus, particularly in the final phase of completion, which involved a lot of time-critical work.



04

ADDED VALUE FOR THE CLIENT

By merging four cost tracking systems, Drees & Sommer provided the client with maximum transparency and certainty with regard to project costs. Lean Site Management (LSM) and intensive commissioning management allowed the reliable coordination of all scheduled work. The management of the user project with around 200 contact persons further relieved the client's workload. In the end, the agreed quality levels were met, and the client was able to reopen the upgraded Phase 1 areas on schedule on July 7, 2022.



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 4. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

LIVING IN A LEED GOLD CERTIFIED STUDENT RESIDENCE



The charming city of Bologna is famous for having one of the best universities in the country. Every year, it attracts thousands of students from all over the world. For them, finding suitable accommodation is often a challenge. But since October 2022, the new student dormitory built by the Stonehill International Group offers accommodation for 513 students on about 21,000 square meters of floor space.

The residence has over 485 studios and 28 two-room studios. Each apartment is fully furnished and has a bathroom and a fully equipped kitchen including microwave, oven, stove and refrigerator. The rooms also have a table and chairs and a bed.





The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 4 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Fiera 2000 S.r.l. (Stonehill International Group), London | Project duration: January 2018 – February 2023 | Architecture: TP Bennett, London, Open Project, Bologna | Drees & Sommer services: Project Management, Construction Management FFE, Technical Due Diligence | Key data: GFA approx. 21,000 m², construction cost: >€30m



More than 500 students will find a variety of areas of use in the new residence – inside and outside.

The extensive amenities are a special feature of this student residence, which has facilities for all types of learning, leisure and sports activities: On the ground floor, a huge terrace offers the opportunity to study, eat or relax together. One floor down there is a cinema, a gym, a games room and a laundry. But that's not all: Users can take the elevator to the 15th floor, where there is a large communal kitchen with private dining rooms, more study areas, a yoga room, games rooms, and a large terrace.



Students who want to work out after studying, can get their heart rate up in the gym.

“Pandemic, supply chain crisis, Ukrainian war, rising market prices, and shortage of manpower increased the complexity of the project.”

Matteo Deste,
Project Manager at Drees & Sommer
in Italy

Based on assessment in line with UN sustainability goals, the student residence has been awarded LEED Gold certification. As a result, the project is impressive not only because of its great amenities, but also as a model for the sustainable construction of student dormitories.

Drees & Sommer bore primary responsibility for the overall project. The fact that the Stonehill International Group had already worked with Drees & Sommer in Austria in the past paved the way for a good partnership. The trusting relationship between the client and Drees & Sommer continued as expected and was one of the decisive factors for the overall success of the project.

Transparent project organization processes also contributed to this success. Constant monitoring of schedule and costs by the team ensured that everything went as planned. The experts also made sure that the tendering process remained clear-cut for the general contractor. The result is an impressive student residence in Bologna that meets both students' needs and ecological requirements.

The brightly colored seating in the lounge offers a relaxing setting after a day of study.



PUBLIC SECTOR CLIENT REALIZES FLAGSHIP PROPERTY

The Rhineland Regional Council (LVR) is moving into a highly sustainable new office high-rise in Cologne, which provides more space and features an innovative workplace concept. Drees & Sommer experts were planners and consultants for the project.



© kadawittfeldarchitektur

Client: Landschaftsverband Rheinland (LVR) – Building and Property Management, Environment, Energy, Cologne; Bauen für Menschen GmbH, Cologne | **Architecture:** kadawittfeldarchitektur gmbH, Aachen | **Project duration:** November 2017 – November 2026 | **Drees & Sommer services:** iDS Planning (BSE, Building Systems Engineering, BPH Business Process Hierarchy with simulation), iDS Consulting (EDS, certification), Modular Construction, Digitization, Sustainability | **Key data:** GfA: 54,000 m², Construction cost: €165m (cost groups 300 + 400)

The central administration of the LVR has grown steadily over recent years. The existing buildings were no longer able to meet the increasing demand for office space, and leasing additional space only gave temporary relief.

“One of the most sustainable high-rise properties in North-Rhine Westphalia – a landmark for Cologne.”

Frank Kamping
Associate Partner at Drees & Sommer

Faced with this situation, LVR explored various courses of action. In the end, they decided to build. As a result, a 70-meter building with two smaller adjacent buildings – scheduled to be completed by 2026 – is taking shape on Otto-Platz in Cologne. Using a flexible office concept, it can accommodate around 1,200 workstations and, depending on the desk-sharing quota, thus space for 1,500 or more LVR employees. From the very beginning, the client’s key goal was for the building to be sustainable and climate positive. This approach is reflected both by the facade and the fitout (in the choice of carpets, furniture, etc.). The LVR wants the building to achieve DGNB Platinum certification. Measures aimed at achieving this include efficient climate regulation, cooling and heating with geothermal energy (water from the Rhine), and extensive roof greening for rainwater retention and summer cooling.

Drees & Sommer was awarded contracts for a wide range of planning and consulting services for the project, with a focus on the optimal combination of sustainability, technology and cost-efficiency. For example, the use of water from the Rhine requires an innovative energy concept, while at the same time adhering to the budget and schedule. Drees & Sommer is also responsible for intelligent building control and the use of recyclable materials in accordance with the Cradle to Cradle® principle.

All this is made possible by the teams extensive expertise and also by continuous exchange with the customer, particularly on a personal level. Such exchanges can take place at any time, not least because the specialists are close to the project site.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3, 6, 7 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

THE TERRACE: HIGH-END DESIGN ON THE BANKS OF THE RIVER SPREE

Having the right feel is key to helping a company identify with its premises. Because in addition to the right amount of space, the appropriate size and programming of a building, the emotional component has to be right – and this is determined by interior design and the forms and colors used. The new headquarters of ANH Hausbesitz in The Terrace is a state-of-the-art office building and an excellent example of how corporate identity can be perfectly expressed in space.

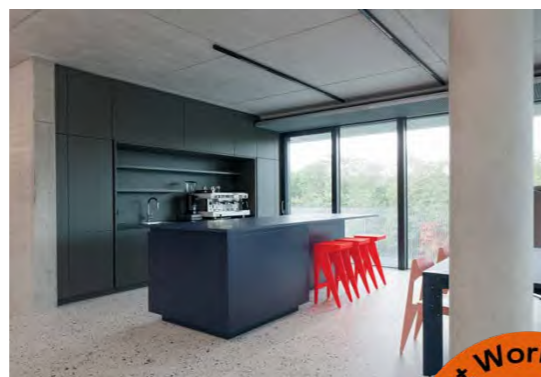
Built on the banks of the River Spree in Charlottenburg, Berlin, The Terrace is a modern, high-quality eight-storey office building with an underground car park. The ANH Hausbesitz offices on the second floor combine a spectacular color and design concept with versatile common areas and smart services. Spacious outdoor areas and the subtle interplay of materials, colors and reflections transform the work environment into a vibrant place that changes in surprising ways depending on the light, the season and the viewer's perspective. Continuing this theme – and matching the riverside location – the office space is designed to evoke a Riviera ambience: shimmering reflections, elusive moods, and a hint of poetry.

In close collaboration with ANH, Drees & Sommer created a user-centric design concept for the work environment to promote and establish the culture of New Work in the company. The challenge was to identify the needs and wishes of ANH employees and, based on this, to create a work environment that is both efficient and attractive.

As a smart office building, The Terrace fulfills all wishes for working in a digital world. Architecture by AHM Architekten.



Shimmering, reflective, poetic:
The „Riviera“ design concept runs like
a thread through the office building.



Deservedly award-winning:
Within the strong architecture, material
and color contrasts come together
to form a coherent picture.



Client: ANH Hausbesitz GmbH & Co. KG, Berlin |
Project duration: 2019 – 2022 | Architecture: AHM Architekten BDA,
Berlin | Drees & Sommer services: Brand Experience, Workplace
Consulting, Interior Workplace Design Service Phases 1–7,
Artistic Site Management, Creation, Support and Implementation
of the Digitization Concept, Support for WiredScore and SmartScore
Certification | Key data: GFA: 830 m²

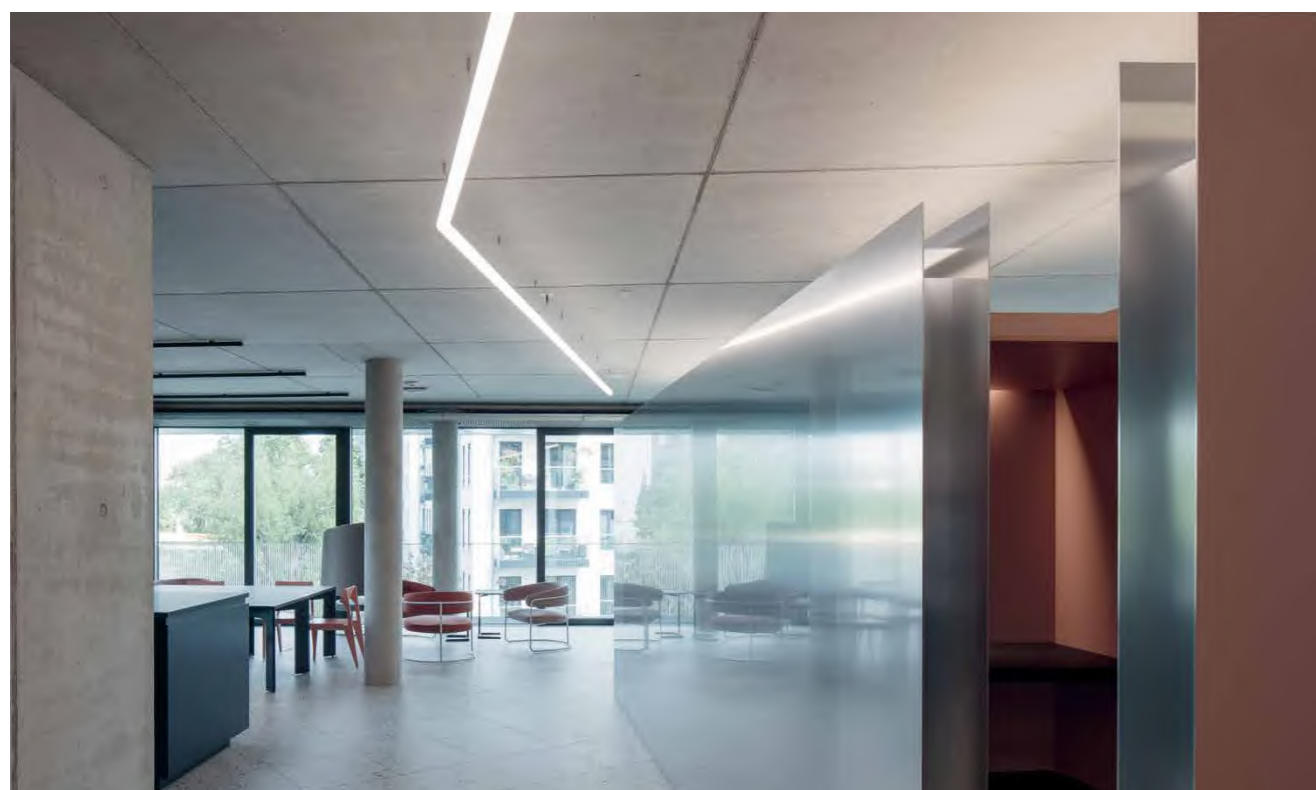
“A real ‘place to be’
can only be created
if the focus
is on the users.”

Annette Schorr,
Design Leader at Drees & Sommer

In addition to the design of ergonomic workplaces and attractive common areas, the team also created rest and relaxation zones. The common areas also feature informal meeting places to encourage chance encounters to promote communication and collaboration between employees. The result is a work environment that increases employee motivation, satisfaction and productivity, thus also contributing to the long-term success of the company.

Inlay walls with intricate, high-quality details were specially developed for ANH and are the key design element for the creation of zones. Materials with a range of textures, optics and color palettes result in huge variety: While focus booths and meeting rooms are enclosed in black-tinted, reflective glass walls, zone walls are made of anodized aluminum and have silvery reflective surfaces. The inlay walls contrast with the rough concrete ceilings and terrazzo floors. Cube shelves are installed at the base of inlay walls inside rooms, and in the workbench area, open-plan telephone niches nestle between the walls.

Inlay walls developed individually
for ANH define different zones.



“It’s fascinating what happens between the various hues.
It’s something unpredictable, something poetic – like the flair
of the Riviera.”

Alexander Strub,
Creative Director at Drees & Sommer

In addition to the special design, the building’s sophisticated digitization concept is impressive, and has achieved the SmartScore Platinum seal with the maximum number of points. This is thanks to the in-house app, which allows smart, digital control of the entire building – from the doors and the elevator to all room bookings, and from heating to lighting to solar protection. All this is complemented by state-of-the-art security standards and a comprehensive cybersecurity concept. Drees & Sommer supported ANH throughout the process, from the Digital Ready Check and definition and the implementation of the digitization modules through to successful certification.

The design of the new ANH Office has also drawn international recognition: It was selected as one of the 50 Best Workspaces 2023 by the renowned publishing house Callwey Verlag, received a Special Mention for Outstanding Design Quality at the German Design Award 2023 in the category ‘Excellent Architecture – Interior Design’, and was also awarded the iF Design Award 2023.

HAMBURG'S UNIVERSITY PROPERTIES UNDER THE MICROSCOPE

From lecture halls to sports halls, labs to administrative buildings: The Free and Hanseatic City of Hamburg owns a wide range of university buildings. A Drees & Sommer team assessed the condition of the buildings and calculated their operating and lifecycle costs.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 4, 7 and 13. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Sprinkenhof GmbH and GMH, Gebäudemanagement Hamburg GmbH |
Project duration: April 2022 – April 2023 | Drees & Sommer services: Creation of Document Checklists, Room Books, Asset Registers, Valuation Matrices, Investment Cost Estimates, Operating Cost Estimates, Lifecycle Cost Estimates

Timo Fitzer squeezes his way up the narrow stairs to the attic. Mind your head! “This is where the air raid wardens kept lookout during the Second World War,” explains the real estate expert. “During air raids, their role was to raise the alarm and extinguish incendiary bombs while everyone else took refuge in air raid shelters.”

If you look out of the window today, you will see students strolling between seminar rooms, the library and the canteen. Dating back to 1885, the brick building on the campus of the Hamburg University of Technology is heritage protected. It is now used as a library and administration building and is part of a portfolio of around 60 university properties spread across 10 campuses that the city-owned company Sprinkenhof GmbH arranged to be comprehensively evaluated in 2022.

HOW DID YOU FIND WORKING WITH DREES & SOMMER? HOW DID YOU FIND WORKING WITH DREES & SOMMER? HOW DID YOU FIND WORKING WITH DREES & SOMMER?

Very pleasant. Our cooperation was constructive, systematic and reliable. It was remarkable how quickly we were able to get together for coordination meetings. That's certainly not a given for a project of this scale.

Frank von Wehren,
Head of Department,
Sprinkenhof GmbH

The aim is to transfer the buildings to the tenant-landlord model introduced in Hamburg in 2012. The Free and Hanseatic City of Hamburg wants to use this model to ensure, among other things, that property values are maintained and increased.

Clarity regarding the status quo

“But before Sprinkenhof and GMH, as the city's implementation agencies, can know what cost and maintenance fees they need

to set, they need an overview of all the properties,” explains Timo Fitzer. He is the project leader and one of around 20 Drees & Sommer experts working on the project. “What condition are the buildings in? What are the estimated operating costs? What investment costs will the city, as the owner, have to reckon with in the coming years? And what is the status of fire protection and accessibility” he says, naming some of the key questions the team examined in depth.

WHAT ROLE DID SUSTAINABILITY PLAY IN THE PROJECT?

WHAT ROLE DID SUSTAINABILITY PLAY IN THE PROJECT?

This role developed progressively over the course of the project as we increasingly addressed sustainability issues, such as assessing the energy-efficiency of existing buildings and whether there was scope for using photovoltaics.

The experts for building construction, building services equipment and facility management had to assess a wide range of properties, some having been built in the 1880s, others through the 1970s and up to the 2010s. The building types range from administrative buildings, laboratories and lecture halls to sports halls and an observatory. The smallest building houses a telescope and has a floor area of just 17 square meters.

Flexible pricing model for the clients

The highly varied portfolio made it all the more important to develop a pricing model that would enable the client to flexibly and progressively commission the assessment of additional properties and spaces – and at a reliable price based on the type of use and square meterage. Given the size of the portfolio, the clients had originally assumed that they would need at least ten different companies to work on the assessments, and had divided the work into packages. But Drees & Sommer ended up assessing some 60 properties with a total area of 400,000 square meters in less than a year – thus handling the lion's share of the portfolio. The team successfully completed the project to the client's satisfaction.

Frank von Wehren,
Head of Department,
Sprinkenhof GmbH

HOW WILL YOU CONTINUE TO USE THE RESULTS OF THE INVENTORY?

At the moment, we are evaluating the results to create the basis for putting a concrete proposal: What investments make sense in order to ensure cost-efficient operation of the buildings in the long term?

Tobias Poburski,
Team Leader Technical Support,
Sprinkenhof GmbH

Approx **60** university buildings



10
CAMPUSES

ABOUT
12
MONTHS



Some **20** Drees & Sommer experts

Approx. **400,000** m² GFA

Dating
from 1880s
to 2010s

Smallest
building
just **17** m²



Largest
building
35.000 m²



Approx. **500** individual documents created (including document checklists, room books, asset registers, valuation matrices, estimates of investment costs, operating costs and lifecycle costs)

FROM GREY CONCRETE TO AN URBAN OASIS

For Siemens, it will be the company's first carbon neutral site worldwide – and for Germany, the project is one of the largest timber-concrete composite construction sites: A pioneering campus will be built on the former Siemens research site over the next ten years.

In 2013, Siemens decided to modernize the site. The old company building, with the size of more than 75 football pitches, was to be transformed into an open, urban campus linked to the city. The special feature of the new concept is that it combines modern living, working and social environments for Siemens employees and the residents of Erlangen alike.

Following the previous opening of Module 1, Module 2 of the campus was opened shortly before Christmas – on December 19, 2022. This represented a major step towards the completion of the entire project, which will take place in several stages into the 2030s. The central reception building in Module 2 is considered the new 'face' and flagship of the global corporation in the Erlangen-Nuremberg metropolitan region. In addition to offices, the ground floors accommodate a diverse range of publicly accessible food and beverage and service offerings.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 7, 9 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

The sustainable reception building with an open foyer serves as the new 'face' of Siemens in Erlangen.



“An open campus instead of a closed factory site: Supporting such an exciting large-scale project from demolition to new construction is something really special.”

Daniel Bechmann,
Overall Project Manager,
Module 2 at Siemens

Following the opening, some 17,000 Siemens and Siemens Energy employees will work in 22 new buildings on the campus. In addition to the central reception building, these include the new research and laboratory building, the Siemens Training Center, 12 office buildings, and 6 multistorey car parks with almost 5,000 parking spaces complete with e-charging stations and 2,300 bicycle parking spaces.

As part of overall project management, Drees & Sommer has been supporting Siemens Real Estate with a full range of services for more than eight years. Contracts were progressively awarded for areas ranging from development management and infrastructure, BIM, logistics, and user consulting through to lifecycle assessment and Green Building certification.

The Siemens Campus is one of the largest real estate projects Siemens has ever undertaken anywhere in the world.

Based on their steady comprehensive cost and schedule control over many years, the team established itself as a competent and reliable partner for the client. Despite some extremely difficult conditions – ranging from contractor variations and COVID-19 to project delays – the schedule for Modules 1 and 2 was adhered to, with costs even coming in below budget. This was made possible by the project team’s expertise and the long-standing cooperation with the client, which was facilitated by their use of a joint project office.

Construction work continues in full swing: Drees & Sommer will continue to support the project as it develops into a vibrant urban district with contemporary buildings, modern office infrastructure, and laboratory and research workplaces. Siemens will become part of the city like never before, contributing to the Sustainable Development Goals with affordable, clean energy, sophisticated infrastructure and asustainable campus design.

Client: Siemens Real Estate | Project duration: 2019 – 2022 |
Architecture: KSP Jürgen Engel, Frankfurt |
Drees & Sommer services: Development Management,
Project Management, Green Building Certification, BIM Controlling,
Logistics and Process Control, User Consulting, Strategic
Consulting, Cost Tracking | Key data: GFA: 75,000 m² (Module 2)
(Module 1 = an additional 100,000 m²)



A BETTER SHOPPING EXPERIENCE IN THE BORDER TRIANGLE

This is where Swiss, French and Germans can all meet when they go out for a stroll. The Dreiländergalerie Weil am Rhein, which opened in autumn 2022, is now the premier retail destination in the region.



The broad corridors are flooded with natural light.

The outside of the center is characterized by sweeping arcs of glass and shimmering metal. And the interior features generous light-filled spaces with broad concourses, harmonious forms, warm colors and esthetic lighting. People coming to Weil am Rhein and strolling through the Dreiländergalerie encounter a truly international ambience. They can find shops and brands from all over the world on three levels, and the large food court offers a global culinary journey.

“On-schedule opening of a project like this is the key discipline. And we managed it! Everything came together perfectly.”

Ralph Scheer
Partner at Drees & Sommer

The shopping center attracts people from all three countries in the border triangle – and is easily accessible: The train station and the terminus of the cross-border tram line to Basel are just a short distance from the shopping center – and there are 560 customer parking spaces in the underground car park.

But the attractive location also posed challenges during construction, as the center is located between a federal highway, a high-speed railway line and a tram bridge. It was essential to ensure that there were clear agreements and excellent communication between stakeholders throughout the project.

The client, CEMAGG GmbH, relied on Drees & Sommer construction management services to ensure the successful realization of the project. This approach ensured Project Management and Integrated Construction Management from a single source. The client had the advantage of having a multidisciplinary team responsible for managing the planning, contract award and construction of the Dreiländergalerie, while the use of Lean Construction Management kept the focus on the overall process. The team and the client jointly defined the project goals, a new organizational structure and relevant milestones. The project team was also responsible for tenant coordination for the 70 shop units.

The border triangle is a unique meeting place for three countries, languages and cultures – and now also a destination for discerning shoppers.

Client: CEMAGG GmbH |
Project duration: May 2020 – October 2022 |
Architecture: Chapman Taylor |
Drees & Sommer services: Construction Management, Tenant Management | Key data:
GFA: 65,200 m², Construction cost: €160m

THE FUTURE BELONGS TO RAIL



Also currently at the planning stage: The Sossenheim train stop for the rail bypass.

The Regionaltangente West (RTW) is a new rail bypass being built in the Rhine-Main region to improve local public transport in the Frankfurt metropolitan area. Drees & Sommer won the Europe-wide tender for this key project.

Traffic density in the Frankfurt Rhine-Main metropolitan area is one of the highest in Europe. The existing rail network has been under strain for years as the result of a thriving economy and a steady increase in the number of commuters and residents. The Regionaltangente West (RTW) rail project is designed to meet this growing demand.

Running to the west of the city of Frankfurt, the RTW rail bypass will connect the surrounding districts and towns, and create new direct links between the districts of Hochtaunus and Main-Taunus, Frankfurt Höchst, Frankfurt Airport, and the district of Offenbach. With a total track length of 52 kilometers and 28 stops, the main objective of the new rail bypass is to ease congestion at the Frankfurt Central Station junction and on the extremely busy lines to central Frankfurt.

This visualization shows the new 'Dunantsiedlung' stop with the future dual-track RTW railway line.

Client: RTW Planungsgesellschaft mbH, Frankfurt | Project duration: June 2021 – December 2028 |
 Architecture: PG RTW, Frankfurt | Drees & Sommer services: Digital Project Management,
 Client Consulting, Lean Construction Management, Project Analysis (PAST) |
 Key data: Route length: 52 km; number of stops: 28 (12 established), passengers per day: > 30,000,
 Construction cost: €1.0 bn



The RTW2 line connects to the RTW line in Eschborn-Ost.



Between the station „Stadion“ and the parking lot „Gleisdreieck“ a bar arch bridge is built.

“The project team works together every day to ensure that the RTW rail bypass will provide new direct rail links for passengers in the Frankfurt region from 2028.”

Hans-Peter Semmler,
 Team Leader at Drees & Sommer

Drees & Sommer joined the project during the approval phase. Parallel activities in all architectural and engineering phases, combined with almost parallel approval and infrastructure approval procedures in three phases with fixed completion dates, demanded a high level of commitment from the project team. Scheduled for completion at the end of 2028, the project is also very much in the public eye, not least because it is mainly publicly funded. Close coordination between the project company RTW and German Rail (DB) is also required with regard to the conversion and expansion of DB assets.

Drees & Sommer has so far mastered all challenges thanks to the team members' high degree of flexibility. The client is also benefitting their extensive technical expertise and close supervision of the rail construction work.

For example, infrastructure planning is subjected to a rigorous review process implemented by Drees & Sommer at all stages up until the start of construction. Early conceptual design and concurrent coordination with the client will ensure punctual commissioning to enable the start of regular operation, while intelligent control methods and measures keep additional planning, construction and maintenance costs to a minimum.

The project shows once again that rail is on the right track for the future.

From Neu-Isenburg, the RTW runs on a DB line and then dives into a tunnel.



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 9. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

ON THE WAY TO BECOMING A BENEFICIAL COMPANY

BENEFICIAL COMPANY



Drees & Sommer is committed to sustainable corporate development. To make our aspirations a reality, we align all our activities with our beneficial company strategy. As a beneficial company, it is our goal to give back to the environment and society more than we take through our business activities. For us, being 'beneficial' means not only actively avoiding negative impacts by our commercial activity, but also seeking to regenerate our resources. Our beneficial company strategy is based on a holistic understanding of sustainability that aims to maximize the positive impact on the environment and people. To ensure that we succeed in this, we work single-mindedly to make sustainability an integral part of all the company's divisions, processes and consulting services.

- A**
 - AVOID/REDUCE/COMPENSATE
 - > Business travel
 - > Energy
 - > Water
 - > Materials
 - > Greenhouse gas emissions
- E**
 - ENVIRONMENT
 - > Climate-friendly mobility
 - > Renewable energies
 - > Protecting natural resources
 - > Promotion of biodiversity
 - > Circular Economy
- S**
 - SOCIAL
 - > People-oriented leadership
 - > Diversity and Inclusion
 - > Health and Wellbeing
 - > Education and learning
 - > Social engagement
- G**
 - GOVERNANCE
 - > Value orientation and transparency
 - > Compliance
 - > Sustainable innovations
 - > Sustainable finance
 - > Intern. standards (SDGs, UNGC, GRI, SBTi)



SUSTAINABLE DEVELOPMENT GOALS
The 17 Global Goals agreed by the United Nations came into force on January 1, 2016. They serve as a blueprint for economic, social and environmentally-sustainable transformation toward a sustainable global community.



Drees & Sommer's commitment draws on the **Sustainable Development Goals (SDGs)** of the United Nations' 2030 Agenda for Sustainable Development. In our consulting projects, our innovative solutions make an active contribution to the sustainable transformation of the real estate and infrastructure sector. Our wide range of services is in alignment with the majority of the 17 development goals. However, our consulting projects make a particularly substantial contribution to the achievement of the following SDGs (see reference projects in our report):



To underline the company's sustainability orientation, Drees & Sommer has signed up to international sustainability initiatives. By joining the **United Nations Global Compact**, Drees & Sommer and a large number of other companies have shown their commitment to responsible management. The organizations participating in the initiative commit to aligning their activities and strategies with ten principles relating to human rights, labor standards, the environment and preventing corruption. In an annual Communication on Progress, companies report on the implementation status and their activities to promote sustainable development.

Building on measures already in place to reduce greenhouse gas emissions, we joined the **Science Based Target Initiative (SBTi)** in 2021. By 2024 we will publish a science-based decarbonization target that meets the requirements of the Paris Agreement and determines our future company climate strategy.

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SUSTAINABILITY MISSION STATEMENT

In the Sustainability Mission Statement issued at the end of 2022, the Executive Board summarized its understanding of sustainability in a clear way for all internal and external stakeholders.

WE SUPPORT

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THE SCIENCE BASED TARGET INITIATIVE (SBTi) is an alliance of the UN Global Compact, Carbon Disclosure Project, World Resources Institute and the World Wide Fund for Nature. Under the initiative, companies commit to setting and implementing their own greenhouse gas emissions reduction targets. The target setting is based on science to ensure that the goals of the Paris Climate Agreement are achieved. To this end, SBTi has developed its own standard based on the GHG Protocol.

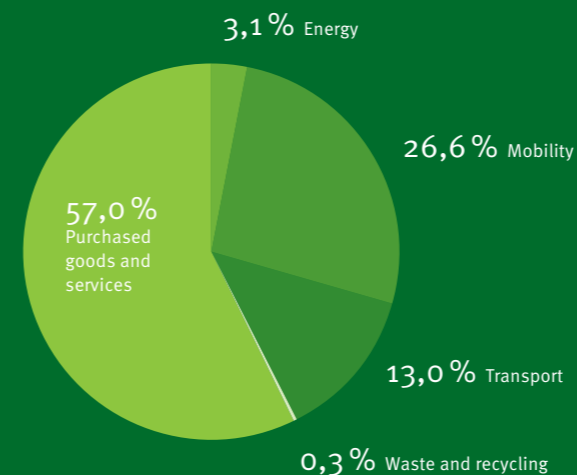
INSIGHTS: ECOLOGIC SUSTAINABILITY GREENHOUSE GAS INVENTORY 2022 AND CLIMATE TARGET

Drees & Sommer calculates and recognizes all greenhouse gas emissions connected to its business operations. The greenhouse gas inventory is based on the internationally recognized standard 'The Greenhouse Gas Protocol' and the pertaining standards for scopes 1 to 3. All climate-relevant greenhouse gas emissions of scopes 1, 2 and 3 that fall under the operational control of the company are included. The data basis for the calculation of the emission factors is obtained from ecoinvent 3.6 (IPCC 2021 assessment method; GWP 100a). As in the previous years, the framework for preparing our 2022 greenhouse gas inventory was defined by myclimate. The result and the assessment method were validated by the consulting company Stakeholder Reporting.

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The international non-profit organization myclimate sees itself as a partner for effective climate protection. Together with industry partners and private individuals, the organization has been shaping the future of the world through a holistic offer of consulting, educational programs and own climate protection projects for more than 20 years now. With its projects, myclimate promotes measurable climate protection worldwide and contributes towards achieving the UN (SDGs) climate targets.

GREENHOUSE GAS EMISSIONS BY CATEGORY



At 57 percent, the biggest share of emissions is attributable to purchased goods, services and other investments made. An important part of our greenhouse gas emissions (almost 40 percent) is due to the categories 'mobility' (business travel and commuting) and transport (own vehicle fleet). Company-wide, our greenhouse gas inventory stands at 32,706.1 metric tons of CO₂e.*

* Figures based on metric tons of CO₂e equivalents. The assessment takes into account all relevant greenhouse gases, as defined in the Greenhouse Gas Protocol.

Greenhouse gas emissions are divided into three scopes according to the Greenhouse Gas Protocol. This categorization makes it possible to distinguish where the emissions originate from: at the company itself, or in upstream or downstream processes of the added value chain, e.g. manufacturing, transporting and using goods (scope 3). The emissions within the added value chain are divided into 15 categories. Not all categories are relevant for and applicable to each company. This is also the case for Drees & Sommer.

INSIGHTS: SOCIAL SUSTAINABILITY DIVERSITY AND INCLUSION

In preparation for the definition of a science-based emission reduction target, the inventory was compiled in line with the requirements of the **Science Based Target Initiative (SBTi)** for the first time in 2022. While in previous years it was only possible to collect some of the scope 3 emissions data, for 2022 all the data was reflected. For this reason, our overall inventory is significantly higher when compared with previous years.

The framework for preparing our global corporate inventory was defined together with myclimate for 2022 as follows:

- Scope 1:** heating for buildings (fuels used), refrigerant loss and company cars
Scope 2: electricity for buildings, district heating/cooling
Scope 3: purchased goods and services, capital goods, upstream emissions of electricity and fuel usage, operational waste, business travel, staff commuting and investments made

| GREENHOUSE GAS EMISSIONS BY BUSINESS GROUP AND SCOPE | | |
|---|-----------------|--|
| Scope 1 | 3,687.5 | 11 % |
| Scope 2 | 527.3 | 2 % |
| Scope 3 | 28,491.3 | 87 % |
| Total | 32,706.1 | (metric tons of CO₂e*) |

* Figures based on metric tons of CO₂e equivalents. The assessment takes into account all relevant greenhouse gases, as defined in the Greenhouse Gas Protocol.

STRATEGY: AVOID, REDUCE, COMPENSATE

Starting with the compilation of the greenhouse gas emissions inventory, Drees & Sommer identifies a number of measures to reduce the ecological footprint of all the company's divisions and processes. While we consider offsetting as an additional (temporary) way of compensating for unavoidable emissions, we always focus on avoiding and reducing greenhouse gas emissions.

In 2022 as in the previous years, we offset greenhouse gases equivalent to 15,000 metric tons of CO₂e according to the Gold standard. To curb global biodiversity loss, we also finance the planting of 75,000 trees every year.

To capture all relevant emission factors, in the past year we optimized our data collection. As we work out our SBTi climate action pathway, we are developing additional measures for avoiding, reducing and compensating emissions in the light of the results of the extended emissions inventory. We are able to build on solutions already implemented, including:

- › use of green electricity;
- › use of photovoltaic systems;
- › implementation of a sustainable mobility concept;
- › use of recyclable products;
- › expansion of our compensation portfolio.

An important factor in Drees & Sommer's success is the diversity within our teams and the fact that we value differences and put them to good use. Because BLUE IS BOUNDLESS. But whether it is about inclusive language or everyday racism, pigeonholing, queerness or age, a lot of our discriminatory behavior is unconscious or subconscious. Our first Diversity Week was about creating awareness of behavior that promotes diversity. With talks in German and English, a virtual diversity circuit, and personal get-togethers, we explored the subject of diversity. More than 1,200 people participated in the online events. Around 470 staff members took part in the in-person events offered at 15 locations.

For the Diversity and Inclusion team, which organized the first Diversity Week at Drees & Sommer, what is much more important than the facts alone is that the topic of diversity is now in the spotlight. The week raised the awareness of many Drees & Sommer staff members of diversity. It showed them the complexity of the issue, imparted information and gave a platform to staff members. In addition to the Diversity Week, many further measures have now been implemented as a new part of our diversity promotion. They include the setting up of a diversity and women's network, the integration of diversity-conscious language (and imagery) into internal and external communications, unconscious bias trainings, and the incorporation of our diversity statement BLUE IS BOUNDLESS into our mission statement.

By signing the **Charta der Vielfalt** (Diversity Charter) we have now also made a public commitment to create a diverse and respectful working environment for all employees.



Illustration based on Gardenswartz and Rowe: „4 Layers of Diversity“, www.charta-der-vielfalt.de

HEALTH AND WELLBEING

It is important to Drees & Sommer that employees feel physically well, are emotionally balanced and maintain social relationships. This strengthens their identification with their work and enables them to achieve a better work-life balance. To promote physical health, we offer preventive care programs. These include courses such as online yoga, special health weeks, a health bonus for sporting activities,

and offers such as a fitness subscription for sports facilities. For mental well-being, our employees have access to a free, external counseling program. This supports them with issues relating to body and mind, work and career, critical life situations, problems in the family, and finding childcare or care facilities. Offers such as part-time models, mobile working and educational leave round off the range of services.

IMPLEMENTATION OF OUR BENEFICIAL COMPANY STRATEGY

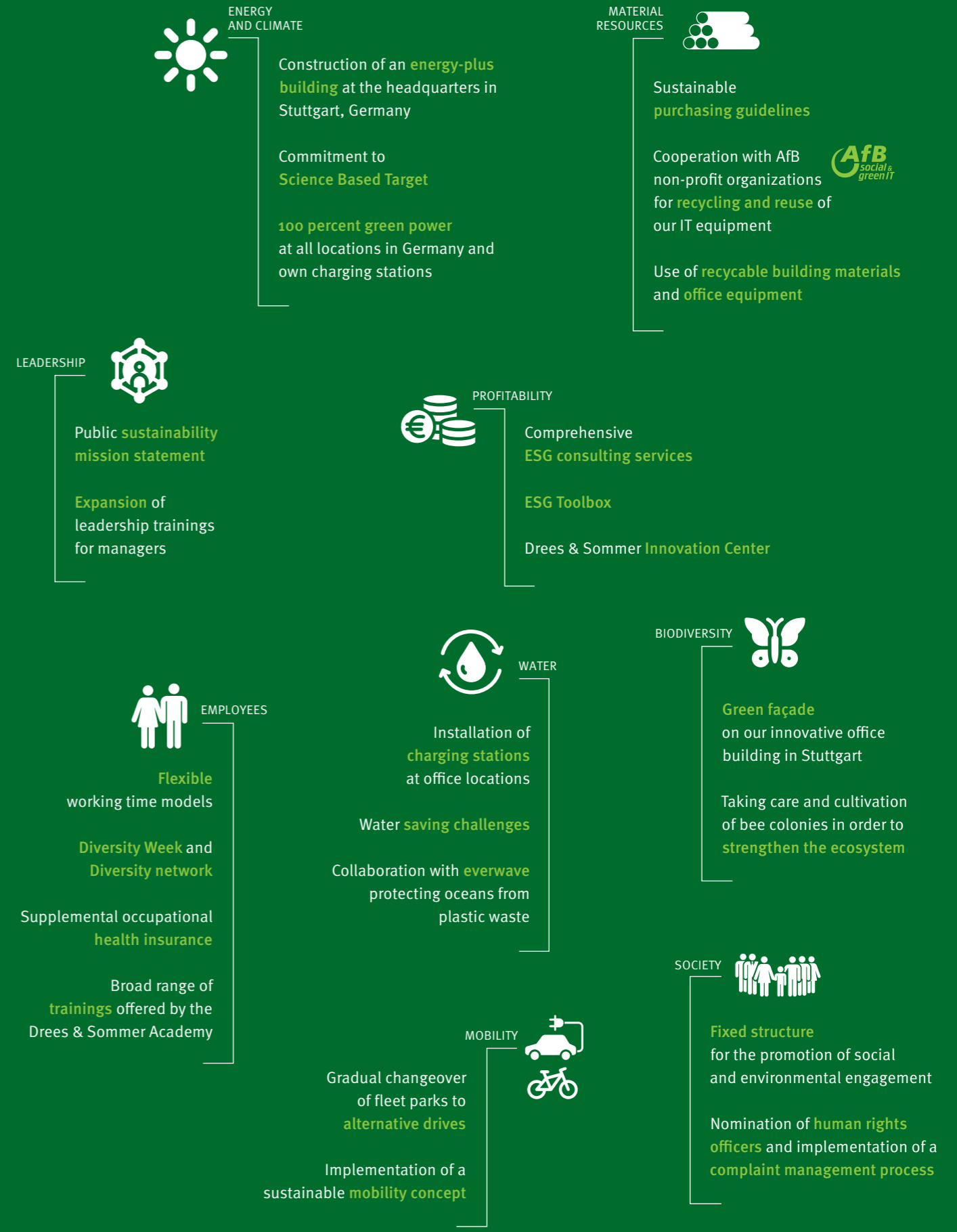
OUR MOST IMPORTANT FIELDS OF ACTION

Successful sustainability transformation of the economy will require the development of collaborative solutions and close communication between companies. Drees & Sommer is in regular communication with its stakeholders and takes their concerns into account in the company's business decisions.

Our beneficial company strategy is based on a materiality analysis carried out in 2021. We used an online survey to identify nine 'material' fields of action that are particularly important both from the point of view of the stakeholder groups and with regard to their impact on the environment, society and the economy. In all the fields of action, we set ourselves clear objectives as a company, which are addressed by means of an appropriate implementation strategy. In our annual sustainability report, we create transparency and provide information on the current implementation status of our sustainability targets.

| ESG | SPHERES OF ACTIVITY | IMPLEMENTATION STRATEGY |
|-------------|------------------------|--|
| ENVIRONMENT | 1. MATERIAL RESSOURCES | <ul style="list-style-type: none"> › Reduce quantity of waste and close nutrient cycles › Sustainable purchasing |
| | 2. ENERGY AND CLIMATE | <ul style="list-style-type: none"> › Compensation over and above offsetting unavoidable emissions › Science-based and comprehensible strategy development › Reduce energy consumption › Increase share of renewable energy › Active use of CO2 from the atmosphere |
| | 3. TRANSPORT | <ul style="list-style-type: none"> › Low-carbon commuting › Low-carbon business travel |
| | 4. WATER | <ul style="list-style-type: none"> › Reduce water consumption › Reduce volume of sewage into public network |
| | 5. BIODIVERSITY | <ul style="list-style-type: none"> › Increase biodiversity at Drees & Sommer locations |
| SOCIAL | 6. EMPLOYEES | <ul style="list-style-type: none"> › Diversity › Flexibility › Preventive healthcare › Further training and education |
| | 7. SOCIETY | <ul style="list-style-type: none"> › Social sustainability in the value chain › Implementation of social projects for community and environment › Engagement in social projects and strategically focused continuation › External service providers' compliance with collectively agreed and minimum wage laws |
| GOVERNANCE | 8. LEADERSHIP | <ul style="list-style-type: none"> › Responsible corporate governance › Honest and transparent communication › Increase visibility in the market |
| | 9. PROFITABILITY | <ul style="list-style-type: none"> › 100 percent of projects start with a digital strategy › 100 percent of projects start with a sustainability strategy › Sustainable innovations › Sustainable finance |

Targets, spheres of activity and strategic foundations of Drees & Sommer (clustered according to ESG criteria)



Examples of measures taken in the relevant fields of action.

MEMBERSHIPS AND AWARDS



Drees & Sommer's sustainability performance has been awarded Silver rating by EcoVadis.



Drees & Sommer has received the ESG Transformation Award for the sustainable transformation of its organization.

STAINABILITY REPORT 2022

Our sustainability reporting is based on the guidelines of the **Global Reporting Initiative (GRI)**. They have become established as an international standard and are constantly being developed. You can access the detailed version of our 2022 Sustainability Report using the QR code shown:



In 2023, Drees & Sommer signed the 'Charta der Vielfalt' (Diversity Charta) promoting diversity at work.



Drees & Sommer is part of the competence program of econsense – Forum Nachhaltige Entwicklung der Deutschen Wirtschaft e. V.

SUSTAINABILITY SOLUTIONS PART OF OUR BENEFICIAL COMPANY STRATEGY

As an energy and resource-intensive sector, the real estate industry has particular responsibility for achieving global climate targets. As a sustainability pioneer, Drees & Sommer established green building standards in the real estate industry at an early stage and developed integrated solutions for neighborhoods, towns and cities. Now the sustainability-specific consulting services also incorporate greentech solutions and sustainable industrial and financial products.

As a service company, we believe our greatest leverage in relation to environmental factors is in the project business. With the sustainability orientation of our service offering, we are taking an active part in the transformation of the real estate sector.

With our consulting mandates we support our clients in the implementation of sustainable project solutions. Our mandates include more than:

- 640 ENERGY AUDITS
- 20 ESG ROADMAPS / ESG STRATEGIES
- 2.700 GREEN DUE DILIGENCES / EU TAXONOMY CHECKS
- 475 GREEN BUILDING-CERTIFICATIONS
- 10 GREEN BOND CONSULTINGS
- 590 CRADLE TO CRADLE® CONSULTINGS (EPEA GMBH – PART OF DREES & SOMMER)

INDUSTRIAL PRODUCTS

- › **Circular Economy, EPEA**
C2C, product passports, etc.
- › **Integral factory planning**

INFRASTRUCTURE AND MOBILITY

- › **Mobility concepts**
Mobility certificates, e-charging infrastructure, etc.



SUSTAINABILITY IN OUR CLIENT PROJECTS

RECONSTRUCTION OF ESCHWEILER

Eschweiler, in the German federal state of North-Rhine Westphalia, was badly hit by the severe storms that caused huge devastation and loss of lives in July 2021. Drees & Sommer has been involved from the start in the reconstruction of the city.

A team of experts from Drees & Sommer started work shortly after the disaster. At an early stage we made the decision to return part of the fee to the city as a donation.

In this interview, Drees & Sommer staff members Frank Schnitzler, Carsten Schaadt and Annika Reiff, who were given charge of the project, talk about their tasks and the objectives of the project.

‘In all the subprojects we agreed with the client at an early stage that smart city approaches would be fundamentally integrated into the future-oriented reconstruction of the German city of Eschweiler.’

Frank Schnitzler,
Manager at Drees & Sommer

What was the situation in the city when the team started work here?

In the municipal area of Eschweiler the storms had caused the river Inde to swell to a raging torrent within the morning hours, resulting in unprecedented flooding in the center of the town. Many buildings were destroyed to the level of their upper stories. The streets were filled with mud, debris, trash and broken furniture.

Client: City of Eschweiler | Project duration: July 2021 – December 2023 | Key data: 39 municipal properties with around 90 individual performance and service tasks relating to construction, civil engineering, infrastructure, schools and sports facilities | Drees & Sommer services: project and multi-project management



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3, 11 and 13. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

What are the objectives of the city, as our client?

The city needed specialists to survey the damage first of all and prepare a review of the photos of the damage. The structuring of all the processes and planning tasks for the reconstruction then began. This enabled them to provide advice and support to the municipal construction department, the civil engineering department and the planning office, which were under a great deal of stress. We also prepared the application to the district administration for funding for the reconstruction, in close consultation with the finance department. The client also wanted the work to cover not only damage restoration, but also the introduction of innovations to infrastructure and development processes. This had to include aspects of sustainable building. The works – which are still ongoing – have been carried out under the guiding vision of a future-oriented reconstruction of the German city of Eschweiler.

What approach did Drees & Sommer take?

Our team inspected the damage closely and then decided what actions were needed and drew up a project objectives matrix for all the work. One focus was on damaged or destroyed schools, childcare facilities, sports facilities and residential care homes for senior citizens. We then worked with the city to set up a project organization and develop a multi-project management structure for the reconstruction. We were part of the steering group for the reconstruction appointed by the mayor and the special representative. A parallel objective was to provide a project office as a base for administration.

What value added can we offer the city?

The fact that we worked as an interdisciplinary team meant that we could develop appropriate solutions even when the tasks changed during the course of the project. The most important thing was not merely to follow the technical specifications defined in the contract, but to find solutions for problems relating to specific situations.

How is your relationship with the city administration?

Very close and trusting, it has to be said. We work really well together and, thanks to the staff members who come from the municipal and suburban areas, we have established a good connection with those at the highest administrative level as well as the rest of the staff.

What role do digital technologies play in the project?

In all the subprojects we agreed with the client at an early stage that smart city approaches would be fundamentally integrated into the future-oriented reconstruction of Eschweiler.

CLIMATE ROADMAP INDUSTRIA WOHNEN

‘INDUSTRIA WOHNEN is proactively tackling the challenges of the energy transition. It is a real trailblazer in the sector.’

Markus Claudy,
Senior Consultant
Energy and Sustainability

Existing buildings can contribute to climate change mitigation: specialists from Drees & Sommer developed a climate roadmap for two of the specialized institutional investment funds managed by INDUSTRIA WOHNEN GmbH. They also gave the client specific advice on matters such as protection of resources.

INDUSTRIA WOHNEN was looking for effective optimization proposals for aligning two specialized investment funds with international climate change mitigation targets. The client specifically wanted maximum transparency with regard to its organizational and technological options as well as the costs and returns. Apart from minimizing costs due to future increases in CO₂ prices, the main goal was to identify cost-effective renovation alternatives for the buildings portfolio.

Client: INDUSTRIA WOHNEN GmbH, Frankfurt am Main, Germany | **Project duration:** June 2022 – March 2023 | **Key date:** more than 18,600 residential units throughout Germany, gross floor area: 280,000 m² | **Drees & Sommer services:** climate roadmap, sustainability consulting



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 7, 11 and 13. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

The context: only a third of the building stock in Germany is residential. These buildings are responsible for 35 percent of energy consumption in the construction sector. Buildings dating from before 1979 account for two-thirds of the heating requirements of this property category. As a result, there is great potential for energy renovation in this segment.

Drees & Sommer made the client's portfolios more sustainable in a number of steps:

- 1. Determining the basics**
Determining basic constraints such as the choice of appropriate climate change mitigation tools and the trend in energy prices.
- 2. Analyzing the portfolio**
Establishing the current situation with different building designs (including listed buildings with protected status).
- 3. Working out appropriate actions**
Clusters of similar building types, ecological and commercial evaluation of efficient and effective modernization measures, such as insulation of the building shell.
- 4. Devising and optimizing individual measures**
Identifying suitable grant programs and renovation measures and ascertaining whether they can be shared out; conducting a sensitivity analysis based on different CO₂ price trends.

Drees & Sommer was able to draw up a targeted investment plan for the residential portfolios that enables the company to meet its climate change mitigation targets. INDUSTRIA WOHNEN ended up with a reliable CO₂ inventory for two specialized institutional investment funds and a thorough overview of the costs and returns, with the aim of making its buildings carbon-neutral by 2045.

The team's experience of similar projects was a big advantage. The open communication between the team and the client helped in finding the right answer to every question.

SPECIAL: ZERO CARBON

The Zero Carbon team of Drees & Sommer implements technologies and processes and combines them with the ecologic and economic targets of its clients. The aim is steadily to reduce the economy's and society's dependence on fossil fuel energy in the light of the EU climate targets. Here are our current projects:

H-TEC SYSTEMS – ELEKTROLYZERS MADE IN GERMANY FOR THE TRANSITION TO HYDROGEN

Regeneratively produced (green) hydrogen is the oil of the 21st century. It can store energy, be temporarily stored itself, and enable large container ships to sail the oceans without carbon emissions. However, there is still insufficient capacity to produce H₂ in large quantities.

Drees & Sommer has supported the hydrogen pioneer H-TEC SYSTEMS in one of the first projects: together with the parent company MAN Energy Solutions the company has chosen the Victoria Park in Hamburg as new production site for PEM electrolysis stacks. These are the core of the company's electrolyzers; via PEM electrolysis they transform water into the energy vector hydrogen.

Drees & Sommer is supporting the electrolyzer manufacturer with the conceptual design of a factory tailored to its needs, and creating state-of-the-art working environments for its employees. The construction project started in spring 2023, and the first PEM electrolysis stacks are due to come off the production line beginning of 2024.

SUSTAINABLE DISTANCE HEAT NETWORK OF GEOTHERMIE UNTERHACHING

The district heating system of Geothermie Unterhaching (GUH) is already serving a large part of the municipal area of the city of Unterhaching, Germany. In 2023 the expansion will accelerate in comparison with previous years. The aim is eventually to supply the entire municipal area with carbon-neutral energy.

In order to ensure that the project runs smoothly and to minimize the impact on members of the public, GUH engaged Drees & Sommer to draw up the construction schedule for the project. To do this, the experts examined the complex conditions on site and combined them with scheduling based on lean methodology.

STRAUBING – PLANNING OF GAS AND SEWAGE SLUDGE RAILS

Drees & Sommer is drawing up a plan for the Bavarian city of Straubing in collaboration with Sweco to expand the gas and sewage sludge rails at the sewage treatment plant there and operate them sustainably into the future.

The project involves the development of different implementation scenarios. These take into account technical and economic criteria and their purpose is to help the client to make decisions. At the same time Drees & Sommer is also developing efficient project management standards for Straubing's sewage treatment plant.

CARBON NEUTRAL ENERGY SUPPLY – ADMINISTRATION UNION THÜRINGER SPORTZENTRUM

The model project Carbon neutral energy supply for the winter sports center Oberhof focusses on climate friendly measures for the overall concept for heating, cooling and power supply.

The ways by which the project objective is achieved include the use of photovoltaics, biomass combined heat and power, and the recovery of waste heat from various refrigeration systems. The main focus here is on increasing the association's own contribution to the electricity produced. Drees & Sommer is providing a wide range of project management services, both for the overall energy strategy and for further work packages.

PRECISION AND FORESIGHT

The future is electric – and Mercedes-Benz is repositioning itself by restructuring multiple plants. Drees & Sommer has been concentrating on the challenging approach of Integrated Factory Planning.

In 2024, the automotive group will introduce new models in the compact and mid-size segment (A- to C-Class) using its MMA platform (Mercedes Modular Architecture). The MMA portfolio will include all-electric vehicles, but also mildly hybridized conventional gasoline engines, plug-in hybrids, and range extenders. One goal of the MMA platform is to respond even more flexibly to customer wishes. To this end, Mercedes-Benz is converting production at some plants – including in Rastatt, Kecskemét (Hungary) and Beijing – from vehicles with internal combustion engines to fully electric vehicles. Parallel production of the various model ranges with the different drive technologies is expected to continue for three years until mid 2027.

WHAT IS SO SPECIAL ABOUT THE PLANTS? WHAT IS SO SPECIAL ABOUT THE PLANTS?

Their adaptability. It is possible to produce internal combustion, electric and hybrid vehicles in one and the same plant. But this is a supreme discipline, because the drive trains differ greatly and this has an impact on the assembly sequences and, consequently, on plant engineering and material flow logistics.

Client: Mercedes-Benz AG, Location: Rastatt, Germany; Kecskemét, Hungary; Beijing, China |
 (General) planner: Drees & Sommer |
 Project duration: October 2021 – June 2027 |
 Drees & Sommer services: Integrated Factory Planning, General Planning of Conveyor Systems, General Planning of Buildings/GCM including Process-Related Facilities, Technical Implementation Engineering (TIE) with Implementation Coordination and Supplier Management and Start-up/
 Ramp-up Support, Technical Project Management, 3D Coordination/BIM Management, Overall Scheduling, Construction Management/ Site Supervision for all trades

WHAT WERE THE CONSEQUENCES OF THE SCHEDULE?

WHAT WERE THE CONSEQUENCES OF THE SCHEDULE?


Manufacturing MMA vehicles requires various changes to logistics processes in the plants: Preassembly areas have to be moved, new conveyor systems installed, and in some production halls overhead Heavy-EMS (Electrified Monorail System) have to replace the previous rigid C-hanger circuit in final assembly. These will be completely rebuilt to replace the rigid gradients with an integrated lift function in the suspension gear to improve ergonomics and increase flexibility in future production.

Comprehensive planning of the necessary measures and implementing them on schedule is a complex challenge, not least because conversion is only possible during production downtime. In addition, the core conversion at the Rastatt plant has to be completed within three months and create the conditions for achieving the targeted peak production volume within just four weeks.

The automotive experts at Drees & Sommer are taking on the ambitious task of harmonizing everything through far-sighted planning and coordination: This requires maintaining optimal conditions for the production both of the current model range during the conversion and of subsequent model ranges; complying with legal requirements such as fire protection regulations and building regulations, and undertaking the extensive reorganization required by the overall project. The customized methodologies and tools have been specially coordinated between Drees & Sommer and Mercedes-Benz. All project participants from Mercedes-Benz AG and Drees & Sommer, as well as external companies and equipment suppliers, use these tools to ensure maximum efficiency of project execution.

During execution of these various projects, Mercedes-Benz is not only benefitting from Drees & Sommer's expertise in construction, plant and equipment and process equipment planning, but is also getting a planning approach that, thanks to the holistic approach covering all plants and project phases, does not suffer from interface losses. The long-standing and trusting cooperation between the specialist departments of Mercedes-Benz AG and Drees & Sommer's Integrated Factory Planning team also made it possible to achieve noticeable savings, for example through layout optimization.

Thanks to modular planning and a lot of work on weekends and public holidays, we were able to get a lot of done on entire conveyor lines, giving us some breathing space before the three-month production halt.



70,000 m²
production
and logistics areas
cleared

Approx.
2.4 km
of conveyor
line
installed
in **8 weeks**



Approx.
110 km
of on-site
electrical and
telecommuni-
cations
cable routes
laid

2.5 weeks for dismantling process
plant and conveyor equipment – up
to 120 tonnes per day; a total of 2,400
tonnes dismantled and scrapped



HOW DID COOPERATION WITH MERCEDES-BENZ GO?

Like us, Mercedes-Benz wants to bring out the best in itself and its projects, and has a very modern, future-oriented way of thinking. This is reflected in the new model range. Our Integrated Factory Planning and the Mercedes-Benz mindset are a perfect match. We are proud to be contributing to the future of mobility in this way.

Client: Sadiyat Development and Investment Company (SDIC), Abu Dhabi, UAE | Project duration: March 2019 – December 2022 | Architecture: B+H Architects, UAE and Canada | Construction supervision consulting: Khatib & Alami (K&A) | Drees & Sommer services: Procurement, Design Management, Project Management, Agile Planning, Value Engineering, Technical Project Management, Cost, Time and Quality Control | Key data: GFA: 160,000 m², Construction cost: AED 1.57 billion



FROM SUNRISE TO SUNSET ON SAADIYAT ISLAND

The impressive 'Qaryat al Hidd' project covers 160,000 square meters of Saadiyat Island in Abu Dhabi. The two residential complexes 'Sunrise' and 'Sunset' offer residents stunning views over the water from twelve buildings with over 900 apartments.

Qaryat al Hidd (QAH) is a development on the 1.5 million square meter Saadiyat Island. The residential complexes are surrounded by resorts, restaurants, playgrounds, parks, shops, and a marina. Drees & Sommer worked with the companies Sharpoorji Pallonji Middle East, B+H Architects and Khatib & Alami to complete the QAH project.

Apartments range in size and type from one room to four. The nearby beach is the perfect place for residents to spend their leisure time, while lush green belts and attractive flower gardens provide a natural environment that complements the architecture. For entertainment there are several pools, gyms, a spa, various food and beverages outlets and retails.

"We are proud to contribute to such an iconic development in one of the emirate's most sought-after real estate areas."

Tobias Florian Heilig,
Senior Project Leader at Drees & Sommer
in Middle East

It was important to the client, Sadiyat Development and Investment Company (SDIC), that every aspect of the development was of the highest possible standard in order to do justice to the beauty of the island, while at the same time preserving the delicate ecosystem. Strict cost and schedule planning was a further challenge faced by Drees & Sommer. Previous disappointments with other service providers meant that SDIC had high expectations. By establishing an agile project management regime and conducting a series of workshops, the Drees & Sommer team was able to manage the project responsibly and in line with the client's expectations.



RELOCATION OF SECURITY CHECKS AT FRANKFURT AIRPORT

“Thanks to trusting cooperation with the client and our project execution expertise, we are able to handle the construction work together during ongoing airport operations.”

Meinolf Köster,
Team Leader at Drees & Sommer



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 9. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

The northward relocation of the security screening facilities currently involves seven projects, each comprising a number of measures and submeasures. For the Drees & Sommer team, this means coordinating a large number of project participants and interfaces. The trusting relationship between Fraport AG, Drees & Sommer and the two additional cooperation partners – Logo Infra Consult GmbH and Emproc GmbH – facilitates this cooperation considerably.

Drees & Sommer's team of experts also promotes digital, transparent and goal-oriented communication to ensure that the project runs smoothly. Past large-scale projects have shown that successful communication is a decisive factor for success. We are highly motivated and look forward to successfully completing the project at the end of 2027.

Every day, thousands of people travel through Frankfurt Airport – and with them, their baggage. And as they do that today, the security screening facilities for Terminal 1 are being moved north – without interrupting airport operations.

It's a challenge, but it can be done. Since September 2021, Fraport AG has been relocating the Terminal 1 security screening facilities at Frankfurt Airport. Drees & Sommer experts are managing the project on behalf of Fraport AG.

Drees & Sommer was awarded the contract in a tender process based on their project execution expertise. In addition to their in-depth knowledge and use of best practices, the client was also impressed by the price-performance ratio of their tender.

Client: Fraport AG, Frankfurt | Project duration: September 2021 – (approx.) end of 2027 | Architecture: B&V Architekten, Frankfurt | Drees & Sommer services: Project management based on AHO (Fee Structure Committee of the Associations and Chambers of Engineers and Architects), Book 9, Agile Methods – Lean Management





LIVING AND WORK ENVIRONMENT WITH SPECTACULAR VIEWS

An iconic building rises 40 meters into the sky above the water on the edge of Amsterdam's IJburg. The Sluishuis (sluice house) is one of the most striking residential projects in the city.

It features 442 energy-neutral apartments, as well as approximately 1.125 square meters of commercial and common space, 234 underground parking spaces, and moorings for about 30 houseboats. The special thing it is that, even though the building's footprint is a conventional rectangle, the building appears to be completely asymmetrical from any angle.

Drees & Sommer monitored quality compliance of the turnkey project on behalf of the institutional real estate investor Bouwinvest after its Residential Fund purchased 369 apartments in the complex – as well as all the commercial space and both levels of the parking garage – from the developers VORM and Besix RED right at the start of the project.



The extraordinary shape means the building takes on a different appearance depending on the observer's point of view.

“Sluishuis is a unique and iconic project that we were able to realize by respecting each other’s roles within the collaboration and inspiring each other with it.”

Marc Mattheijer,
Senior Project Manager at
Drees & Sommer in the Netherlands

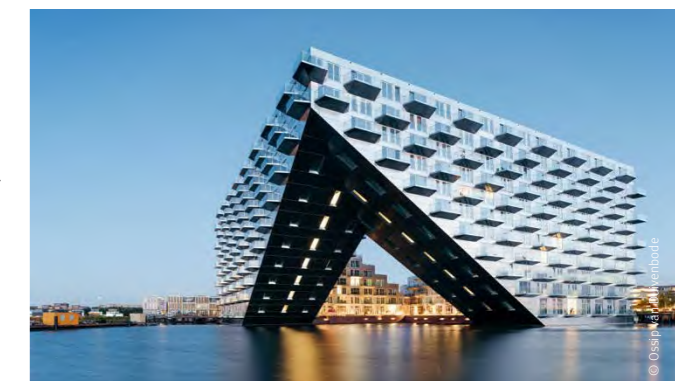
Bouwinvest’s quality standard was the criterion for selecting the combination of VORM and Besix as general contractors. This project was not based on following rigid specifications and drawings, but on meeting a requirements schedule. As work progressed, Drees & Sommer evaluated and discussed specific technical questions and change requests on behalf of the customer.

Assessments and any issues were regularly documented in detail as part of quality assurance. Together with periodic management reports on progress, quality and safety, this resulted in a dynamic, illustrated quality document covering all phases from the start of execution to the handover of keys.



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Bouwinvest Residential Fund | Project duration: April 2018 – June 2022 |
Architecture: Bjarke Ingels Group (BIG) and BARCODE Architects |
Drees & Sommer services: Construction management: Quality Supervision,
Customer Representation; Progress, Quality and Safety Monitoring |
Key data: GFA: 40,000 m2, floors: 10 (36 meters)



CHARGING POINTS FOR THE ENERGY TRANSITION

Local authorities must get fit for e-mobility. That's why the city of Wiesbaden worked with Drees & Sommer to develop a concept for the rollout of public charging infrastructure as part of the 'Clean Air Now' initiative. The company then collaborated with Fraunhofer IML to incorporate the findings into a roadmap.

A car glides quietly past – but the passengers' enjoyment of the smooth ride is all too often spoiled by range anxiety. Many drivers are only too familiar with the uneasy feeling of wondering whether the battery has enough charge for them to reach their destination.

E-mobility may be quiet compared to internal combustion engines, but the fact that the range of electric vehicles is generally relatively limited in comparison continues to inhibit the unavoidable transition to alternative drive technology. The solution is to roll out a dense network of charging stations.

Wiesbaden, the capital of the state of Hesse, is taking a step in the right direction. The city wants to promote cycling and walking, boost climate-friendly public transport, develop innovative concepts for inner-city logistics traffic and, last but not least, increase the proportion of EVs used for private transport.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 10 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: City of Wiesbaden, Civil Engineering and Surveying Office | **Project duration:** November 2021 – September 2022 (project stages 1 + 2, project stage 3 ongoing) | **Partner:** Fraunhofer Institute for Material Flow and Logistics (IML), Dortmund | **Drees & Sommer services:** Consulting on e-mobility and smart charging, including analysis of user groups and charging scenarios, needs assessment, technical concept for and conceptual design of public charging infrastructure, workshop sessions with stakeholders, preparation of tender documentation, invitation to tender and contract award consulting for charging infrastructure and e-mobility hubs, analysis and usage statistics, site search and inspection, profitability analysis, and consulting on construction and operator models | **Key data:** Charging infrastructure for up to 50,000 EVs with approx. 1,700 charging points

WHAT IS THE STATE OF MOBILITY IN WIESBADEN?

For this reason, a transition in the type of drives used for cars is a key element of Wiesbaden's comprehensive mobility transition. As part of an initiative subsidized by the German Federal Ministry for Economic Affairs and Climate Action, the city wants to set up public e-charging infrastructure as part of the 'E-Mobility Hub' research project. In November 2021, Drees & Sommer experts were commissioned to develop an implementation concept. The city council's stated goal is to provide simple and inexpensive charging for all EV owners.

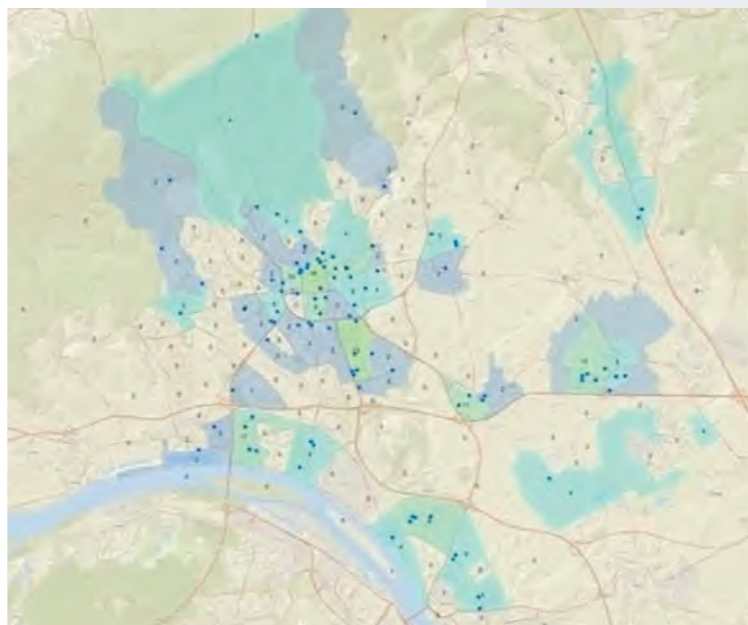
1,700 charging points by 2030

To establish a valid basis for planning, Drees & Sommer used various scenarios and forecasts to determine demand for public charging infrastructure within the city boundaries. The finding: Wiesbaden can expect to have around 50,000 electric cars by 2030 – around 35 percent of all car registrations. This means that some 1,700 public charging points will be required by 2030 – especially in inner-city areas, where hardly any private charging facilities are available.

Based on the needs assessment, the experts developed technical guidelines for the implementation of charging infrastructure and searched for suitable sites. In addition to detailed site planning, they also examined the economic viability of the project. Drees & Sommer is currently supporting the city with the contract award process and the rollout of the first e-mobility hubs.

WHAT IS THE STATE OF MOBILITY IN WIESBADEN?

Wiesbaden is one of a handful of major German cities that do not have a subway or tram network – public transport is provided by buses and express and regional trains. In 2021, there were 96.2 cars per 100 house-holds in Wiesbaden, in other words, almost one for each household. Traffic congestion in the city becomes particularly severe during rush hours. Up until 2019, Wiesbaden had exceeded thresholds for annual average nitrogen dioxide values on several occasions.



Wiesbaden's e-charging roadmap: The state capital Wiesbaden will install some 1,680 charging points by 2030 to ensure a basic level of availability.

WHERE WILL WE CHARGE OUR CARS IN THE FUTURE?

In addition to private charging points in residential buildings and company car parks, charging stations could be installed in public car parks and semi-public spaces such as supermarkets. Other scenarios in the Drees & Sommer study include hubs with fast-charging stations sited, for example, in public car parks or service stations in the urban area. Curbside charging points could also be installed on streetlight poles. The project's key finding is that the siting of charging hubs has to take transport destinations in each local area into account, as these are often transfer points and thus contribute to the use of intermodal transport.

It is important to strike a balance between charging points in public and semi-public spaces and private charging points, because if availability in one space increases, the demand for charging points in others decreases.

Close coordination of all stakeholders is recommended to avoid duplication of effort and infrastructure, and to achieve needs-based, cost-efficient rollout

throughout the entire urban area. All stakeholders were brought together in spring 2022 to participate in concept development. They included politicians, the city council and city power utility, housing construction specialists, employers, car park operators, and retailers. Ideas were exchanged in various formats including a kick-off event, planning workshops, a virtual geoportal, and a wrap-up event in September 2022.

Roadmap for cities and local authorities

Fraunhofer IML collated the findings from the dialog process and interviews in a roadmap, with Drees & Sommer contributing procedural and technical content from the implementation concept. The aim is to make it easier for local authorities to learn from each other – because there is still no standardized process for rolling out charging infrastructure. The added value is that local governments can gauge future demand for public charging infrastructure, allowing the development of reliable implementation concepts as the basis for long-term planning.

ATELIER GARDENS: FROM FILM CAMPUS TO CREATIVE OASIS

An oasis for filmmakers, other creatives and for social and ecological entrepreneurs is currently taking shape on a 100-year-old film studio site in Berlin. British real estate developer and investor Fabrix is sustainably transforming and upgrading the campus. Atelier Gardens has already won the 2023 MIPIM award for 'Best Urban Regeneration Project'.



Welcome to nature: Atelier Gardens attaches great importance to sustainability and is undergoing a radical greening strategy. One example is the approach to rainwater management. Parts of the original paving that sealed the area between the former film sound studio TON 1 and other buildings were removed and broken up. After being mixed with soil and landscaped, the old paving material now lines the outer walls of TON 1. Behind the building, under permeable lattice pavers, a large underground tank collects rainwater and supplies the toilet wing of TON 1. The campus is also home to fauna, with a beehive behind TON 3 and six hens and a rooster in a coop behind TON 1.





The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 6, 7, 9, 11 and 15. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Fabrix, London | Project duration: December 2020 – November 2024 | Architecture: MVRDV, Rotterdam in collaboration with Hirschmüller Schindele Architects, Berlin, and Harris Bugg Studio, Exeter | Drees & Sommer services: Project management, Construction Quality Assurance, Structural Engineering, Facade Planning, BSE Consulting, Technical and Economic Construction Consulting, Energy Consulting | Key data: Total area: 23,800 m²

Tatjana Hollweck enters the campus through the bright yellow entrance gate. As a civil engineer, she has been managing Drees & Sommer's Atelier Gardens project for just over two years. She works on site at least once a week to keep tabs on progress. She attends meetings and holds in-person discussions with those responsible for the Atelier Gardens project. "This is the construction site, HAUS 1" she says, pointing to the five-storey, scaffolded building to the left of the entrance. "The rooftop pavilion will be fitted with glass elements and clad from the outside," she explains.

"I really enjoy being involved in a huge project like this, with such high standards of creativity and future viability. I find working in an international team particularly enriching."

Tatjana Hollweck,
Senior Project Leader at Drees & Sommer

HAUS 1 plays a leading role in the new concept being implemented by British project developer and investor Fabrix on the legendary film studio site in Berlin-Tempelhof. By the summer of 2023, the scaffolding will have gone and the building will offer its new tenants – creatives, activists and other 'pioneers of change' – inspirational space for sustainable and future-oriented projects. A café on the ground floor will invite users to linger, while at the same time serving as the building's reception area. And, users will be able to take a huge yellow external stairway from the roof to the garden.

London-based real estate developer and investor Fabrix wanted to have a project manager on site who is well acquainted with Berlin and the German market. Drees & Sommer fitted the bill and impressed the client during the project. "Initially, we were only responsible for TON 1 and HAUS 1. Further contracts and subprojects were subsequently added – and since October 2022, we have been coordinating almost all of the project to transform the entire campus," explains Tatjana Hollweck. Other tasks undertaken by the Drees & Sommer team include structural engineering and facade design for HAUS 1, as well as the structural design for HAUS 6/7 and HAUS 12/13. "Whenever technical questions arise about BSE, we bring in our technical and economic construction colleagues," she adds. For example, the experts checked the energy efficiency of the heating system proposed by the general contractor.

The visualization shows how HAUS 1 will look without scaffolding and with a coat of warm yellow rendering.



The space in the former TON 1 can be used flexibly thanks to the ingenious system of rails and curtains.



The colorful curtains perform different functions. Acoustic curtains absorb sound, while transparent and opaque curtains allow different lighting moods to be created.

TON 1 is on the western perimeter of the campus. Built in the 1930s, the heritage-protected brick building was originally home to a film production studio. Following completion in May 2022, a new highly-technical curtain railing system allows flexible use of the space. TON 1 serves as a venue for concerts, exhibitions, conferences and parties. It marks the completion of the first major phase of works at Atelier Gardens and acts as a pilot for further work on campus.

Planning is currently underway for the remediation of Haus 6/7, which will be used as office, warehouse and workshop space. The final take for the Atelier Gardens regeneration project is a little way off still, with the entire campus to be remodelled by 2024. But with major phases already complete, and a growing community of impact-led tenants based on site, the vision is in large part already a reality.



TON 1 is a key part of the first face of substantial work at the Atelier Gardens campus. Since May 2022, the former film production studio has been used as an event space. It can accommodate up to 1,000 people for concerts, workshops, exhibitions or film screenings.



A FIRST IN GOLD

Client: Schaeffler China Co., Ltd., Taicang | Project duration: January 2019 – December 2022 |
Drees & Sommer services: DGNB certification consulting | Key data: GFA: 29.120 m²

Schaeffler has built a campus in Taicang, China for the production of electromobility parts. The Drees & Sommer office in Shanghai managed DGNB certification.

There are very few buildings in China with a German Sustainable Building Council (DGNB) certification. As a result, local architects and construction companies have little experience in this area. With the construction of its new factory building near Shanghai in the east of the People's Republic of China, the Schaeffler Group wanted to underpin its sustainability efforts for the first (and not the last) time with DGNB certification. The project was launched in 2019.

Decisive factors for the award of the consulting contract were the technical expertise and excellent reputation of Drees & Sommer as a founding member of DGNB in 2007. The initiative assesses the overall performance of buildings on the basis of clearly defined quality criteria in the areas ecology, economy, social culture and functionality, technology, process, and site. DGNB awards Bronze, Silver, Gold or Platinum certificates depending on the degree of compliance. Schaeffler initially aimed for Silver, but during the certification process the target was raised to Gold – without requiring any increase in budget.



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 9. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

“The challenge was to reduce project costs and still achieve DGNB Gold.”

Shuhao Zhang,
Senior Consultant and
Haiqing Guo,
International DGNB Consultant
at Drees & Sommer in China

Drees & Sommer's experienced Shanghai office used the Value Engineering method for the project, coordinating closely with DGNB headquarters in Germany, Schaeffler's project manager, the general contractor, and the construction team in China. For the customer, this had the positive effect of enabling optimization of some construction processes and meeting user requirements to an even greater extent. The Gold certificate was to be awarded within two months of the move-in in December 2022 – and this deadline was achieved.

The overall result is impressive. The campus demonstrates Schaeffler's commitment to environmental and social responsibility along the entire value chain in two respects. First indirectly, because the new factory produces parts for electromobility. And secondly, directly: In keeping with the spirit of the EU taxonomy, the campus impresses with various features, including its carbon footprint. According to calculations, emissions are expected to be around 4,500 tonnes below national energy savings targets for factories of this type.



The DGNB Gold Seal is visible proof of Schaeffler's commitment to ecological and social responsibility.





The project contributes to UN Sustainable Development Goal (SDG) 9. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

DUE DILIGENCE FOR AN INTERNATIONAL RETAIL PORTFOLIO

Immofinanz AG was interested in acquiring a retail portfolio comprising 23 retail parks in Poland, Slovakia, the Czech Republic and Hungary. For Drees & Sommer, this meant inspecting and assessing a total area of 128,000 square meters within a very short time. The client was able to use the information in the reports to negotiate a substantially reduced purchase price. The data collected also forms a sound basis for decisions on future investments in the portfolio.

Client: Immofinanz AG, Vienna | Project duration: July 2022 to September 2022 | Drees & Sommer services: Technical and Environmental (Phase 1) Purchase Due Diligence – with a focus on ESG (Environmental Social Governance) and EU Taxonomy compliance | Key data: Number of properties: 23, GFA: 128,000 m²



23

specialist retail parks in Poland, Slovakia, the Czech Republic and Hungary

128.000
m² total area



50
Drees & Sommer experts

KAI-UWE REISNER, SENIOR CONSULTANT, VIENNA

“As project leader, my job was to quickly establish an international team of in-house experts and work with them to complete the complex range of tasks in a very short time. It helped that I had already built trust with the client through a similar portfolio due diligence project in Romania in spring last year.

The biggest challenge was the extremely tight schedule right in the middle of the summer holiday season. We kept the teams lean, limiting them to two people per inspection. I also visited every single property myself – each time with a local colleague who supported me both with interpreting and local expertise. This allowed us to quickly convey a uniform picture and result to the customer. Brief daily reports after the on-site visits served as preliminary information. This was followed by a Red Flag report, and then a final report.

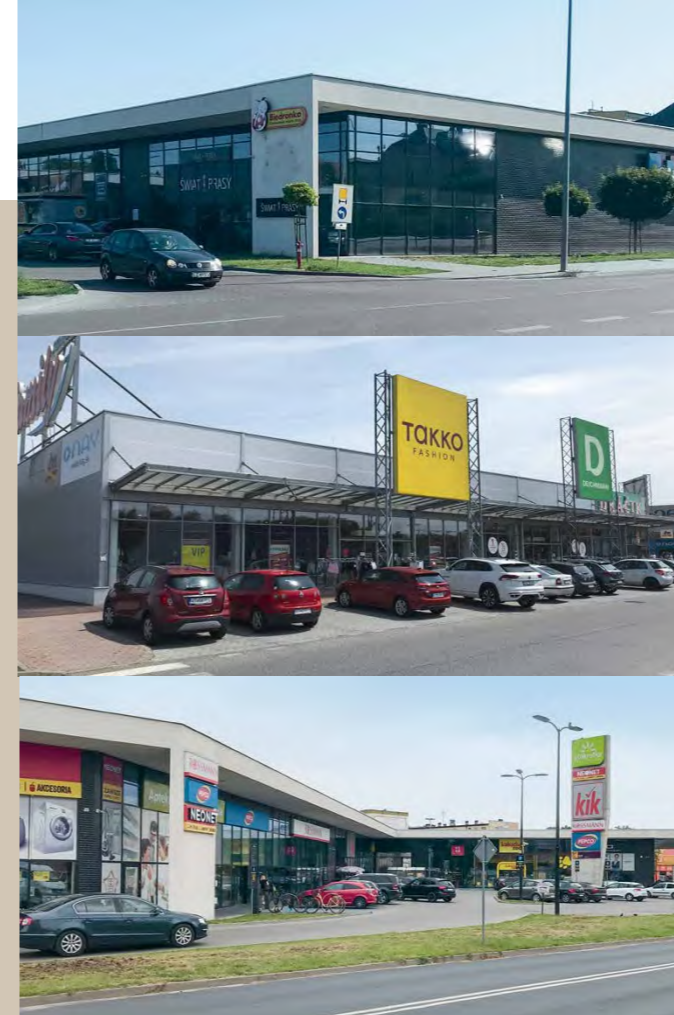
Portfolios of this size are relatively rare. The special reporting challenge was to make the different local, country-specific quality levels and conditions comparable. I would like to make special mention of the professional cooperation with colleagues from the various countries involved. It's great to see the commitment with which they approach their work.”

STEFAN FRÖMMEL, HEAD OF GROUP TRANSACTIONS AT IMMOFINANZ, VIENNA

“We urgently needed a professional partner to pave the way for our acquisition of a large retail park portfolio in four different countries (Czech Republic, Slovakia, Poland and Hungary). The challenge was to find a partner who was able to inspect a large number of sites at short notice and submit assessment reports on them. The way Drees & Sommer achieved this was impressive. Kudos!”

JOSEFINE MOCHAR, CONSULTANT, VIENNA

“I had international responsibility for supervision and quality control of issues concerning environmental and building regulations. It is really exciting to work on such a large project with so many different motivated colleagues, all with country-specific expertise. We had an intensive exchange of ideas and got to know each other really well. The experience I have gained from this is simply fantastic and unique.”



Inspect 23 specialist retail parks in four countries in just six weeks to assess their condition: Drees & Sommer put together a large, international team to undertake this task.

KATEŘINA ŠKVAŘILOVÁ, JUNIOR PROJECT MANAGER, PRAGUE

“This project was my very first at Drees & Sommer. I provided language support for the site inspections and organized the entire tour in Slovakia with 15 inspections in 13 different cities.

I also prepared the building regulations part of the report. This involved analyzing the land register entries, searching them for easements, and checking whether the permits were complete and compliant with the development plan.

The team members from all the different countries met in Vienna to bring all the threads together and produce the report – the close cooperation was fantastic.”

DÁNIEL JUHÁSZ, JUNIOR PROJECT MANAGER, BUDAPEST

“I was responsible for the ESG part of the reports on all sites. I also helped my colleagues during the on-site inspection of the two specialist retail parks in Hungary, and with information on local regulations. The aim was to obtain an overview of the buildings as accurate as possible, for example with regard to building regulations.

The whole project was quite challenging. I had previously participated in a technical due diligence for a portfolio, but in this project I had greater responsibility. I had to collect the information from inspections I did not attend myself, and then write the ESG part of the report on this basis. Specialist retail parks are not exactly among the ESG top performers in the real estate sector – so it is not easy to evaluate them from this point of view.

The time pressure was enormous, but with teamwork and a good work ethic, the team achieved the goal and performed well.”

ARTIFICIAL INTELLIGENCE MEETS SUSTAINABILITY

Experts in the fields of digital innovation and AI are greater demanded than ever – and having appropriate research facilities is one of the factors essential to promoting such talent.

Since the beginning of the new academic year, students in the Amsterdam Science Park have been looking forward to LAB42, a multipurpose university building for information, science and artificial intelligence (AI). The new building accommodates two research institutes that could no longer be accommodated in the main building due to the increasing number of students and new joint projects with industry. LAB42 features lecture halls, study and research rooms, as well as areas for collaboration with other disciplines at the university and with external partners in the field of AI.





Recycled building materials and minimal material use come together in the energy-neutral building.



The high sustainability standards are visible and tangible everywhere.

“From an early stage, sustainability was the starting point. During the selection process of the construction company, we assessed whether LAB42 met the university’s high quality and sustainability requirements.”

Rik Ter Haar, Senior Construction Manager,
Jeroen van Egmond and
Michel van Gageldonk, Project Managers
at Drees & Sommer in the Netherlands

A special feature of the project is that the University of Amsterdam – together with the city of Amsterdam and local industry – aimed to achieve a very high level of sustainability. Benthem Crouwel Architects designed an energy-neutral building characterized by minimized material usage, and the use of recycled building materials and materials with low embodied carbon.

From the preliminary design phase onwards, the Drees & Sommer experts were responsible for reviewing bids and monitoring the development of detailed planning. The Dutch colleagues supported the university throughout the entire construction period by acting as the main point of contact and managing construction. The university’s high standard in quality and sustainability always was one of the key factors in the monitoring, particularly in the areas of project and construction management. The on-schedule commissioning of the ‘Building of the Future’ in time for the 2022/2023 academic year is proof of how successfully these tasks were accomplished.

The building offers plenty of space for cross-disciplinary collaboration.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 4, 9 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: University of Amsterdam | Project duration: July 2019 to handover July 2022 |
Architecture: Benthem Crouwel Architects | Drees & Sommer services: Construction management and supervision, tender process consulting and support, construction cost management, contract management, project management, process management | Key data: GFA: 12,000 m²

RIGOROUS TRACKING PUTS THE PEDAL TO THE METAL

Client: Boehringer Ingelheim Pharma GmbH & Co. KG, RBB, Cologne | EPCM contractor: BakerHicks AG, Basel | Project duration: January 2017 – September 2023 | Drees & Sommer services: 360° Project Analysis, PMO Services | Key data: GFA: 34,500 m², Construction cost: €350m

“We can give the client requested information on any aspect of project status at any time. Our team is also providing the client with targeted support at the many project interfaces and developing suitable solutions for them.”

Ulrich Kaufmann,
Life sciences expert at Drees & Sommer

Initially, the fact that Drees & Sommer was joining an ongoing project posed a number of challenges. The team had to adapt the organization of the project and integrate the resulting changes into ongoing planning and construction operations.

It also soon became clear that there was a greater need for regular recording and greater visibility of project status. The team therefore implemented rigorous reporting and introduced digital tools, including a special Progress Tracking and Reporting Tool that compares planned and actual progress. This tool acts as an early warning system, allowing any emerging challenges to be identified and mitigated at an early stage.

Once again, an effective team combined with an established close relationship with the client proved to be success factors for the project, which is now entering the home straight.

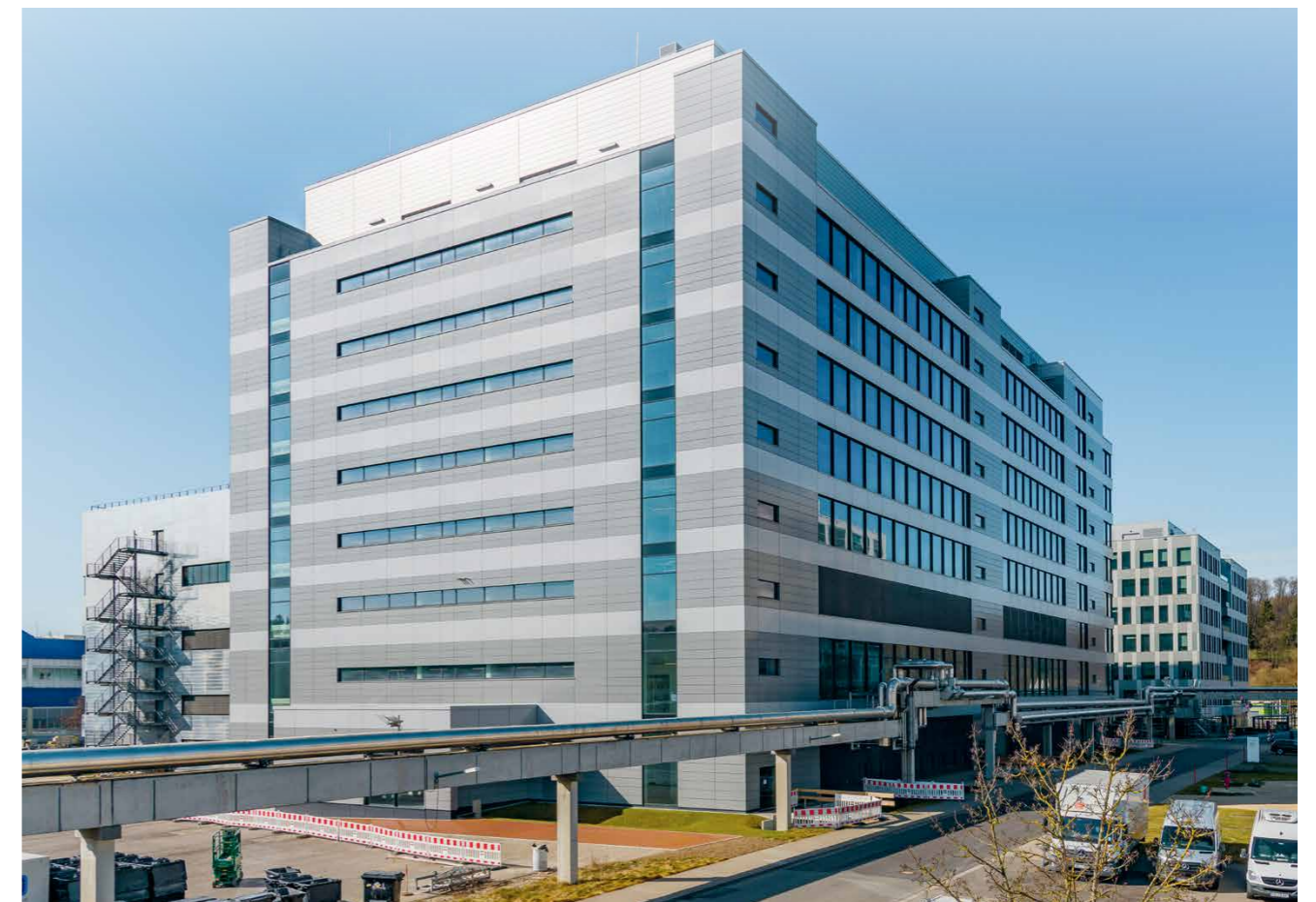
In April 2023, the research-driven company Boehringer Ingelheim opened a development center for biopharmaceutical drugs at its Biberach site. Drees & Sommer joined the ongoing project in 2020, and will continue to provide support beyond its completion.

The main focus of the project was on establishing development and control laboratories, production units, and a logistics area. The client asked Drees & Sommer to support overall project management through a Project Management Office (PMO) in order to achieve earlier completion of the project. In addition, the life sciences specialists were to stabilize planning and execution.

Based on a 360-degree project analysis, the team developed recommended courses of action and assisted with their implementation. Following rapid successes, Boehringer Ingelheim progressively commissioned a range of additional management services, including construction supervision, commissioning, qualification and pending issues management.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3 and 9. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>



SUCCESS FORMULA FOR ERGO: NEW WORK TIMES SEVEN

Monday to Friday. Nine to five. In the office the whole time: This work model is now considered outdated – at the latest since the COVID-19 pandemic. Employees are now demanding flexibility regarding where and how long they work, and many companies are complying. The ERGO Group embarked on an extensive project to address the topic of New Work and to make the transition to a sustainable work environment. Drees & Sommer supported the insurance group with its ‘Space’ subproject.

In May 2021, ERGO Group AG started rolling out mobile working and desk sharing at its seven largest administration sites in Germany. The aim was to increase employee satisfaction and cut costs by reducing office space. During the concept phase, the team first surveyed all user needs and analyzed the potential of the existing space. During the peak period, up to 60 Dresos were involved in the project, developing the New Work concept and comprehensive planning manual defining the new work environments. This included preparation of rough space allocation and furnishing plans for all seven sites.





The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3, 12 and 13. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

The concept included solutions for small-scale cubicle clusters as well as for open-plan offices of up to 5,000 square meters. The team primarily used existing furniture, supplementing it with lockers, special furniture and electric height-adjustable tables. Working closely with the ERGO Group's purchasing team, the Drees & Sommer experts assisted with the sometimes complex tendering and contract award process for the furniture. This required reconciling the Group's procurement guidelines with the specific requirements of the seven different locations.

Planning started at all locations in October 2021. The first of several relocation phases began in March 2022. The Drees & Sommer team was responsible for relocation management, including preparation and implementation. Relocation of the seventh and final office in Nuremberg will be completed in August 2023. Depending on the location, areas were combined to free up whole floors, parts of buildings, and even entire buildings. In addition to the seven administrative locations, the ERGO Group also redesigned and relocated around 30 sales offices between 2021 and 2023.

“We contributed our expertise in New Work, project management, facility management consulting, building physics and communication across locations and disciplines.”

Daniela Johanna Schulze,
Associate Partner at Drees & Sommer

The customer was able to count on Drees & Sommer's wide-ranging expertise for the project. Communication is a particularly important element of such projects. Regular core team meetings and weekly subproject team meetings with all seven site project managers ensure the smooth flow of information. Various codetermination bodies and representatives of severely disabled employees, as well as company medical officers and safety specialists, are also involved. Drees & Sommer was also the interface to other subprojects such as IT and Change Management. New Work is more than just mobile working and desk sharing: It also means adopting different mindset with regard to the new work environment.

A key success factor – even in times of increased mobile working – is an on-site presence. The fact that Drees & Sommer has regional offices at all seven major project locations facilitated close cooperation with the client. Thanks to the New Work concept, combined with the introduction of desk sharing, the ERGO Group was able to reduce the number of permanent office and project workstations from 19,000 to 12,000. This allowed the required office space to be reduced by 60,000 square meters.

Client: ERGO Group AG, Düsseldorf | Project duration: April 2021 – August 2023 |
Drees & Sommer services: Workplace Consulting, New Work Concept, Tendering and Contract Award for Furniture, Building Physics, Acoustics, Facility Management (Operations Manual), Relocation Management, Project Management | Key data: Office space: 234,000 m², total GFA 1,000,000 m²



Essential to a desksharing concept and to the detachment of fixed workstations is the provision of a personal locker for all employees.



Employees can select their desk daily via a desk-booking app to choose the appropriate work environment for the task at hand.



SETTING NEW STANDARDS FOR FLEXIBILITY AND SUSTAINABILITY

The district of Constance is merging the Zeppelin Vocational School and the Wessenberg Commercial School to form the new Constance Vocational Training Center. Drees & Sommer will support the project – a groundbreaking construction in ecological terms and an important development for the western Lake Constance educational region – until its completion in 2028.

Drees & Sommer's team for education buildings offers the client pooled expertise from a single source. But the challenges facing the team are huge: The Covid-19 pandemic and the war in Ukraine are still having an impact on planning and construction progress, as well as on the availability of skilled workers and materials.

But so far, the experts have always managed to work with the principal to find solutions to problems that have arisen. The decisive factor here was the fact that Drees & Sommer succeeded in reducing the complexity of the project and establishing structured processes, including a detailed concept for the individual construction phases. The team made a point of involving the future users of the buildings in the process, for example by organizing joint training sessions on usage and sustainability aspects, such as flexible use of the workshops for different types of teaching content.

The interior is characterized by timber, fair-faced concrete, floor-to-ceiling windows and open atriums, creating high spatial quality.





The corridors, which can be used flexibly and furnished as required, provide space for recreation and social interaction.



In future, students at both schools will be able to learn together in the workshop building, where the focus will be on vocational training.

Client: District of Constance, Office for Building Construction and Building Management, Constance | **Project duration:** July 2017 – December 2028 | **Architecture:** Franz und Sue ZT GmbH, Vienna | **Drees & Sommer services:** Feasibility study, assessment of the technical and structural condition of established buildings, architectural competition according to RPW (Guidelines for Planning Competitions), EU-wide selection of specialist planners, project control AHO, Project Communication System (PCS), workshop planning, sustainability consulting in line with state environmental criteria (NBBW), and the recommendations of the German Sustainable Building Council (DGNB), C2C, invitation to tender and contract award for construction services, review of model workshop, scrutiny of specification (above and beyond basic AHO service) | **Key data:** GFA: 28.000 m², Gross volume: 144.000 m³, Conference seating: 318, Refectory seating: 208

The spacious forecourt in front of the central entrance creates a high-amenity space for the entire campus.



The city of Constance will also be able to use the new three-field sports hall.

“The building’s concept allows the district of Constance to make an important contribution to strengthening vocational training in the region.”

Yvonne Allner,
Project Leader at Drees & Sommer

The deconstruction of existing buildings on the Zeppelin vocational school site will be synchronized with four dovetailed construction stages between 2022 and 2028. Top-quality new buildings with facilities for natural sciences, workshops, a refectory, an archive and a three-field sports hall will be built in stages. Sustainable concepts are being applied to the changing training landscape. These include, for example, flexible teaching and learning environments, quiet zones, and areas for collaborative learning. As a result, the new school buildings combine New Work and New Education approaches in exemplary fashion. New solutions open the way for modern educational approaches – for example the design of modular classrooms and corridors as quality common areas for encounter and recreation.

The company’s education experts are providing comprehensive support for the project. Drees & Sommer supervised the competition for building planning services based on the Guidelines for Planning Competitions (RPW) as well as additional planner selection processes based on the German Procurement Ordinance (VgV) and the Regulation on Subthreshold Procurement (UVgO). The team has also been commissioned to undertake project control and workshop design services, and to provide sustainability consulting.

The future vocational school center is also impressive from an energy point of view: It both meets the requirements of the NBBW (Baden-Württemberg Sustainable Construction) criteria and achieves DGNB Gold status after Drees & Sommer experts assisted with the certification process. Drees & Sommer has also integrated other elements of the Cradle to Cradle® approach to ensure the resource-efficient use of building materials.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 4, 6, 7, 11 and 13. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Shenzhen Kedali Industry Co., Ltd., Shenzhen (China) |
 Project duration: July 2020 – May 2022 |
 Drees & Sommer services: General Construction Management (GCM)

PRECISION FOR THE PROPULSION TRANSITION

Kedali Germany GmbH is opening a new plant for precision battery parts in Erfurt, which will make an important contribution to the transition to electric cars. Drees & Sommer provided comprehensive support to the Chinese company throughout the project.

“Two things were crucial to the success of the project: Firstly, our high level of engagement with the customer. And secondly, that we had all necessary competencies in-house. This allowed us to minimize interfaces while maximizing efficiency and quality.”

Di Miao-Weichtmann,
 Project Manager at Drees & Sommer

Kedali is headquartered in Shenzhen, China and manufactures precision components for lithium-ion batteries. The Chinese company has recently opened a new plant in Erfurt in the immediate vicinity of its customer.

The Drees & Sommer experts formed an integrated, intercultural team and supported Kedali by providing an extensive service package. This included comprehensive project management in three languages (German, Chinese and English), building planning, building services equipment engineering, structural engineering, fire protection concept, invitation to tender and contract award for construction services, and construction management.

The construction project started in August 2020 and – despite the COVID-19 pandemic – was successfully completed on schedule in spring 2022. Over the course of the project, Drees & Sommer provided the customer with a number of benefits: Continuous support throughout the project – from the feasibility study and planner tender through to handover of keys – ensured continuity and stability of personnel. This was particularly important while representing the client in the negotiation and contract award phase. In addition, digital processes and tools such as BIM Design and coordination, as well as LCM Digital, were used in a targeted manner.



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 9. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>





SOLUTIONS FOR A HOSPITAL LANDSCAPE IN STATE OF FLUX

The healthcare sector is booming, but is at the same time undergoing radical change. Four Drees & Sommer projects demonstrate how future challenges can be mastered both nationally and internationally – while creating added value for users and patients alike.

The new DHZC building
(German Heart Center of the Charité)
has a clear design language.

The Charité – Universitätsmedizin Berlin and the German Heart Center Berlin are pooling their expertise in cardiac medicine in the **German Heart Center of the Charité**. Accommodating more than 300 patients and boasting state-of-the-art operating theaters and cardiac catheterization laboratories, the new DHZC building will be built in the period 2023 to 2028. The aim is to establish a leading European cardiology unit meeting the highest standards of climate and environmental protection on the Virchow-Klinikum campus in the Berlin suburb of Wedding.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3 and 4. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Charité – Universitätsmedizin Berlin | Project duration: September 2021 – December 2028 | Architecture: wörner traxler richter planungsgesellschaft mbH, Frankfurt | Drees & Sommer services: Project Control and Construction Project Management, Development of Specifications for Construction Services, Contract Award Management, Construction Supervision for Building Construction and Building Services Equipment, Lean Construction Management during the Construction Phase, Virtual Coordination with Users in collaboration with Inspacion | Key data: GfA: 75,000 m²



Users can move freely in a virtual model of the space they have designed, interacting with each other and using different objects. This allows them to test their processes and check actual space requirements in advance.

“The planning of the new Charité Heart Center focuses on the connections between human health, the environment and climate protection.”

Heiko Rihm,
expert for hospital planning
and healthcare facilities
at Drees & Sommer

Drees & Sommer is supporting the project from planning and execution to operation by acting as project manager, coordinator for Building Information Modeling (BIM) and sustainability consultant in order to achieve the DGNB Gold certification requested by the client. BIM enables the planning and design of the rooms in this complex construction project to be tailored to future users even before the foundation stone for the new building has been laid.

Working with cooperation partner Inspacion, the Drees & Sommer healthcare specialists are also undertaking virtual coordination with users. This planning method allows future users to be effectively involved in the new building at an early stage by enabling walkthroughs in the digital 3D environment.



At Essen University Hospital, digital medicine is no longer just a future dream – and ‘virtual surgery’ is part of its toolkit.

Since 2015, **Essen University Hospital** has been transitioning to becoming a smart hospital. The Essen University Medical Center is now one of the top 20 most digitized hospitals in the world. More and more processes being digitized, and artificial intelligence (AI) is being increasingly introduced. This takes services such as diagnostics, therapy and care to a new level, for example through digital planning and performance of surgery for particularly challenging operations.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3 and 4. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

Client: Essen University Hospital | Project duration: July 2017 – April 2021 |
Drees & Sommer services: Project Control, Project Lead Function, Technical Consulting, Quality Assurance and Claim Management | Key data: Number of operating theatres: 8, GFA ENT (new annex to surgical building): 7,700 m²

“The future belongs to comprehensively digitized treatment and surgery. It not only improves patient care, but also the working conditions for doctors – even during their training.”

Prof. Dr. med. Stephan Lang,
Head of the Otolaryngology Department,
Essen University Hospital

Drees & Sommer provided intensive support to the hospital throughout this process. The services provided by the healthcare experts include project control, project lead function, technical consulting, quality assurance, and claim management. Collaboration with the innovation-oriented client allowed the latest developments such as imaging and surgical planning of a digitized operation in a simulated environment to be integrated into the ongoing project during construction.

A special feature of the facility is the establishment of the corneal replication laboratory with a high GMP purity class is established in the clinic. This facility is one of only two in Germany that treats patients suffering from retinoblastoma. For this reason, the lab also has an international supply contract. ‘Corneal Bank’ is the official name used by Essen University Hospital. And the next step in its development is already underway, with plans for the Essen Hospital to develop from a smart hospital to a green hospital in coming years. This is all the more necessary as the healthcare industry is also a major emitter of greenhouse gases. Here too, Drees & Sommer is supporting the customer by providing the know-how to integrate and implement more cost-efficient and reliable technologies into the planning process – technologies that will also have a smaller climate footprint.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3, 5, 8 and 16. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>



Like many other hospitals, the **Cantonal Hospital in Winterthur**, Switzerland was faced with the challenge of having to modernize its premises in a sustainable way: The ‘Didymos’ project sought a replacement for the hospital tower building, which dates back to the late 1960s. An elongated ward wing and an entrance wing were to be built instead. The main entrance also had to be relocated. The replacement building significantly increases the proportion of single rooms and provides additional floor space to meet increased demand.

The old ward block moved to the adjacent new building in February 2022. The Drees & Sommer healthcare team was responsible for relocation planning and ensuring on-schedule commissioning. Both medical and non-medical plant and equipment and consumables were moved. In total, around 500 workplaces and 250 beds were relocated.

During relocation planning, Drees & Sommer had to take into account that the move involved more than just material goods – particularly critical was the transfer of patients with varying levels of mobility and a range of medical conditions. For this reason, planning had to be designed to minimize any negative impact on patients and staff and guarantee the highest possible level of safety.

Smooth relocation to new premises: The new building is the Winterthur Cantonal Hospital’s response to growing patient numbers.

Client: Kantonsspital Winterthur |
Project duration: October 2019 – December 2022 |
Architecture: Rapp Architekten AG and Butscher Architekten AG, Basel | Drees & Sommer services: Migration Planning, Transfer of Inventory to New Buildings, Commissioning | Key data: Beds: 250, Workplaces 500, GFA: 61,000 m²



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 3. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>



“The project is a long-term one, and medical requirements will, of course, increase over time. Like other challenges, we are able to master this one thanks to our flexibility and close collaboration with the client.”

Tim Wottge,
Healthcare Specialist and Team Leader
at Drees & Sommer

As in Winterthur, the existing Centre Hospitalier de Luxembourg (CHL) will be replaced by a new, modern and innovative building, the **Nouveau Bâtiment Centre**. In 2014, the client decided to abandon its original plan to remodel the hospital during full operation, opting instead for a new building. The client’s goal was to concentrate all critical clinical activities – currently spread across several sites – in a single new modern building.

The challenges here lie in ensuring the smooth hospital operation during construction work, as the cramped site – in Luxembourg City – is in the immediate vicinity of the CHL and the Childrens’ and Maternity Hospital. This required optimal use of space and sophisticated construction logistics during the planning stage.

Drees & Sommer is currently assisting the principal with numerous project control services, BIM management consulting and Lean Management. An interdisciplinary team of experts is also working for the principal on the digital Project Communication System (PCS), risk management, and construction logistics. In the leadup to planning, the specialists also prepared operational and functional planning.

Client: Centre Hospitalier de Luxembourg |
Project duration: July 2015 – Completion of new building at the end of 2028 | Architecture: M3 Architectes, Luxembourg | Drees & Sommer services: Project Management, BIM Management Consulting, Lean Management Services | Key data: Number of operating theaters: 18 | GFA: 132,877 m²



At CHL's Nouveau Batiment Centre, optimal use of is immediately apparent in the lobby area of the hospital.

PERFECT CONDITIONS FOR GENERATION Z

The sustainable education center was built using modular timber construction. Apprentices and integrated degree program students at TRUMPF were involved in the planning.



At the heart of the hexagonal building is a large event space with an open stairway.

Client: TRUMPF Immobilien GmbH + Co. KG |
Project duration: March 2022 – May 2023 |
Architecture: Barkow Leibinger, Berlin |
Drees & Sommer services: Lean Design
Management, Lean Site Management, Planning
(cost group 400), Costing, Invitation to Tender and
Contract Award, Site Supervision (cost groups 200,
300 and 400) | Key data: Construction cost: €14,5m



Glass facades provide plenty of daylight and sweeping views.

The TRUMPF Education Center was built at the high-tech company's headquarters site in Ditzingen in the comparatively short period of 14 months. It is one of the most modern training facilities in the region. The vocational and continuing training education center features a large event space that can accommodate up to 400 people and a digitally networked production system. It also has seminar rooms and workshops, as well as areas for creative work and collaboration. In a small dedicated Smart Factory, trainees learn how to use key technologies and digital networking.

“Timber has a long tradition as a building material – and thanks to its eco-friendliness, it also has a great future in construction.”

Turan Cinkilic,
Project Team Leader at Drees & Sommer

The new TRUMPF Education Center was designed by the Berlin-based architectural firm Barkow Leibinger. The building meets the highest standards of representative, functional and sustainable architecture. Energy is largely provided by solar panels and the use of ambient heat, while glass facades provide plenty of daylight and sweeping views. The planners made use of renewable raw materials by opting for ecological timber construction.

As it does not have to be transported over long distances, regionally sourced timber is a particularly eco-friendly building material that has the added benefit of storing carbon. Another advantage is that it lends itself to prefabrication, making it the ideal choice for modular construction. Industrial prefabrication brings considerable time and cost benefits in the planning, production and assembly phases.

Drees & Sommer was responsible for a wide range of construction management services during the project. These included planning (cost group 400), costing, invitation to tender and contract award, and site supervision (cost groups 200, 300 and 400). All these services were provided by Drees & Sommer, minimizing coordination effort and risk. In addition, the Lean approach to setup and management was used for the entire planning, tendering and construction process. This allowed early detection of any issues, enabling countermeasures to be taken as required.

Last September saw a record number of trainees start their apprenticeships or dual study program at TRUMPF in Ditzingen. With the number of trainees set to grow even further this year, the TRUMPF Education Center offers the perfect conditions for the future.



The project makes a substantial contribution to UN Sustainable Development Goal (SDG) 4. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

INNOVATIVE WORK ENVIRONMENT FOR ENERGY SUPPLIER

2022 saw the completion of Germany's largest free-standing hybrid-timber building, the EDGE Südkreuz Berlin by Tchoban Voss Architekten, next to Berlin Südkreuz train station. The German headquarters of Vattenfall is in the larger of the two buildings. Drees & Sommer supported the energy supplier with tenant and relocation services.

Your eyes are drawn upwards as soon as you enter the building. A huge, light-filled atrium greets those entering the building, and flying stairway with wide treads and connecting bridges holds a promise: There is much to discover here. And working here is ... different!

And at the heart of it all, Vattenfall is a tenant in this new world of opportunities: The company occupies some 22,300 square meters of office space in this remarkable building. The reason for the relocation of around 1,600 employees was the decision to consolidate the various offices dotted around Berlin and, at the same time, introduce innovative forms of cooperation. At the same time, space requirements were to be reduced to cut energy consumption and costs.

The ground floor of the huge atrium features a company restaurant and is the heart of the building. Drees & Sommer supported the client with the commissioning, acceptance and handover process.

Open, functional and distinctive: The reception area is a company's calling card. At EDGE Südkreuz, Vattenfall shows how that can be achieved today.



© Vattenfall / Fotograf: Mark Suelten



A view onto the Skylounge on the 5th floor. This level can also be reached via a broad flying stairway.

Client: Vattenfall | **Architecture:** Tchoban Voss Architekten, Berlin | **Interior design:** de Winder Architekten, Berlin | **Project duration:** September 2018 – September 2022 | **Drees & Sommer services:** Fit-Gap Analysis, User Project Management, Tenant Management, Technical & Economic Construction Consulting (TECC), User Requirements and Change Management, Workplace Consulting | **Key data:** Leased area: Approx. 22,300 m², Carré Building, Employees: 1,600



At EXPO Real 2022, the EDGE Südkreuz was the first new construction project to achieve an overall compliance rating of 95.4 percent. It was awarded DGNB Platinum and is Germany's most sustainable building. The building complex was also awarded the DGNB Diamond Award for design quality.

“Sustainability, modernity and a New Work environment: The EDGE Südkreuz Berlin takes hybrid-timber construction in Germany to a totally new level.”

Ann-Kristin Runow,
Project Manager at Drees & Sommer

Drees & Sommer supported Vattenfall with a full-service package before and during the move. Using fit-gap analysis, the team first determined the spatial requirements, and then managed the entire relocation process as part of user project and tenant management. Additional services were also provided, including technical & economic construction consulting (TECC), user requirements and change management, and workplace consulting tailored to the client's needs.

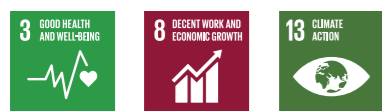
The Drees & Sommer team succeeded in ensuring that all project participants had a common understanding of the client's requirements. Drees & Sommer also systematically identified any strategic and operational gaps in the project process and structure and initiated necessary measures. The company was also able to identify interfaces and exploit synergies between this and a similar Vattenfall project in Hamburg.

The result can be admired – or even better, experienced – next to Berlin Südkreuz station.

Almost imperceptibly, the Skylounge merges into a recessed balcony. Drees & Sommer managed and coordinated the user subprojects, suppliers and service providers in this area.

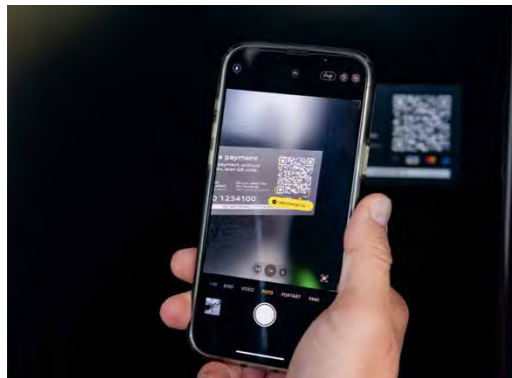


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The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3, 8 and 13. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

MAKING THE MOST OF CHARGING TIME



The Audi Charging Hub delivers peak charging performance, even during the busiest periods, thanks to its PowerCubes with buffer memory.

How nice would it be to have a little more time occasionally? Time to finally get back into the book you started, to let your mind wander, or kick back and enjoy a coffee in the sun – all without a guilty conscience?

Sounds almost like a mini vacation. But you could also make effective use of the extra time: Answer emails, plan your next vacation, or perhaps configure a new car. Or go for a test drive. But where would you be able to find this extra time in your busy schedule? Audi has the solution. The well-appointed Audi Charging Hubs allow users to make the best use of what would otherwise be wasted charging time.

Launched in Nuremberg, the pilot project will provide new fast-charging cubes in urban regions for a charging experience featuring convenience, exclusive offers and other attractive services.





Whether with or without a lounge area, customers can make the best use of their time here.

Users can swap e-bike batteries, rent e-scooters, get information about various Audi products – and even take test drives. And at some hubs, Audi even offers a just-in-time delivery service for groceries, vending machines with high-quality food and beverages, and car detailing.

As the response to the concept has been enthusiastic and the hubs meets customers' needs for an improved charging experience, new hubs were added in Zurich and Berlin last year. Hubs in Salzburg, Munich, Bremen and Frankfurt will follow this year.

The first prototype was built in Nuremberg at the beginning of the cooperation, but the first step was to develop a concept, including an execution strategy. So the Drees & Sommer experts worked on the project specifications with the Audi specialists in weekly coordination meetings, creating the basis for the general planner call to tender. And at the end of 2022, RPB Rückert GmbH was awarded the contract for general planning.

The experts also provided higher-level project management services, such as planning workshops, organizing project meetings, preparing monthly project status reports, updating schedules and cost plans, and auditing invoices and variations.

Drees & Sommer was commissioned to continue working on the project, which is now in the master planning stage. Even though the original schedule was briefly delayed, the high-quality of the general planning tender documentation ensured that the target dates for the preparation of master planning and the preparation of the general contractor call to tender can now be met. Planning of the hubs will commence in 2024.

Thanks to many years of successful cooperation between Audi and Drees & Sommer and our specialists' relevant expertise, the project is on track for success, with new locations constantly being added to turn charging time into time well spent. Audi charging hubs make a significant contribution to promoting e-mobility, while also focusing on people and their needs.



Quiet zone, workplace and workout area: The stylish ambience of the Audi charging hubs invites users to linger.

Client: Audi AG, Ingolstadt | Project duration: December 2021 – December 2022, with an option to expand scope and/or extend until December 2023 | Architecture: Designliga GmbH & Co. KG, Munich, and from December 2022 RPB Rückert GmbH, Munich | Drees & Sommer services: Project control services, preparation of the general planner call to tender



The focus here is on people and their needs.

“This is a special project that differs from the conventional construction we normally undertake for our long-standing customer Audi, and is one in which the entire team turns up to work every day eager to help shape the future of sustainable mobility.”

Veronika Linz,
Project Manager at Drees & Sommer



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 9 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>

The Audi charging hub in Nuremberg is the first of its kind in the world and serves as a prototype for all other locations.



Thanks to state-of-the-art photovoltaic technology, the zero carbon building M60 will become Germany's first climate-neutral office building of this size. It is one of three distinctive and innovative buildings in the new 'Die Macherei Berlin-Kreuzberg' district.

BIG PLANS IN BERLIN

Berlin magically attracts people with big plans and unusual ideas because they find inspiring places to develop and realize their ideas. The 'Die Macherei Berlin-Kreuzberg' district will be just such a place, as will the Pressehaus am Alexanderplatz. Drees & Sommer is supporting the successful execution of these innovative concepts by providing project controlling for investors and financing banks.





New Work in the timber-hybrid building M40: After completion in 2024, the building will offer users 27,800 square meters of space for offices, food and beverage and retail outlets.



The eight-storey timber-hybrid office and commercial building M40 was designed by ROBERTNEUN Architekten.



The 'Die Macherei Berlin-Kreuzberg' district is right next to the Möckernbrücke subway station. Around 66,500 m² of space is planned for commercial premises.

“Above the rooftops of Berlin: We are involved in the top high-rise projects, contributing our monitoring know-how to future-oriented refurbishment.”

Elisa Marx,
Senior Consultant at Drees & Sommer

WORK, CREATE, INSPIRE: That is the motto of **Die Macherei Berlin-Kreuzberg** at Hallesches Ufer 40 – 60. The district comprises three striking buildings: M40, an innovative new timber-hybrid building; the 90-meter Design Tower M50, an eco-friendly revitalization; and the completely climate-neutral zero carbon building M60.

The Drees & Sommer team took over financial monitoring of the 'Die Macherei Berlin-Kreuzberg' project more than two years ago. The experts are coordinating closely with the other parties involved to ensure that the project is completed as planned. These include the project developers and controllers from Art-Invest, as well as the financing banks.

Client: Financing banks | Project duration: February 2021 – 2024/2026 |
Architecture: ROBERTNEUN ARCHITEKTEN, Berlin for the timber-hybrid M40; EIKE BECKER Architekten, Berlin for the Design Tower M50; and Sauerbruch Hutton, Berlin for the zero carbon building M60 |
Drees & Sommer services: Financial monitoring | Key data: GFAs: M40: 27,800 m²; M50: 30,500 m², and M60: 8,200 m²

From West Berlin Postbank building to modern office tower: M60, the Design Tower is a model of eco-friendly revitalization and will offer flexible space concepts.





The 'Pressecafé', which dates back to 1973, was revitalized in a manner befitting a historic monument.



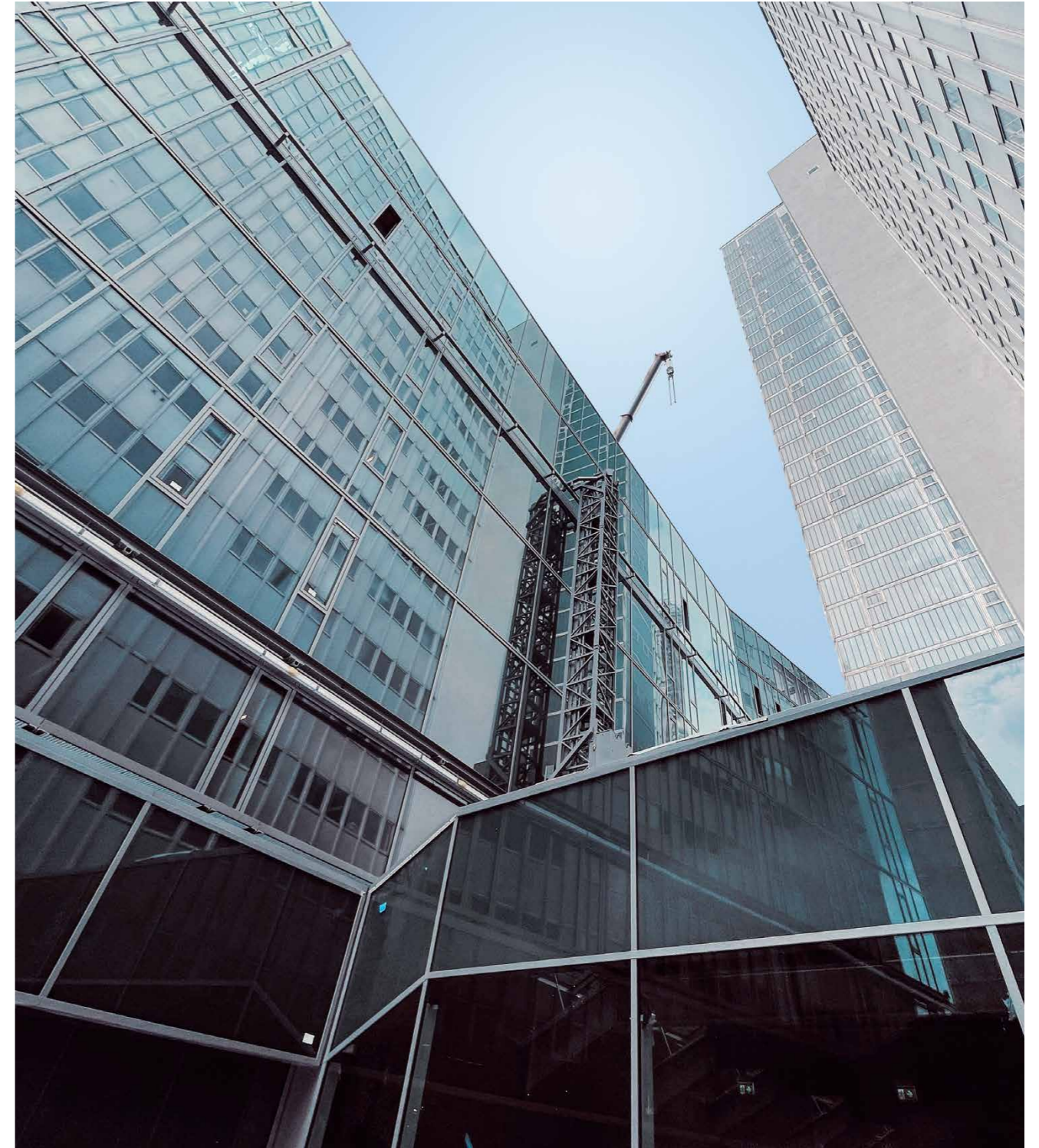
New Work above the roofs of Berlin: In the seven-storey new building, the New Podium, attractive office space has been created.

“In all our monitoring projects, we keep a close eye on the project triangle of cost, schedule and quality.”

Anja Höland,
Senior Consultant at Drees & Sommer

New Work is also a focus area in the **Pressehaus am Alexanderplatz**, which features attractive office and retail space. The complex comprises three buildings, two of which are heritage-protected: the 18-storey high-rise, built in 1970, and the two-storey Pressecafé on the southern side. A new seven-storey annex, the New Podium, is taking shape on the north-western side.

For more than four years, the Frankfurt-based investor GEG PAA has been relying on Drees & Sommer support with the remodeling and annex construction project. As a first step, the team performed technical due diligence on the 41,000 square meter project. The experts are also responsible for project monitoring and managing tenant fitout.



The renovation of the 'Pressehaus am Alexanderplatz' and construction of the annex are now on the home stretch.

LIVING ABOVE THE SUPERMARKET

It happens to everyone... You have just finished unpacking the shopping and you realize that you forgot to get something. No fresh yeast. Or toilet paper was not on the list. And that's really annoying when you live a long way from the nearest supermarket or if you have limited mobility.



Client: ALDI SÜD | **Project duration:** Ground-breaking ceremony November 2022, Completion 2024 | **Architecture:** lennermann krämer architekten | **Drees & Sommer services:** Project management, general contractor tender process and controlling | **Key data:** GFA: Approx. 8,700 m², Retail space: 1,000 m², Parking spaces: 64

But if you live right above the supermarket, you don't have that problem. And that will be the case for some residents of a new development in Pforzheim, Baden-Württemberg, where ALDI SÜD is building a flagship project in terms of urban development and shopping convenience. Apartments for seniors and a daycare center are taking shape above the retail space in an inner-city location.

The ALDI SÜD store will take up around 1,600 square meters of floor space on the ground floor of the building, of which around 1,000 square meters will be retail space. The total site area is 2,800 square meters. A parking level with 64 spaces is being built above the supermarket.

“The project will improve shopping for residents and complement the range of services for families with children, while at the same time creating attractive living space for seniors in an inner-city location.”

Holger Philippin,
Real Estate Director and the project
developer responsible at ALDI SÜD

A range of users under one roof

“In such construction projects, the different classes of use mean that both planning and construction are significantly more complex,” explains Jens Schmid, the project leader at Drees & Sommer who heads up the project management team. Additional service providers are needed, such as consultants for building physics, facade engineering, and fire protection. The Drees & Sommer experts ease the client's workload by handling coordination, managing the large number of project participants, and undertaking project controlling. At the start of the project they also ran the general contractor tender process on behalf of the client.

The L-shaped building above the parking garage and the supermarket accommodates a daycare center with four groups, 43 assisted-living apartments, and rooms for nursing staff. The L-shape creates a courtyard between the building and the adjacent buildings. Enclosed on three sides, it will be used as an outdoor area for the daycare center and a garden for the seniors. The groundbreaking ceremony took place in November 2022 and the building is scheduled for completion in 2024.

Win-win for multiple parties

For local residents, the mixed-use concept means everything is close by. Proximity is becoming increasingly important in view of our aging society and younger people's increased sensitivity to distance. Centrally located shopping is attractive if it is easily accessible using various mobility options or is somewhere you always pass by.



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 9 and 11. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>



A SHINING EXAMPLE OF NEW WORK

2023 got off to a very special start for the Drees & Sommer team in Frankfurt: We kicked off the year not only with renewed motivation and drive, but also in a brand-new office. Work has become faster-paced and more dynamic, especially over the last few years. So we are very pleased that we now have an office that not only reflects this new dynamism and flexibility, but actually promotes it.

Our multispace office – with a total area of 7,000 square meters on five levels – raises the bar for New Work standards. The project was planned and implemented by our in-house New Work experts.

Roof terraces, project rooms, outdoor workplaces – Drees & Sommer shows how all these can be realized
We emphasized the things that were particularly important to us. The result is ultramodern premises that leave nothing to be desired. If someone is looking for creative exchange and wants to brainstorm with their colleagues, they can find the ideal place to meet: The open-plan areas, creativity zones and project rooms guarantee meetings full of ideas. And flexible furnishings allow the spaces to be adapted to the size and needs of each group.



The Frankfurt-based Dresos have moved into premises that are a showcase for modern work environments: The multispace office with a total area of 7,000 square meters on five levels offers the perfect environment for every activity.



Conversely, people who need some quiet to focus on a topic have plenty of options, with quiet zones such as telephone booths and think tanks. There are no permanent workplaces here – and that’s a good thing. But there are personal lockers and dedicated storage areas for materials, ensuring that teams can work effectively with all the necessary tools and equipment at hand.

The open-air areas are a real highlight for the staff. The roof-top terrace on the sixth floor with its large awning has power and Wi-Fi, and can be used as a break and leisure area. Alternatively, it can function as a modern outdoor workplace just as soon as the first rays of sunshine break through the cloud cover over the Frankfurt skyline. And on the fourth floor, an outdoor meeting room has been fitted out for in-person meetings – a real game changer, especially on warm and humid summer days.

“Everyone has different needs, even in everyday working life. Our multispace concept does justice to that. Staff looking to discuss things can work in the open-plan areas – while people needing peace and quiet can withdraw to a focus room.”

Manuel Dorn,
Partner at Drees & Sommer’s
Frankfurt Rhine-Main regional office

An office that leaves nothing to be desired

And if someone needs to clear their head, they will soon be able to do this in the office’s own herb garden or at any time in the sports room. With basketball, table tennis and yoga on offer, there is something for everyone. People can switch off for a while – either alone or with colleagues – and then go back to work with renewed energy.

The Frankfurt regional office is an outstanding project that shows what New Work can look like in practice. In addition to taking our specific wishes into account, there was also a major focus on sustainability when planning the conversion of the premises. As a result, key elements of the fitout are Cradle to Cradle® certified and therefore recyclable. And what’s more, 80 percent of the furniture came from our former office.

The attractive location also provides additional added value: The Hafenpark quarter with its numerous restaurants is right outside the door – and excellent local public transport connectivity takes the hassle out of commuting. There are also charging points for e-vehicles and e-bikes in the underground car park to ensure sustainable mobility in the future.

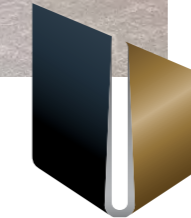
Client: Drees & Sommer | Project duration: January 2020 – December 2022 | Project developer: Lang & Cie. | Drees & Sommer services: Change Management, User Centric Consulting and Design, Move Management, Project Management, Mobility Concept, Wellbeing Analysis, Facility Management, General Planning, Energy Design, Building Physics, Customized Smart Building Consulting | Key data: 7,000 m² of multispace premises for around 500 employees



The project makes a substantial contribution to UN Sustainable Development Goals (SDG) 3, 9, 11 and 12. For an overview of the United Nations SDGs visit <https://sdgs.un.org/goals>



Community is the be-all and end-all – not only when working together, but also during breaks.



german
brand
award
'23
winner



Nice and cozy: There are plenty of quiet zones for people who need to focus.

A place of encounter:
Even the reception area is a perfect reflection of the communication-oriented design concept.



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Drees & Sommer operates internationally, and its clients benefit from its global presence. At 59 offices, our experts support both German and international companies from a range of industries in the realization of their projects. In addition, Drees & Sommer has temporary project offices all over the world – wherever you currently need us.

www.dreso.com/locations



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