



SUSTAINABILITY THROUGH INNOVATION



# The construction industry of the future

CREATING SUSTAINABLE REAL ESTATE  
WITH INNOVATIVE TECHNOLOGIES

The construction and real estate industry is facing major challenges in view of the lack of affordable housing, high costs of construction, materials and energy, as well as the shortage of skilled workers. In addition, climate change is one of the most urgent problems of our time. Agreements and concrete targets have been adopted worldwide. Germany has set itself the target of achieving net greenhouse gas neutrality by 2045. Although emissions have recently declined, the building sector is still responsible for around 30 percent of greenhouse gas emissions.

**ecobuilding AG** is consistently dedicated to sustainability and innovation in line with the principles of a circular economy. Our

goal is to enable the development of sustainable properties through an efficient combination of digitalised processes, serial prefabrication of components and individually designed energy management. With this approach we reduce CO<sub>2</sub> emissions by 80 percent in the construction and operation of our buildings.

We are committed to supply buildings and entire quarters with climate-neutral energy in the future by combining innovative technologies for the self-sufficient generation of renewable energy.

*The aim is to design, build, and operate new residential and commercial spaces to be as close to carbon-neutral as possible, while also creating sufficient affordable, functionally high-quality, and ecologically sustainable spaces for living and working.*



## Corporate management



**Ronald Pofalla**

Executive Board

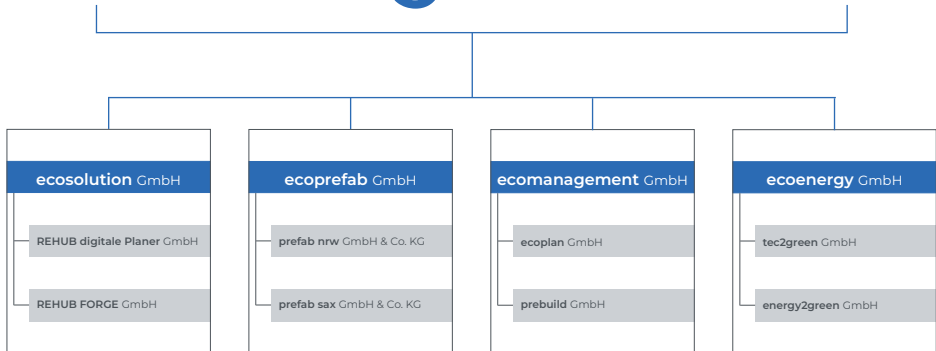
- More than 30 years of experience in management and politics with a focus on sustainability and green technology
- Head of the Federal Chancellery of Germany and Federal Minister for Special Affairs from 2009 to 2013
- Member of the Executive Board Deutsche Bahn 2015-2022 (including Chief Infrastructure Officer from 2017 to 2022)





**Ronald Pofalla** (Executive Board)

Prof. Christoph Ehrhardt (Chairman)  
Dr. Ulrich Metz (Deputy Chairman)  
Vera Gäde-Butzlaff  
Dr. Maysoun Zein Al Din



The **ecobuilding AG** is structured into four overarching divisions, each supported by specialised subsidiaries, enabling the development of sustainable real estate – from planning (ecosolution) to production (ecoprefab) and coordination (ecomanagement) to sustainable energy supply (ecoenergy).

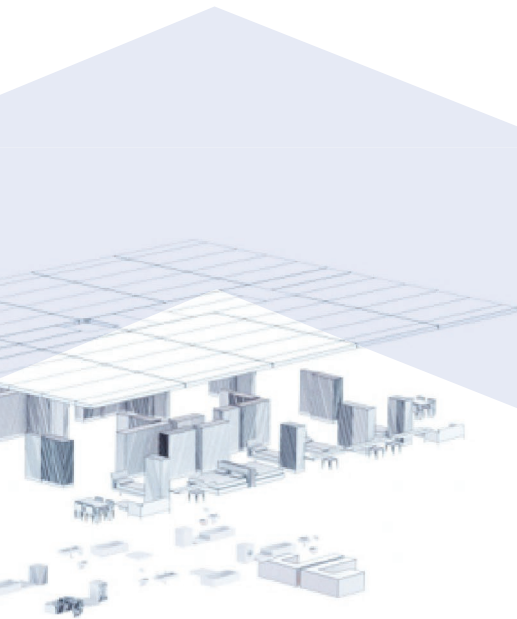
# ecosolution

## ARCHITECTURAL PLANNING IN NEW DIMENSIONS

Digital technologies form the necessary basis for a future-proof construction and real estate industry. This particularly applies to the circular economy that we are consistently striving for. ecosolution GmbH consists of the architecture start-up REHUB digitale Planer GmbH and the software start-up REHUB FORGE GmbH, both of which are driving forward the digital transformation of architectural planning in a profound and process-oriented manner with strong innovative and pioneering spirit and are experts in integrated planning using Building Information Modeling (BIM). By creating digital twins of the constructed reality, we generate precise data models and comprehensive building databases.

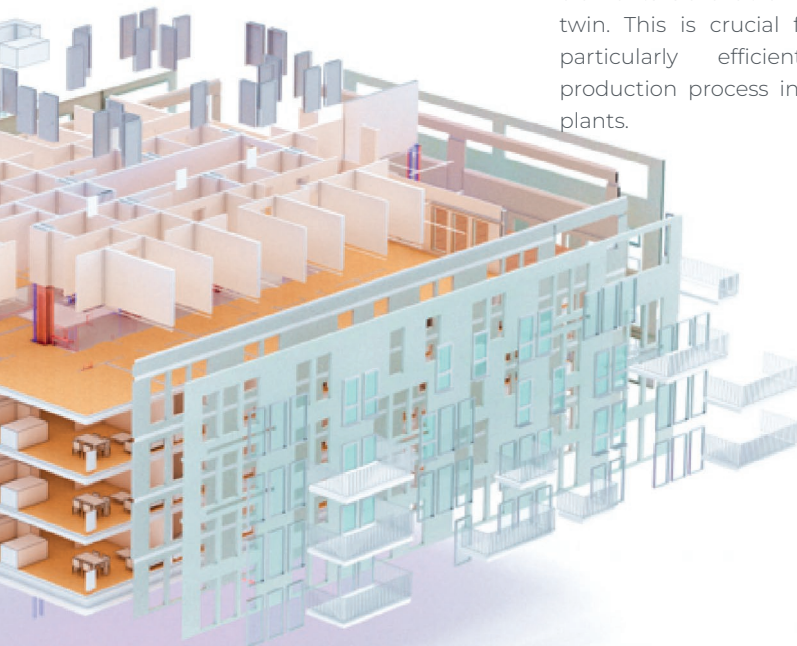
Direct and indirect emissions can also be determined using the data collected throughout the entire lifecycle of a building and, even decades after construction, it is still possible to trace where materials were used and in what quantities. Consequently BIM creates digital material passports, which can be accessed at any time. Until now, it has been impossible to determine which materials were actually used, especially in older buildings. Digital twins are therefore a prerequisite for treating existing buildings as a resource for materials, thereby enabling a circular economy. As well as classic, high-quality architectural planning, the REHUB team is dedicated to the digitalisation of planning





processes and methods in order to ultimately automate these using artificial intelligence (AI).

As a further important step, the REHUB team is currently developing “BIM for Prefabrication” models to ensure that the digital production chain suffers no loss of data in our future prefab plants. The advantage of these BIM models is that they no longer demonstrate any differences between the execution model (“as planned”) and the operator model (“as built”). As a result, a BIM model of the actual executed condition of the precast elements is available – almost like a digital twin. This is crucial for guaranteeing a particularly efficient and smooth production process in our prefabrication plants.



# ecoprefab

## MORE EFFICIENCY WITH SERIAL PREFABRICATION

The second pillar of **ecobuilding AG** is **ecoprefab GmbH**, under which the two companies **prefab nrw GmbH & Co. KG** and **prefab sax GmbH & Co. KG** for our planned precast plants are located under the label **EMC II**.

EMC II stands for the development of a state-of-the-art, innovative platform for the delivery of ready-to-install construction elements for shell and finishing trades. Prefabrication, meaning is the serial production of components, is efficiently linked with Building Information Modeling (BIM): The entire production process in the plants – from planning to execution – is digitally controlled. As the manual operation of interfaces is no longer necessary, the time and resource requirements are significantly reduced – an important step towards a sustainable construction industry.

*The CO<sub>2</sub> savings are around 50 percent.*







With a prefabrication level of 60%, our EMC II plants will be able to produce ceilings and walls with windows, insulation and empty pipes as well as balconies, stairs, columns and pillars on an industrial scale in the future. The shell components will then be transported to the construction site and assembled there.

The efficient combination of BIM and prefabrication makes construction at least 10 percent cheaper than conventional methods and only takes half the time. The ecological benefits are also considerable: Direct digital management and control make planning processes more transparent and material consumption can be optimised more easily, avoiding overproduction, incorrect deliveries to the construction site and unnecessary waste. The reduced need for concrete and reinforcing steel also significantly lowers the CO<sub>2</sub> emissions typically associated with their production. Additionally, there are increasing efforts to use recycled concrete, further decreasing emissions.

## Optimal integration, self-sufficient supply

When selecting locations for our prefabrication plants, it is important that they are close to urban centers and metropolitan areas with high levels of construction activity, as well as having good infrastructure and local connections. The plant we are planning in Nörvenich, North Rhine-Westphalia, is logistically located at an ideal hub between the Benelux countries and the German metropolitan areas on the Rhine and Ruhr. The factory design of EMC II is modular and adaptable to a wide variety of topographies. In order to reach the eastern parts of the country easily, we are considering an additional location in Saxony.

The electricity required for production will largely be generated by rooftop photovoltaic systems at the factory itself. The plan is to generate as much solar energy over the course of the year as is required for the prefabrication process. At the plant in Nörvenich, the surplus electricity is fed into the grid or converted into self-produced green hydrogen through electrolysis. In addition, the green hydrogen from the plant can be used to enable emission-free mobility on site.





# ecomangement

FOR SMOOTH WORKFLOWS IN THE  
DEVELOPMENT PROCESS

ecomangement GmbH acts as an interface between the other three corporate pillars of ecobuilding AG. As such, it organises, coordinates and monitors all processes within our construction projects to ensure smooth processes. It also provides consultancy and all related services. To this end, two new subsidiaries were founded: ecoplan GmbH is responsible for the digital planning that can steer the prefab plants. prebuild GmbH is dedicated to the construction-site assembly of the prefabricated parts produced in advance in the plants.



The technologies used include photovoltaics, geothermal energy, groundwater heat pumps, wastewater heat exchangers, hydrogen cogeneration plants and many more. The charging infrastructure for e-mobility is also integrated into the energy concepts.



# ecoenergy

## INTELLIGENT COMBINATION OF INNOVATIVE TECHNOLOGIES

Our goal is to enable a virtually climate-neutral energy supply for real estate projects and municipalities using innovative and proven technologies with renewable energies. Optimally combined and interconnected, these technologies can utilise substantial amounts of available environmental energy on site and store it for periods of low energy yield. To this end, our experts at ecoenergy GmbH analyse and develop fully customised solutions tailored to the local conditions.

The accumulated technical expertise is the foundation for a sustainable energy design that meets the requirements of supply security, comfort and genuine climate protection.

With the help of green environmental energies, we can significantly reduce CO<sub>2</sub> emissions in our quarters – right up to a climate-positive balance, meaning more greenhouse gases are avoided in the heating and/or cooling supply of the buildings than are caused. The surplus green electricity can then be made available to third parties.

# Future cooperation

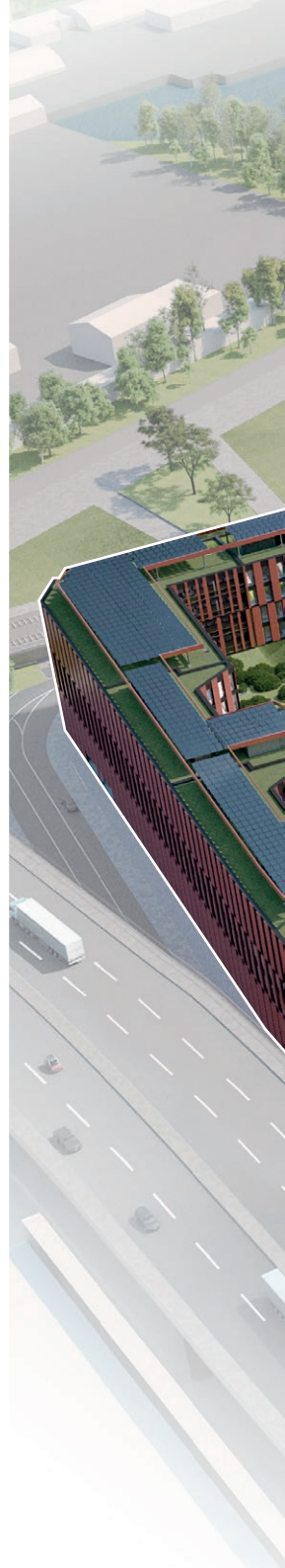
IN COLOGNE WE CREATE COLOGNEO CAMPUS  
TOGETHER WITH THE RHEINENERGIE



In cooperation with the nationwide energy supplier RheinEnergie AG, we are developing our quarter Cologneo Campus in Cologne-Mülheim, which is a flagship project in terms of electrification in the heating and cooling supply. By combining ground source heat pumps, district heating and locally generated green energy, we want to implement an innovative and sustainable energy concept that is carbon neutral on site.

Centerpiece are decentralized ground source heat pumps, which use environmental energy like thermal energy and air. The same heat pumps are used in wintertime for heating and in summertime for cooling. Not only saves this cost of investment and therefore results in lower end consumer prices, but also ensures a regeneration period for the ground probes. The ground probes revoke the warmth of the earth in winter for heating, which will be returned in summer through the cooling system. This circuit system is supported through the connection to the district heating network of the RheinEnergie.

The electricity for the system of ground source heat pumps will be mainly derive from on-roof and building-integrated photovoltaic system with a total energy performance of 565 kilowattpeak. Altogether the cooperation partners are thus very efficiently combining decentralisation, decarbonisation and electrification in the heating and cooling supply.





# COLOGNEO CAMPUS



# Cologneo Campus

## INFORMATION

Area: Cologne-Mülheim  
Object Type: Quarter  
Completion: around 2026  
Rentable area: approx. 32,100 m<sup>2</sup>  
(commercial)

Units Parking  
spaces/electrified: 377 / 65

Non-binding visualization

Park- und Bürohaus West – Cologneo Campus, Cologne



## ECO-FACTS

Heating and cooling supply

### 447

Tons of CO<sub>2</sub> saved per year, e.g. through geothermal energy, air-to-water heat pumps and photovoltaics

### 79%

CO<sub>2</sub>-reduction through sustainable technologies on the site

## Climate positive

through the additional purchase of green electricity and green district heating

**447 tons of CO<sub>2</sub> correspond to:**



the annual CO<sub>2</sub> sequestration of  
**35,776 beech trees**



**~35 trips**  
around the world by car



**3,434 economy flights**  
from Munich to Berlin





Non-binding visualization  
Bürohaus Nord (MIS) – Cologneo Campus, Cologne

We intend to cooperate with RheinEnergie AG on further projects throughout Germany (stated in a Memorandum of Understanding – MoU). Together we aim to analyze and evaluate all ecobuilding-quarters – for example our GREENVILLE in Karlsruhe to engineer individual and innovative strategies for sustainable energy supply.



**Disclaimer:** This publication is for informational purposes only.

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### **Legal information**

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ecobuilding AG  
Wilmerdorfer Strasse 39  
10627 Berlin  
T +49 30 7675948 1100  
F +49 30 7675948 4999  
E [info@ecobuilding.ag](mailto:info@ecobuilding.ag)

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