Environment

Environment and Climate

GRI 103-1, 103-2, 103-3, 305-4, 305-5
UNGC Principle 7, Principle 8, Principle 9
SASB IF-RE-130a.1

Disclosure

In July 2021, several regions near the Ahr and Erft rivers were struck by a once-in-a-century flood due in part to the heaviest rainfall since records began. The striking images of the devastation that the event caused in Germany and Belgium made it abundantly clear that climate change is no longer just an abstract scientific problem. The impact of climate change is only going to become more significant, and we are not going to be immune to its effects in this part of the world.

The events in the summer of 2021 provided yet more evidence that limiting global warming and protecting the natural resources required for life on earth are one of the most important challenges facing us as a society. That is why environmental and climate protection have such an important role to play in our sustainability strategy. We support targets set at an international level, such as the 1.5°C target set out in the Paris Agreement and the European Union Green Deal, as well as the goal set by the German Federal Government in 2021 to achieve climate neutrality by 2045. The Austrian government is going even further, and wants to be climate neutral by 2040. The world of business has an active role to play in achieving this target. It can also drive the research and development that will be needed in order to reach global climate targets. The real estate sector has an important part to play in this because the construction and operation of buildings emit a significant amount of the greenhouse gases that cause climate change. As the housing industry market leader in Europe, we aim to be a central driving force behind climate protection. With a portfolio of 413,967 residential units (excl. Deutsche Wohnen) in Germany, Austria and Sweden and its involvement in a number of wide-ranging development activities, Vonovia has a significant role to play in protecting our environment and mitigating climate change.

HIGHLIGHTS 2021

> Climate path for the existing German portfolio updated: virtually climate-neutral building portfolio by 2045 set as target (<25 kg CO_2e/m^2 by 2030)

> Carbon intensity in Germany improved by 2.8% to 38.4 kg CO_2e/m^2

> 2.3% refurbishment rate achieved in Germany

> Decarbonization tool for implementing environmental targets on regional and neighborhood levels. Neighborhood approach also a focal point of climate protection

> Serial refurbishment in line with Energiesprong principle piloted

> 1,000th roof fitted with photovoltaic system. New target set for expansion: installation of PV systems of >200 MWp on 17,000 roofs

> BUWOG in Austria becomes partner in "klimaaktiv Pakt2030" with the goal of reducing emissions by 55% by 2030 against the base year of 2005

A decentralized energy transition is vital in order for the climate action plan being taken by governments and companies to be successful. Residential real estate companies can make an important contribution in this area while also opening up new business areas for themselves. Their properties offer great potential for generating renewable energies, e.g., by using photovoltaic or solar thermal installations on roofs. This provides the basis for innovative schemes like landlord-to-tenant electricity models – prospectively also for heat pumps and charging infrastructure. This approach puts Vonovia in a position to make use of the opportunities that will arise as a result of our increasing demand for renewable energy and the transformation underway in the transport and energy sectors. We also believe that there is significant potential for Vonovia to drive innovation within the residential property sector while remaining at the forefront of the energy revolution and achieving our own climate targets. Of course, we need a suitable statutory and technological framework in order for this to be successful.

Climate action and protecting the environment are becoming increasingly relevant topics in wider society. As a listed company, our activities and transparency in the area of climate change mitigation reflect the increasing importance of this topic for our customers and shareholders. They are also a response to changes in the regulatory requirements that affect how we do business. The growing demand for sustainable investments and the Sustainable Finance action plan set out by the EU Commission have the potential to transform our financial markets, as do the EU Taxonomy for sustainable activities and the TCFD framework (see → **Implementation of the Recommendations Made by the Task Force on Climate-related Financial Disclosures (TCFD)**).

The steps that will be required in order to reach the targets of the Paris Agreement and the European Union Green Deal will also be of importance for Vonovia. The extent of the impact that we have on the environment is dependent on how we choose to go about building new residential units and managing our existing portfolio. The same is true for the choices that we make about the ecological environment of our buildings. Maintaining and improving biodiversity in our residential environments is one positive step that we can take in order to protect the environment. We are also committed to conserving resources and contributing to the circular economy whenever possible.

The topics discussed in this section provide the framework for our activities, and are assigned to the two material topics that come under the area of Environment and Climate: Reducing CO_2 in the Real Estate Portfolio/Energy-efficient Modernization and Renewable Energies and Energy Mix. The other important topics in this section are Biodiversity, Water, Waste and Effluents and Energy Efficiency and Carbon Reductions in Operations. The important topic of Innovations for Climate and Environment is a central theme that is primarily presented under the material topics.

Implementation of the Recommendations Made by the Task Force on Climate-related Financial Disclosures (TCFD)

GRI 102-15, 201-2

We began the process of integrating sustainability risks into the company's risk management system in 2020. In this context, we have incorporated the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) into our reporting process in order to shed special light on the climate-related risks of our business. Implementing the recommendations of the TCFD provides us with a better understanding of the risks that are relevant to our company.

Implementation of the TCFD Recommendations at Vonovia

Content of the recommendations	Implementation at Vonovia	Further Information
Governance		
Organizational structure of the company regarding climate-related risks and opportunities	> Overall, Management Board bears responsibility for sustainability and climate protection as well as climate-related risks and opportunities; it decides on strategy and targets > Sustainability Committee – comprising the entire Management Board and representatives of the central functional departments Sustainability/Strategy, Controlling, Communication, Investor Relations and Accounting – determines the strategy and targets and monitors progress > The central department Sustainability/Strategy, within the executive division of the CEO, coordinates and drives the measures and their implementation > Climate-related risks are calculated and collated on a half-yearly basis as part of the company-wide risk management process; the process is coordinated by Controlling, with the Management Board taking the final decision on risk assessment > Energy efficiency modernization in the existing portfolio in Germany is the responsibility of the CRO (Regions and Portfolio Management); for Austria, the CDO is responsible, for Sweden, the CEO of Victoriahem > Technical implementation and use of new technologies by Value-add unit > Non-financial indicator Sustainability Performance Index (SPI) includes carbon intensity of the building portfolio	**2021 Sustainability Report:** **→ Environment and Climate** **→ Managing Opportunities and Risks** **2021 Annual Report:** **The Company** **Corporate Structure** **Sustainability Management at Vonovia** **Management System** **Environmental Issues** **Opportunities and Risks**
Strategy		
Actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning	> Climate protection and carbon reduction is a fundamental part of the corporate strategy as a key driver for long-term business success > Binding climate path defined on the basis of various scenarios in partnership with scientific institutions > Comprehensive modernization measures to increase energy efficiency as well as use of neighborhood solutions with renewable energies (fuel switch) > Currently, transitory rather than physical risks are expected, e.g., through legislation in Germany (carbon pricing) and the European Union, as well as through the lack of economic viability of energy-efficient modernization and the development of renewable energy generation (balance between investments, apportionment opportunities and affordability for tenants) > Particularly promising opportunities to generate energy for tenants to use for heating and electricity	**2021 Sustainability Report:** **→ Environment and Climate** **→ Sustainable Construction and Refurbishment** **2021 Annual Report:** **Strategy** **Sustainability Management at Vonovia** **Environmental Issues** **Risk Assessment Based on Sustainability**
Risk management		
How the organization identifies, assesses, and manages climate-related risks	> Climate risks integrated into company-wide risk management process, assessment of all risks by management every six months > Physical risks will be assessed in the future on the basis of regularly updated risk maps > No material risks for building portfolio of Vonovia currently identified	**2021 Sustainability Report:** **→ Managing Opportunities and Risks** **2021 Annual Report:** **Risk Assessment Based on Sustainability** **Opportunities and Risks**
Metrics and targets		
Metrics and targets used to assess and manage relevant climate-related risks and opportunities	> Comprehensive and complete carbon footprint report for building portfolio and business operations according to GHG emissions protocol and IW.2050 > CO_2e in portfolio (in Germany) 2021: 871,290 tons (Scope 1, 2, 3[1]) > Expansion of renewable energies with photovoltaic systems: 451 systems with 16.8 MWp nominal output Targets: > Virtually climate-neutral portfolio by 2045 (<5kg CO_2e/m^2 of rentable area) > Reduction of carbon intensity from current 38.4 kg to <25 kg CO_2e/m^2 of rental area by 2030 > Installation of PV systems with nominal output of >200 MWp on 17,000 roofs by 2030 > Reduction of the average primary energy demand in new buildings to 31 kWh/m^2 by 2025	**2021 Sustainability Report:** **→ Environment and Climate** **→ Sustainable Construction and Development** **→ Environmental Indicators** **2021 Annual Report:** **Strategy** **Management System** **Environmental Issues** **Forecast Report**

1) Scope 3.3: "Fuel- and energy-related emissions upstream".

Reducing CO_2 in the Real Estate Portfolio/ Energy-efficient Modernization

GRI 102-11, 102-13, 103-1, 103-2, 103-3, 302-3, 305-1, 305-2, 305-3, 305-4, 305-5

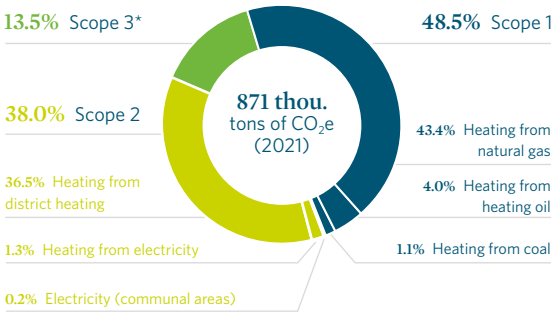
Our Approach

Vonovia is committed to making its property portfolio almost completely climate neutral by 2045. Owing to the size of the company, we see ourselves as a key driver of climate action in the housing industry. This means that we can help the sector as a whole make great strides towards achieving the goal of a carbon-neutral building stock. We track our emissions using the recognized Greenhouse Gas Protocol. Most of our emissions are Scope 1 emissions (direct emissions, approx. 45%) and Scope 2 emissions (indirect emissions caused by consumption of district heating and power, approx. 40%) of the properties in our portfolio. The majority of these are in Germany.

In the reporting year, we further developed our climate strategy and redefined our goal. In light of the new Federal Climate Change Act and the sector targets contained therein, we have set the target of achieving a virtually climate-neutral building portfolio by 2045, with carbon intensity of less than 5 kg of CO_2 equivalents per m^2 of rental area. Along the way, we want to reduce our carbon intensity to less than 25 kg CO_2e/m^2 by 2030. This target has been incorporated into our sustainability performance index (SPI), which affects the remuneration of the Management Board. Carbon intensity is the most significant component of the sustainability performance index in terms of its weighting. The targets were developed as part of an interdisciplinary collaboration between various functional areas and with the support of the scientific community (Fraunhofer ISE). They are contingent – not only on a comprehensive improvement of the building portfolio's energy efficiency through energy efficiency modernization, and an increased share of renewable energies in our neighborhoods – but also on a profound transformation of the energy sector. As such, the provision

CO_2e Emissions – Portfolio (in Germany)

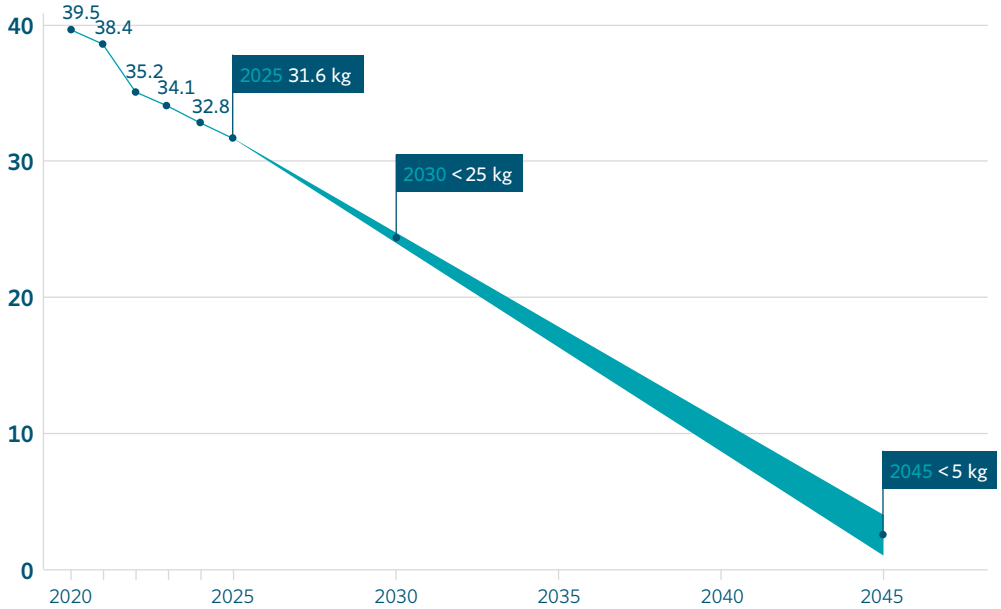
in %



* Scope 3 emissions comprise energy-related emissions upstream and commodities leased downstream.

Vonovia Climate Path: Portfolio Decarbonization Strategy

Carbon intensity in kg CO_2e/m^2a*



The 3 elements of the climate path

1
> Continuation of comprehensive energy efficient refurbishment

2
> Replacement of conventional heating units with hybrid systems and heat pumps
> Photovoltaic systems on all suitable roofs
> Establishment of a local heating network in the neighborhood with renewable energies

3
> Conversion of the energy sector to carbon-free district heating and green electricity

* Includes Scopes 1 and 2 as well as Scope 3.3 "Fuel- and energy-related activities upstream"; referring to German portfolio without Deutsche Wohnen. Development of the energy sector according to the Agora Energiewende KND 2045 scenario; comparison: CRREM path MFH 1.5° DE 2045 = 5.4 kg/CO_2/m^2 (July 2021); development of climate path supported by Fraunhofer ISE.

of sufficient volumes of carbon-free district heating and electricity by the energy sector, coupled with a more rapid phase-out of coal, as described in the Coalition Agreement, are fundamental prerequisites for a climate-neutral buildings sector.

With respect to the attainment of our climate target and the targets of the housing sector as a whole, the right subsidy instruments and the removal of legal hurdles remain decisive. After all, we believe that ambitious, long-term partnerships and above all a different political framework are needed in addition to commitments and investments in order for climate-neutral housing to become a reality and stay affordable. Our commitment to modeling and developing sustainable solutions to mitigate climate change demonstrates that we are operating in a field that is undergoing rapid regulatory change while also attempting to meet the needs of a wide variety of stakeholders and remain profitable.

For this reason, our climate path takes social and economic targets into consideration in addition to the environment. Following the initial definition of the target in 2020, concrete implementation work continued in the reporting year. Energy-efficient refurbishments are a key element of our climate path. A specially developed decarbonization tool makes it possible to break down the Group target at the level of regions and neighborhoods – and identify nuanced solutions (see → **project box "The Vonovia Decarbonization Tool – CO_2 in Focus"**). We make improvements to the tool on a continuous basis in order to identify the optimal balance between carbon targets and our performance as a business. This provides us with the best possible basis for making decisions as a company.

Decarbonization Tool

helps to identify solution strategy

Here, too, the focus lies on the urban quarter, particularly in the context of the energy revolution. Many integrated solutions for energy provision with renewable energies and carbon reduction can only be implemented in a technically feasible and economically viable way within larger neighborhoods. The innovation clause of the German Buildings Energy Act (GEG), for example, is only applicable to neighborhoods. These circumstances have increased our focus on neighborhoods and underline the importance of taking a holistic approach.

Finding solutions at neighborhood level

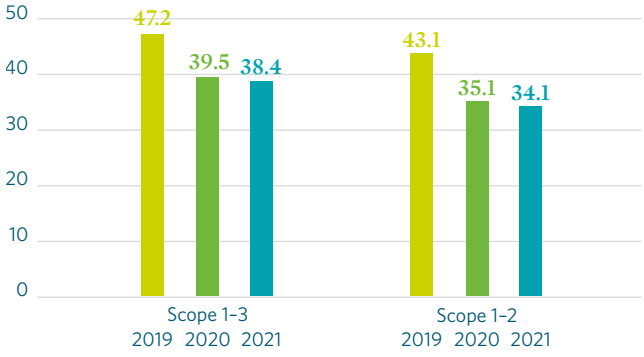
A holistic view of urban quarters

Organizational Focus

The Portfolio Management unit reports to the Chief Rental Officer (CRO) and is responsible for the general planning and coordination of modernization measures in the portfolio. Within the unit, the Climate-neutral Portfolio/Strategic Projects department is tasked with developing solutions for bringing our property portfolio and the corresponding investment strategy in line with our climate action goals. It is also supported by the Sustainability/Strategy unit, which reports to the Chief Executive Officer (CEO). The properties/neighborhoods to be modernized are selected in a targeted manner in cooperation with the regions, and the optimal degree of modernization for each building is defined. Investments for modernization measures are approved by the full Management Board. Compliance rules require the involvement of the Supervisory Board in some cases. The Investment Management department manages the budget for modernizing the portfolio. Vonovia Technical Service (VTS) is responsible for planning and execution.

Carbon Intensity – Portfolio (in Germany)

in kg CO_2e/m^2 of rentable area



Carbon emissions from heating and electricity; comparability restricted between 2019 and 2020 due to change in method.

PROJECT

The Vonovia Decarbonization Tool – CO_2 in Focus

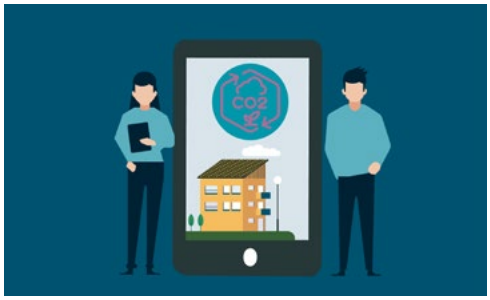
At the start of 2021, Vonovia entered into a development partnership with GLS Bank, the advisory company d-fine, and the climate metrics provider right.based on science, with the goal of developing an IT system to analyze the climate impact of residential property and portfolios. With this, Vonovia is setting new standards in the industry. The digital Decarbonization Tool makes it possible to integrate climate-related key figures as well as energy-technical and economic indicators in the management of neighborhoods and real estate portfolios. The software provides an analysis of the portfolio's climate impact at the current time and in view of the goal of achieving a virtually climate-neutral building portfolio by 2045. The emission reductions achieved by planned modernization projects and community development activities are mapped in the tool and compared with the 1.5°C target set in Paris.

"We firmly believe that the rising pressure on greenhouse gas emissions in the building sector and significant financial risks for the industry urgently require new ideas in order to take the complex interrelationships of building emissions and global warming to a place that allows for sustainable climate-protective building management." Dr. Lars Dittmann, Climate-neutral Portfolio department head.

1.5°C objective

firmly in sight

The Decarbonization Tool is being used to implement the Vonovia climate path at an operational level and aims to address, for example, the effects of modernization, changes in energy sources, and portfolio changes. The tool indicates, for example, whether the Vonovia portfolio as a whole, or individual neighborhoods, are on track to meet the 2045 climate target, and what influence climate-impacting measures have on achieving the target. This is how we intend to manage our target of achieving climate neutrality in the reporting period through 2045 in an economically prudent and ecologically forward-looking manner.



The top four features of the Vonovia decarbonization tool:

> Visualization of the long-term climate impact of modernization measures
> Possibility of establishing regional climate paths
> Prioritization algorithm shows the order of priority in which buildings are to be modernized
> Evaluation of modernization programs by inputting data on the planned or achieved carbon reductions

Energy efficiency modernization measures in Austria are, like overall business operations in Austria, the responsibility of the Chief Development Officer (CDO) under the BUWOG umbrella, where they are led by the Real Estate Management division.

Division heads are responsible for planning investments in modernization work at Victoriahem in Sweden. This process is integrated into the annual budget planning process and is updated in line with the company's business forecast. The investment plan is reviewed by regional managers, the Head of the Energy and Environment Department, business controllers and project managers to make sure that the estimated savings and costs are accurate before the plan is approved by the CFO, COO and CEO.

Objectives & Measures

In line with our holistic approach, our measures focus more on neighborhoods than our individual rental units (see → **Society and Contribution to Urban Development**). In Germany, we use public funding programs to keep modernization work affordable for our tenants. The revised terms of the federal funding program for efficient buildings (BEG) include some interesting options in this respect, such as direct subsidies for modernization work. Serial refurbishment is another approach that will limit the costs of modernization. Serial refurbishment is defined as the process of using pre-fabricated facade and roof elements to refurbish existing buildings with the aim of making them more energy-efficient.

The refurbishment rate in Germany in the reporting year was 2.3%, compared to 2.9% in the previous year. The drop is, among other things, attributable to the new conditions for subsidies and the adjustments to the internal management system to focus on the neighborhood level, which requires more complex and therefore longer planning. In the year ahead, it is expected that the refurbishment rate will once again exceed 2%.

Alongside optimization of building envelopes, the switch to lower-carbon energy sources also stands at the forefront. As part of our quest to achieve a virtually climate-neutral housing stock in 2045, Vonovia is aiming to have reduced the carbon intensity of its housing stock in Germany to below 25 kg CO_2e/m^2 by 2030. In the reporting year, carbon intensity stood at 38.4 kg CO_2e/m^2 and was therefore approx. 2.8% lower than in the previous year (2020: 39.5 kg CO_2e/m^2). The metric comprises Scope 1 and Scope 2 emissions across our entire portfolio, and part of the Scope 3 emissions (fuel- and energy-related emissions upstream and commodities leased downstream). As such, the goal set for the reporting year of a reduction of at least 2% was achieved. In particular, the reduction is based on energy efficiency modernization and an improvement in the carbon intensity of district heating. For further information, please refer to → **Environmental Key Figures**.

NEW NON-FINANCIAL PERFORMANCE METRIC 2021

38.4

kg CO_2e/m^2 living area Carbon intensity of the existing portfolio

(in Germany)

Notes on the Calculation of Carbon Emission

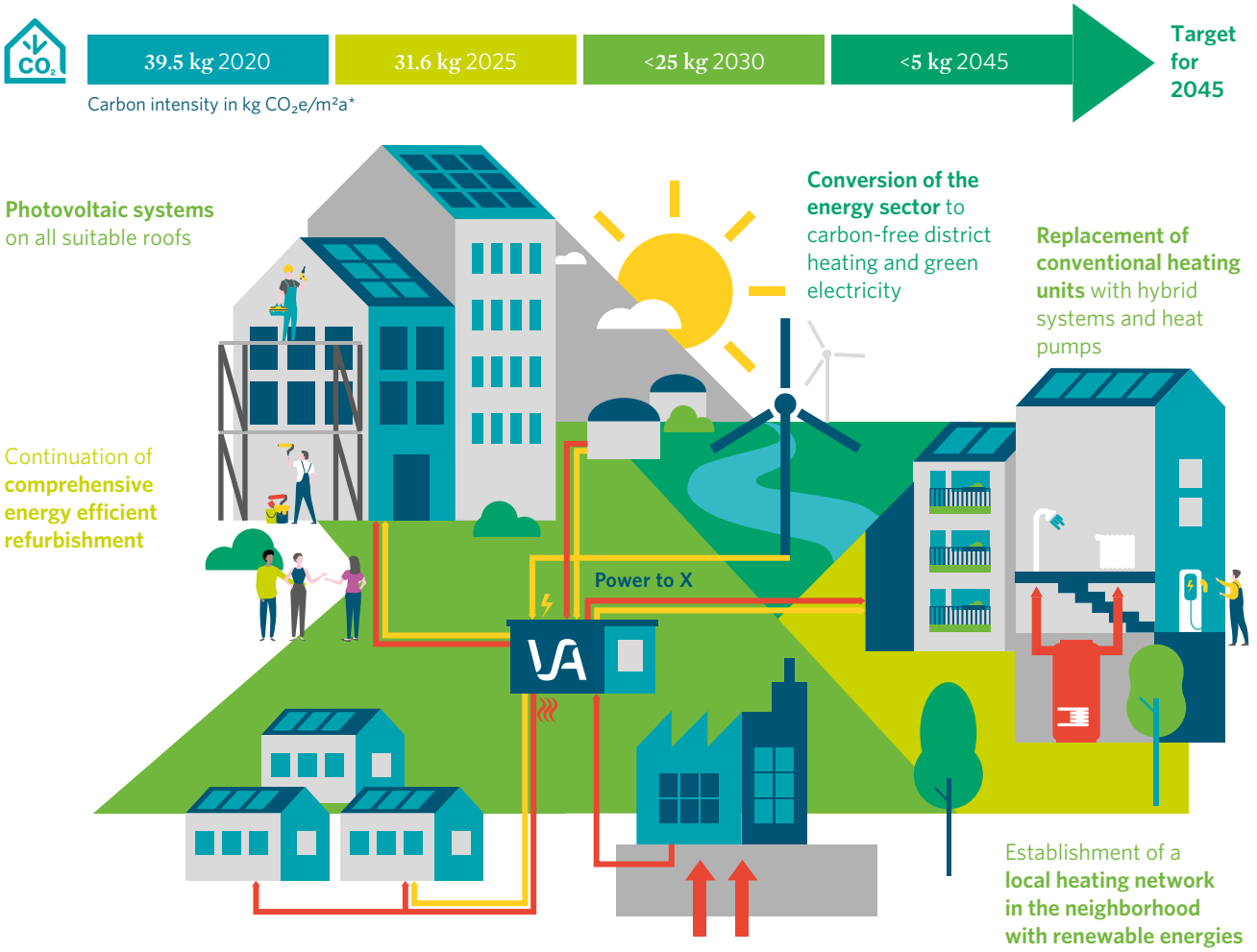
> In accordance with GHG Protocol and IW.2050/ GdW Arbeitshilfe 85
> Total property portfolio, including listed buildings
> Based on energy certificates, in relation to rental area (not total area)
> GEMIS 5.0 carbon factors used
> Specific carbon factors for district heating in some cases
> Including energy-related upstream emissions (Scope 3)

As part of the continuous enhancement of our calculation of carbon emissions, we will make a modification in the calculation of carbon emissions for district heating starting in the 2022 fiscal year, where we will use the Carnot allocation method in the future. This has the advantage that the allocation of carbon emissions between electricity and district heating is based on purely physical considerations, meaning that we can structure our long-term climate strategy and corresponding innovations in a way that is robust against regulatory changes in the long term. Had this method been applied to the building portfolio in the 2021 reporting year, it would have resulted in a theoretical carbon intensity of 35.6 kg CO_2e/m^2.

Focus of energy-efficient modernization measures

The energy-efficient modernization measures focus on heat insulation for facades, basement ceilings and attics, the replacement of windows and the installation of new heating boilers. We modernized around 8,200 units in the reporting year, not including heating system upgrades. That equates to

Vonovia Climate Path: Portfolio Decarbonization Strategy



* Includes Scopes 1 and 2 as well as Scope 3.3 "Fuel- and energy-related activities upstream"; referring to German portfolio without Deutsche Wohnen.
Detailed explanations can be found in the footnote to the climate path chart on p. 25.

a refurbishment rate of 2.3% in Germany for 2021. The year-on-year drop (2020: 2.9%) is, among other things, attributable to the new conditions for subsidies and the adjustments to the internal management system to focus on the neighborhood level, which requires more complex and therefore longer planning. In terms of heating modernization, we focus on the use of hybrid solutions, heat pumps and wood pellets. We are also investigating the potential of connecting to new and existing district heating networks in Germany. We replaced boilers in around 4,100 units in the reporting year. By the end of 2022, we also aim to have replaced all existing oil heating systems in existing buildings in Germany.

Around 8,200

residential units modernized in the reporting year (in Germany excl. heating system upgrades)

When carrying out energy efficiency building refurbishments, we need to consider both the strain on the tenants/residents concerned and the rising costs. Vonovia is committed to using numerous (academically supported) cooperation projects and integrated approaches to find innovative and cost-efficient, effective solutions for energy efficiency and a climate-neutral housing stock. One example of this sort of approach is the Energiesprong initiative, a serial refurbishment concept that uses standardized and pre-fabricated construction components to minimize refurbishment times and maximize residential comfort on the basis of an innovative financing model. The aim of the initiative is to conduct refurbishments to bring buildings to net zero, meaning that they generate as much energy in a year as they consume. The Energiesprong principle is currently being piloted at 24 units in Bochum and is also to be rolled out further within the portfolio at a future stage (see → **project box "Energiesprong: Serial 'Green' Refurbishment"**). Vonovia is also taking part in projects to optimize the operational management of heating systems and the interaction between, for example, system technology, user behavior and structural

PROJECT

Energiesprong: Serial "Green" Refurbishment

Bochum-Mitte: A series-produced Energiesprong element being carried onto the construction site.

In the search for innovative solutions, Vonovia is leading by example. At the end of 2021, in cooperation with the Fischbach Group, the company launched the first carbon-neutral refurbishment in series construction in Bochum-Mitte in line with the Energiesprong principle, which is still in its infancy.

Three residential buildings with a total of 24 apartments are being refurbished in series. The buildings date from the 1950s and will be brought up to a carbon-neutral standard through the Energiesprong refurbishment project. As part of this process, timber-frame facade elements made of sustainable building materials are prefabricated to the precise millimeter. The elements are then simply joined together at the construction site. Due to the high degree of prefabrication, serial refurbishment offers great potential for facilitating the implementation of the energy revolution in the portfolio despite the shortage of skilled workers. In addition, this construction method produces significantly less noise than conventional construction sites. The heating, water and air supply system technology, which has also been completely renewed, is powered by the building's own photovoltaic system on the roof. The carbon emissions caused by the operation of the building will be reduced to zero over one year of operation through the use of 100% renewable energies. Over the course of a year, the building generates exactly as much energy as it consumes (net zero). Another goal of the Energiesprong approach is to achieve a neutral impact at the level of rent including ancillary expenses. Tenants pay exactly the same amount for rent, heating and electricity as they did before the modernizations thanks to the improved energy efficiency.

The energy revolution has top priority at Vonovia, but this should not financially overburden the tenants of our buildings. Thanks to cost-saving series construction and the generation and use of green energy in the neighborhood, the Energiesprong principle will go a long way toward ensuring that refurbishments can be carried out over the long term without additional charges to the tenants.

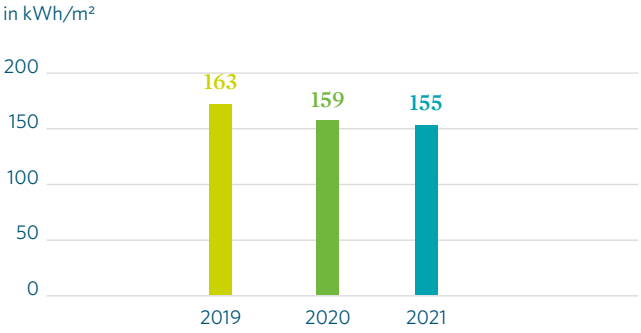
Serial Refurbishment with Energiesprong in Bochum

measures, so as to deliver further cost minimization solutions. One of these is the interdisciplinary research project BaltBest headed up by the EBZ Business School. The purpose of this three-year project was to uncover new ways to reduce the costs involved in heating properties. This was the largest research project of its kind in Germany to date, and identified a number of improvements that could cut heating costs by up to 20% per property. These include optimizing operational management, replacing boilers to save energy, improving communication with tenants about energy consumption and large-scale data gathering.

Cooperation and innovation

for the development of innovative and cost-efficient solutions

Average Energy Intensity in the Portfolio* (in Germany)



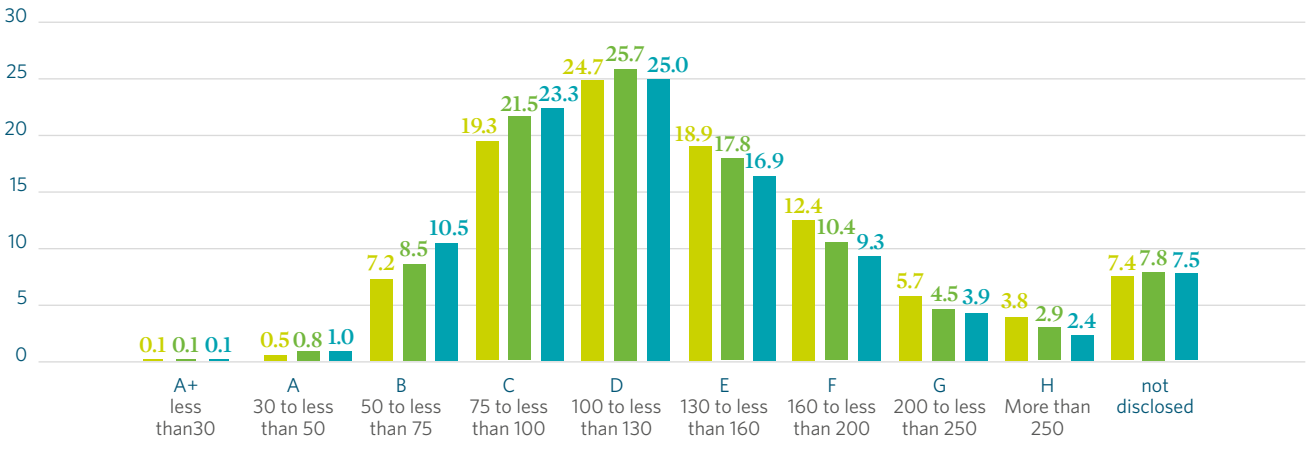
* Relates to final energy demand and rentable area.

We organize events with various stakeholders on a regular basis to provide a platform for dialogue. Following on from our Outlook for Climate-neutral Housing conference in 2020, we held climate discussions in the form of digital lunches for our stakeholders in 2021. Due to their popularity, we have a number of sustainable conference formats planned for 2022, such as a conference on the Outlook for Climate-neutral Construction.

We took part in a number of events held by Initiative Wohnen.2050 (IW.2050) in 2021, of which we are a founding member. The initiative focuses on learning from each other and fostering dialogue, with the ultimate aim of the entire housing industry having a shared understanding of the importance of climate change mitigation and taking a unified approach to combating climate change. The initiative uses a

Energy Efficiency Standards in the Portfolio (Germany) – 34.9% in Efficiency Class C or Better*

Portfolio share in % (relates to final energy demand and rentable area)
Energy efficiency classes in kWh/(m²a)



* Not a like-for-like assessment.

variety of guidelines, tools and dialogue formats on strategic and technical issues for this purpose.

Implementation and active participation in further

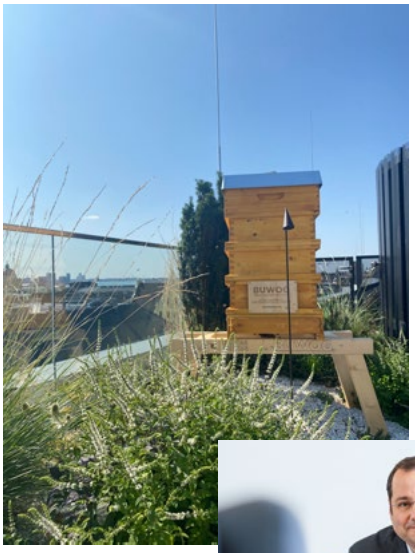
Initiative Wohnen.2050

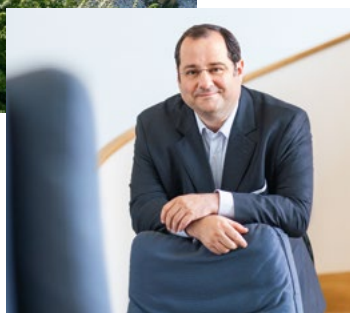
formats in the reporting year

In Austria, BUWOG has been a partner of the "klimaaktiv pakt" climate protection initiative launched by the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology since 2011. Following completion of the first stage of the initiative in 2020, BUWOG has set a new goal as part of "klimaaktiv2030", the aim being to achieve a reduction in emissions of 55% by 2030, compared to the base year of 2005 (see → **project box "Leading the Way: BUWOG Signs klimaaktiv Pakt2030"**). Modernization and improvements to our existing portfolio will account for the majority of carbon reductions. Insulation refurbishments, improvements in the efficiency of heating systems and switching to more eco-friendly energy sources have the most important role to play. BUWOG has also had a certified energy management system that is consistent with ISO 50001 standards in place in Austria since 2013/14 and in Germany since 2018. The system is a tool used voluntarily to systematically manage energy performance and improve it continuously. The corresponding establishment of processes that reflect this policy in the company and clearly defined objectives serve to increase energy efficiency, reduce energy consumption and cut energy costs.

In Sweden, virtually all existing Victoriahem buildings are supplied with district heating, the generation of which already produces extremely low carbon emissions. Therefore, the road to climate neutrality will primarily be shaped by further decarbonization of heating supply, coupled with ongoing improvements in energy efficiency.

PROJECT





Leading the Way: BUWOG Signs klimaaktiv Pakt2030

Climate change mitigation and quality of life must go hand-in-hand. It is with this conviction that BUWOG has made a voluntary commitment to reduce carbon emissions by 55 percentage points by 2030. The Vonovia subsidiary is one of only eleven Austrian major companies – and the only one in the real estate sector – to be accepted into the Austrian Federal Ministry for Climate Action's new "klimaaktiv" pact, and, with its voluntary commitment, even exceeds the target of reducing carbon emissions by half by 2030. This solidifies BUWOG's leading position in the area of climate change mitigation. "We hope that we can also motivate as many other real estate companies as possible to work on reducing their carbon emissions," says BUWOG chief Valerija Karsai. In order to achieve this ambitious goal, BUWOG is implementing a number of measures within the building portfolio – first and foremost, insulation refurbishment, improvements in the efficiency of heating systems and switching to more eco-friendly energy sources. In new construction projects, properties are built exclusively with low-energy status, flanked by greening and environmentally friendly mobility solutions. You can find more about the **klimaaktiv Pakt** online.

„We hope that we can also motivate as many other real estate companies as possible to work on reducing their carbon emissions."

Daniel Riedl, Vonovia CDO

"klimaaktiv"

is a climate action initiative launched by the Austrian Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK). The initiative develops quality standards and, in addition to training and education programs, also offers consultation and information services and has a large partner network in its portfolio.

Renewable Energies and Energy Mix

GRI 103-1, 103-2, 103-3, 302-4

Our Approach

We take a two-pronged approach to achieving our climate objectives: in addition to using energy efficiently and reducing energy consumption (see → **Reducing CO_2 in the Real Estate Portfolio/Energy-efficient Modernization**), we are also committed to expanding our use of renewable energy. Our holistic and neighborhood-based approach will play a significant role in the success of this strategy due to long-term synergy effects and an expanded package of measures. A major lever that can be used to reduce greenhouse gas emissions is the expansion of renewable sources of energy. That is why we see our residential neighborhoods as the linchpin of a decentralized energy revolution. We want to implement innovative methods of generating renewable energies and actively promote their use in our own properties, especially at a neighborhood level. We want to continuously increase the proportion of renewable energies being consumed and generated. We want to do this by making greater use of hybrid heating systems, expanding heat pumps and photovoltaic systems, solar thermal systems, pellet heating and integrated neighborhood systems, which will link these technologies to each other as well as to storage technologies, in order to serve buildings in groups instead of individually. We are also piloting innovative approaches such as the use of hydrogen technology in combination with electricity from renewable sources.

Continual expansion of

renewable energy sources

in the neighborhoods

One of the most important ways in which we contribute to the decentralized supply of renewable energies is by installing PV systems on the roofs of our properties. We will significantly increase our generation capacity over the next few years. We also aim to install photovoltaic systems on all suitable roofs. In light of the increasing regional demand for photovoltaic systems, we have included expanding our use of photovoltaic systems as a key measure of the performance of our regional managing directors.

Ongoing installation of

PV systems

on all suitable roofs

We are convinced that innovation and developing new solutions have a crucial role to play in our ability to achieve objectives in the area of Climate and Energy. We have such a strong focus on innovation and research because because we believe that reducing the carbon emissions of our buildings to zero will not be possible or economically viable simply by implementing energy-efficient refurbishments of building envelopes and using existing technology (see **Vonovia Innovation Platform**).

Vonovia enables its own tenants to buy certified electricity from renewable energy sources via its own energy service company (VESG) so that they can reduce their carbon footprint. In the medium and long term, Vonovia is counting on implementing concepts for supplying energy to its own buildings. Our objective is to maximize the share of energy we produce ourselves for the benefit of our customers and the environment, and also to use it for our housing-related services, e.g., e-mobility. This will also reduce the amount of resources that we consume by simplifying our accounting and administrative processes, consolidating procedures and reducing the workload for employees.

Our plan in Austria involves supplying heat from sustainable energy sources from the public supply network (e.g., district heating in Vienna). We are focusing on an energy mix that includes a significant proportion of renewable energy sources. Wherever possible, we want to provide a way for buildings to generate their own power. We want to avoid changes at a later date as this could involve additional switching costs for residents. This will also ensure that our apartments stay attractive and above all affordable over the long term.

The switch to renewable energy is also fully underway for our portfolio in Sweden. We also have set ourselves a target of reducing energy consumption per square meter by 30% by 2030, compared to 2015 levels. In the future, all of our new buildings will perspectively be certified in accordance with the Miljöbyggnad Silver Standard of the Swedish Green Building Council to ensure a consistently high level of energy efficiency and work together with local energy providers to identify potential savings.

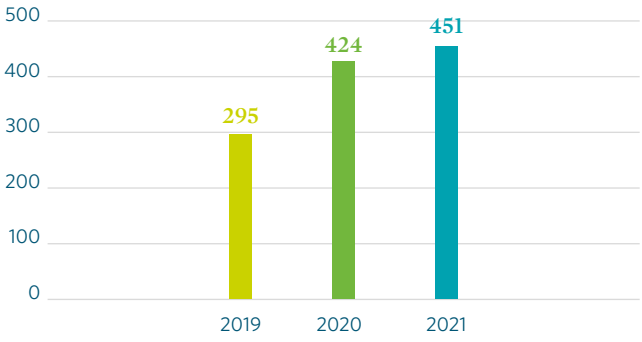
Organizational Focus

All activities relating to renewable energies and energy distribution in Germany are organized in the Value-add business area and are managed by a chief representative who reported directly to the CEO of Vonovia SE until the end of the 2021 fiscal year. This responsibility moved to the Chief Transformation Officer (CTO) with effect from January 1, 2022. Energy sales, through which our customers can sign green electricity contracts directly with Vonovia, are handled through the company's own Vonovia Energie Service GmbH (VESG). The PV program and other innovative approaches aimed at the carbon optimization of the real estate portfolio as part of the neighborhood concept are developed and managed by the Innovation & Business Building department.

Business operations in Austria are the responsibility of the Chief Development Officer (CDO) and Managing Directors under the umbrella of BUWOG. All sustainability-related measures (for both new construction and the existing portfolio) are developed and managed by the Development and Property Management divisions.

The Division Heads of Victoriahem in Sweden are responsible for planning and installing photovoltaic systems on the roofs of buildings in the company's portfolio. The head of the Energy and Environment department and the respective team support this process by providing technical advice and calculating savings in partnership with the Business Controller. The Head of the Energy Management team reports to the COO.

Photovoltaic Plants Installed



Objectives & Measures

One of the milestones along the path to making our portfolio climate neutral is reducing the carbon intensity of the Vonovia building stock to 25 kg CO_2e per m² of rentable area by 2030 and to increase the share of renewable energy sources (see → **Reducing CO_2 in the Real Estate Portfolio/Energy-efficient Modernization**). Expanding use of photovoltaic systems is one of the measures that we are using to achieve this objective. After focusing our efforts on drawing up plans and running trials in 2020, the reporting year was all about scaling up. We achieved our objective of setting up photovoltaic systems on 1000 flat roofs last year (see → **project box "Landlord-to-Tenant Electricity From 30,000 Roofs"**). We want to install photovoltaic systems on 17,000 roofs by 2030 in order to harness the considerable potential of suitable roof areas. This is equivalent to an installed output in excess of 200 MWp (compared to 16.8 MWp in 2021). In order to achieve this goal, we are also investing in in-house installation capacities and creating about 100 new jobs. By 2050, we intend to fit all 30,000 suitable roof spaces in the German portfolio with PV panels. Looking ahead - as soon as the legal context provides the opportunity/the realm - the plan is to perspectively use the energy generated directly as landlord-to-tenant electricity in the individual neighborhoods as soon as the overall legal conditions make this commercially feasible. The first such efforts were started in the year under review.

Creation of

around 100 new jobs

>1,000 roofs

already equipped with photovoltaic systems – target achieved

However, the decentralized energy supply strategy is reliant on some external factors. Our efforts to expand our use of photovoltaic systems in the reporting year were slowed by supply bottlenecks that affected materials like solar modules and meter boxes. The skills shortage also had an impact, as we found when we were unable to meet our need for electricians (see → **Corporate Culture and Employees**). We continued the time-consuming process of fostering expertise internally in response to the skills shortage in 2021. We plan to press ahead with these measures on the basis of our insourcing strategy in 2022, with the goal of carrying out the work through our own craftsmen's organization.

PROJECT

Landlord-to-Tenant Electricity From 30,000 Roofs

In the reporting period, we achieved the target laid out in our 2019 "1,000 roofs" program of fitting at least 1,000 roofs in our portfolio with photovoltaic modules. This still is not enough, though, as Vonovia intends to focus much more heavily on solar energy in the future. Our new goal is to fit every suitable roof in our building portfolio with photovoltaic systems as part of our quest to achieve climate neutrality. That's 30,000 roofs by 2050. By 2030 we want to have already achieved over half of our target with 17,000 roofs fitted, which will generate 194 million kWh of climate-friendly solar power and avoid 76,500 t of CO_2 every year.

Construction Minister of North Rhine-Westphalia, Ina Scharrenbach (pictured here with CEO Rolf Buch) visited the site and was impressed with how Vonovia's plans for increasing the use of renewable energies are being implemented. The "1,000 roofs" program was completed in Bochum in the summer.

We will manage our "30,000 roofs" project ourselves, creating around 100 new jobs. While the energy generated from the "1,000 roofs" program is fed into the public grid for the most part, in the medium to long term Vonovia is seeking to decentralize the energy supply to its own neighborhoods and landlord-to-tenant electricity systems. The green energy generated through our "30,000 roofs" program will be used for landlord-to-tenant electricity in addition to heat generation and e-mobility. Tenants will benefit from this with cheaper electricity costs over the long term.

"Vonovia is taking action and is focusing on landlord-to-tenant electricity. Electricity generated on roofs and made directly available to tenants is setting new standards. It is an intelligent form of energy generation," said Ina Scharrenbach regarding Vonovia's plans to install PV systems on 30,000 roofs.

25,000 customers

were supplied with green power in 2021

We are expanding our activities as an energy services provider because the ability to generate and supply energy on a decentralized basis play a key role in the energy revolution. We supplied green power to around 25,000 customers in 2021 through our energy distribution company VESG (Vonovia Energie Service GmbH). Our focus in terms of energy generation is on promoting networked neighborhood systems and sector coupling. This involves linking the electricity, heating and mobility sectors so that the electricity generated locally and the heat generated can be used for the apartments – turning our neighborhoods into efficient small power plants (prosumers). We are also piloting innovative approaches, such as a wide variety of storage systems – with a particular focus on the short-term and seasonal storage of energy – and maintained our partnerships with a variety of scientific institutions and partners during the reporting year. We opened the Power House of the Future project in April 2021 in Bochum-Weitmar with the aim of researching innovative energy systems and implementing them in practice. The project will also provide vital information and data that will be used to develop and scale technologies. Innovative technologies, including an electrolyzer that uses electricity to produce hydrogen, fuel cells, heat pumps and stratified storage that cover at least 60% of the heating needs of buildings and households in the area with carbon-free heat from a local source. We generate 25% of the power required locally using our own rooftop photovoltaic systems. As part of another research project in Bochum-Weitmar, we are developing an innovation neighborhood with a focus on climate change mitigation in partnership with scientists from a number of different Fraunhofer Institutes and Ampeers Energy GmbH. This project is funded by the state of North Rhine-Westphalia.

Power House of the future

opened in Bochum-Weitmar in April 2021

Linking local energy management systems together in an intelligent way also includes e-mobility approaches. We are still working on the development of a range of scalable mobility concepts and solutions for needs-based charging infrastructure. Since each neighborhood is unique and has its own features and requirements, we are developing the concepts in such a way that the regions can use them as they see fit. One core element of our research and development work in this area is the expansion of charging infrastructure. The plan is for tenants with their own parking space to get a wallbox on request and pay for their electricity through Vonovia.

Biodiversity

GRI 303-5, 306-2

When designing our neighborhoods, we find a balance between what is ecologically valuable and what is economically sensible. We take care to choose appropriate measures, such as landscaping, planting trees, installing nesting boxes, creating urban meadows and making sure there are suitable habitats for insects. We use forward-looking plans to ensure that aspects such as maintenance and potential future changes in climatic conditions are taken into account. We have established standard procedures for preparing biodiversity reports for flora and fauna. The purpose of these reports is to ensure that all of the animal and plant species in an area are protected and maintained. We also use woodland surveys to determine the health and conservation value of the roughly 215,000 trees that comprise the woodland in the vicinity of our buildings and neighborhoods. We take a number of steps to maintain biodiversity when building new homes, such as the creation of green areas (see → **Sustainable Construction and Refurbishment**).

Over the course of the reporting year, we gradually expanded our partnership with Naturschutzbund Deutschland e. V. (NABU), which began in 2019. Over 30 projects have been completed or are being developed nationwide on the basis of this partnership in locations including Berlin, Leipzig, Hamburg, Osnabrück and the Ruhr valley. Since this partnership began, in addition to converting over 100,000 m² of general purpose lawns into wildflower meadows, we have created more than 250 insect habitats and installed over 500 nesting boxes for swifts and roosts for bats. The NABU experts also recommended site-specific seed mixtures for the 22 different geographic areas in Germany. We continued to work together in 2021 on projects aimed at the revitalization of habitats in rainwater retention basins and other worthwhile causes. We also organized a coronavirus-safe walk through the neighborhood in partnership with NABU so that the tenants of our pilot neighborhood in Bochum-Weitmar would have a chance to learn about our commitment to protecting biodiversity when we develop residential

environments. We also held a walk for our stakeholders (incl. communication with the city, the Emschergenossenschaft water board, the planning office, NABU and Vonovia community development).

>100,000 m²

of general purpose lawns converted into wildflower meadows

More than 500

nesting boxes for swifts and bats created

We are also working together with the NABU at our site in Bochum. An ecological nature trail is being created around Vonovia's headquarters, which will inform employees and visitors about the eco-friendly measures we are implementing in our residential environments.

Ecological nature trail

around the corporate headquarters in Bochum created as part of the cooperation with NABU

We actively involve our tenants in order to raise their awareness of ecological issues, e.g., by landscaping common areas to make them close to nature or setting aside spaces that can be used for urban gardening. We launched a partnership with the non-profit organization Acker e. V. (previously known as Ackerdemia e. V.) in 2020. We support the "Gemüseakademie" project, which uses vacant land on the grounds of nurseries and primary schools to grow fruit and vegetables. This gives children a chance to find out about plants and gardening. We will use other projects like "Bohnenabenteuer" and "Ackerhelden" to make the residents of our neighborhoods more aware of biodiversity. We include articles about projects of this kind in our customer magazine "zuhause" on a regular basis.

We take the suggestions of our tenants into consideration when we run projects to upgrade their residential environment. We integrated a wide range of suggestions from our tenants into the redesign of the neighborhood in Duisburg-Hüttenheim, for example. We are planning to include a wildflower meadow and an insect habitat, along with other green areas for tenants. Vonovia also commissioned a woodland survey so that we can protect as much of the local woodland as possible. We worked together with experts to decide which trees to keep and which should be replaced by planting new trees. To date, we have created around 170 tenant gardens nationwide. In the coming years, we anticipate a significant expansion of this scheme to more than 2,000 tenant gardens in Germany.

Around 170 tenant gardens

created nationwide

Water, Effluents and Waste

GRI 303-5, 306-2

The increasing scarcity of water is becoming an increasingly important topic of discussion in Germany. Climate change is already making itself known in the form of longer periods of dry weather and more frequent heavy rain and storms. We are assuming that these will become more common in the future. Although our portfolio has been relatively unaffected so far, we are preparing for the possible consequences. To this end, we are working on measures that will help to mitigate extreme weather conditions at a microclimate level or have the capacity to cool urban heat islands, such as greening the facades of buildings or installing roof trenches. We need an innovative approach to water management that will be able to handle the challenges of the future. There is significant potential in local rainwater seepage systems (based on retention basins and green roofs, for example) and using rainwater to water gardens.

We integrated additional risk and damage minimization measures into our standard processes during the reporting year. These include soil and flood surveys, which will allow us to draw up more effective water management plans for our neighborhoods. Our planning process includes a digital terrain model in order to minimize water damage. In the future we intend to use our existing geoinformation system to improve the available data even further so that we can plan and implement measures with even more precision.

The BIM method (building information modeling) is one of the ways in which this is supported in the planning of open spaces.

Digital terrain model

in order to minimize water damage included in planning process

Examples of water management measures in our portfolio:

> Partnership with NABU NRW to revitalize habitats in rainwater retention basins and to create green roofs and facades with the help of tenants (in progress since 2020)
> Implementation of a community development project with integrated rainwater management in the Eltingviertel in Essen (in progress since 2020)
> Implementation of a pilot project to prevent water damage by identifying and communicating burst pipes early in order to keep consequential damage to a minimum (in progress since 2020)
> Planning of integrated water management in the pilot neighborhood of Bochum-Weitmar (including cooperation and study with the Fraunhofer Society)

We use water-saving sanitary systems in our offices to reduce water consumption. We provide drinking water systems for the roughly 1,000 employees who work at the corporate headquarters in Bochum to reduce their use of plastic.

Waste separation concepts for good waste management and the promotion of recycling play a particularly important role in our construction and refurbishment work because they enable us to reuse valuable resources like windows (see → **Sustainable Construction and Refurbishment**). They are also becoming increasingly relevant for waste management purposes in our neighborhoods. During the year under review, we expanded our use of sustainable recycling schemes in our neighborhoods. We launched a pilot project in a neighborhood in Essen to investigate ways in which we can recycle green waste and separate household waste. Our findings will be rolled out to other neighborhoods in the future. We separate the waste produced in offices and common areas and do not use disposable items in the cafeteria. In Sweden we involve our tenants in the subject of waste separation and tell them about the opportunities that exist in the area of waste separation and prevention. This is one
of the ways in which we plan to significantly reduce the amount of waste in Sweden – by 30% by 2030.

By means of careful documentation and monitoring of the work carried out on the construction sites by qualified staff and health and safety officers, we always strive to ensure that (contaminated) materials are disposed of correctly and lawfully. We provide Vonovia technicians with training on how to dispose of materials correctly.

There is also potential in how we manage our green spaces. We recycle horticultural waste for energy production in biomass power plants, compost green waste and use leftover wood offcuts as lumber. We are making use of these opportunities by developing new and sustainable schemes for recycling and reusing materials.

Energy Efficiency and Carbon Reductions in Operations

GRI 302-1

Letting homes is not a resource-intensive business. In contrast to the situation in the manufacturing industry, our business operations only account for a small part of our carbon emissions – around 3%. Nevertheless, we continuously seek out opportunities to increase our level of resource efficiency and reduce our impact on the climate and the environment in our internal processes. Our vehicle fleet, our tools and appliances, our own office buildings and the behavior of our employees all offer opportunities to make a difference, e.g., by transitioning the fleet to low-emission vehicles, using power-saving electrical appliances for work in neighborhoods, buying green power for office buildings and avoiding business travel and transport.

We completed a DIN EN 16247-1 energy audit in Germany in 2020. The areas that were identified for improvement can be applied to the entire Group due to the homogeneity of asset structures and consumption patterns at Vonovia. The audit found that Vonovia employees were highly aware of how to use energy efficiently. We use a number of energy-saving and resource-efficient measures in our offices, including LED lighting, motion sensors to turn lights on and off, and air-source heat pumps as an energy-efficient heating solution. We are also moving towards paperless offices.

Measures already implemented in the vehicle fleet:

> Fuel-efficient vehicles procured
> Transparency ensured by assessing consumption of individual vehicles
> Conversion to e-vehicles in Austria
> Training course on fuel efficiency for drivers/ employees
> Use of electric vehicles for short trips
> Eco-tuning
> Use of fuel-saving tires and engine oil

The company is also working towards using and generating energy in a manner which is better for the environment by switching all of the administrative buildings that it owns over to green electricity provided by VESG. This switchover will start on January 1, 2022, with around 60 sites concentrated in the South region. In the future, all of these sites will be supplied with carbon-free green electricity. All office locations of BUWOG in Austria have used certified green electricity (UZ46) since 2021. In addition to improving our carbon footprint, this also optimizes our internal processes. We want to roll this model out to other regions in 2022.

All administrative buildings in the company's own portfolio gradually switching over to

green electricity

provided by VESG

The vehicle fleet accounts for about three-quarters of emissions from our business operations. Vonovia has around 5,750 vehicles, the majority of which are used by our service technicians. This is therefore where we have the most leverage for reducing carbon emissions in our own processes. We continued the process of switching our fleet over to low-emission vehicles over the course of the year. Whenever possible, we provided innovative transport solutions based on small low-emission vehicles. The company limited the speed of its commercial vehicles to reduce emissions. We are also continuing to switch our fleet over to electric vehicles and are using more bikes and electric bikes. Electric vehicles are now available as company cars. We continued to add electric vehicles to our fleet in Austria. This allowed us to reduce the average emissions of our fleet from 221 in the previous year to 210 g CO_2e/km. Average fuel consumption was 6.9 l/100 km (2020: 7.3 l/100 km). As a result, we reduced our overall fuel consumption despite increasing the size of our fleet by around 60 vehicles.

Further reduction in average emissions of the fleet to

210 g CO_2e/km

(previous year: 221 g CO_2e/km)

Our residential environment organization also made significant advances during the reporting year, and replaced around 1,000 combustion engine components with environmentally friendly battery-powered versions. The new appliances are highly recyclable and have the potential to significantly lower carbon and noise emissions, benefiting our tenants and improving the health of our employees.

Around 1,000

combustion engine components replaced with environmentally friendly battery-powered versions

Sustainable Construction and Development

GRI 102-9, 102-13, 302-5
UNGC Principle 1, Principle 7, Principle 8, Principle 9

Disclosure

Taking responsibility for the environment, conserving resources and meeting the needs of society are the foundation for lasting success in the real estate industry. In addition to a growing awareness of sustainability among our customers and partners, we are seeing more and more ambitious targets being set at a government and regulatory level. In 2021, the German government set itself the objective of achieving climate neutrality by 2045. The European Union announced a net zero target as part of the European Green New Deal, which it intends to meet by 2050. The EU Taxonomy lays down criteria in a number of relevant areas, including energy efficiency of new buildings, climate change adaptation, the circular economy and the use of materials. On the other hand, demand for new homes remains high; the recently signed Coalition Agreement expects 400,000 new homes to be built each year.

As one of the largest residential real estate companies in Europe, we can make a decisive contribution to meeting these objectives by finding approaches to building and development that are both sustainable and economically viable. This is particularly important given the fact that residential real estate is frequently used for far more than 50 years. Because of this, all of our new construction and refurbishment efforts have to be fit for the future so that we can meet the challenges that lie ahead. Increases in the price of materials and supply chain disruption have the potential to pose a risk to the economic viability of construction and development projects. By researching and using innovative construction materials and processes, we can meet our obligations to society and under the law, while also achieving our own sustainability and climate change mitigation objectives and remaining economically viable and competitive.

HIGHLIGHTS 2021

> Primary energy demand of newly built apartments introduced as a key performance indicator in the SPI 2021 Sustainability Performance Index – this amounted to 38.6 kWh/m² in 2021

> 2020 target almost achieved: 2,135 new apartments completed Group-wide (target: approx. 2,300)

> More than 90% of new buildings completed in Germany are in energy efficiency class A or A+

> Signing of the new "klimaaktiv Pakt2030" agreement and pursuit of the climate targets set therein until 2030

> Analysis of the climate footprint of a building throughout its entire life cycle and the use of sustainable construction methods (e.g., hybrid-timber structures and pre-fabricated parts)

Our holistic approach to construction and refurbishment extends to how we procure and use sustainable materials and products, in addition to ensuring that statutory requirements are met in our supply chains. We are committed to implementing the requirements of the Duty of Care in Supply Chains Act (LkSG) in order to identify and minimize risks in the supply chain. An additional benchmark here will be the applicability of the minimum safeguards criteria of the EU Taxonomy. These criteria help to make our supply chains more resilient and less susceptible to disruption. Failing to meet these requirements would damage the reputation of Vonovia and could result in legal fees.

We have identified **Sustainable Construction and Refurbishment** as a material topic due to its importance in the context of our business model. Other important topics are **Sustainable Materials and Products** and **Social and Environmental Standards in the Supply Chain**.

Sustainable Construction and Refurbishment

GRI 102-9, 102-13, 103-1, 103-2, 103-3, 302-5

Our Approach

Vonovia's construction projects create fairly priced homes that are urgently needed, particularly in metropolitan areas. Our construction and conversion projects focus on optimizing energy efficiency, renewable energy and using environmentally conscious construction methods that conserve resources, with a greater use of renewable resources. We also make sure that the layouts of our buildings and developments are suitable for a wide variety of lifestyles, in addition to providing accessible homes. Our strategy is economically and ecologically sustainable, and combines profitability with our objective of being climate neutral by 2045 (see → **Climate Path**).

Climate and energy-efficiency targets

an integral part of Management Board decisions on new construction projects

We set clear targets and integrate sustainability aspects into our decision-making processes. We have clear, Group-wide targets for energy consumption and efficiency standards for all construction projects. The average primary energy demand of newly constructed buildings, in relation to rental area, make up the most important performance indicator. This performance indicator is part of the planning process and must be made transparent as part of all Management Board approvals of newbuild and development projects.

By taking a holistic neighborhood-based approach to developments, we bring together planning expertise and construction (see → **Society and Contribution to Urban Development**). This involves focusing on vertical expansion and densification in order to provide additional homes while minimizing surface sealing. Our approach is complemented by our Building Information Management (BIM) strategy, which allows us to identify effective measures on the basis of data from across the entire life cycle of our neighborhoods. This reflects our commitment to long-term sustainability, which takes a close look at every stage of a building's life – from

finding plots of land through to handing over the keys and demolition – in order to minimize its emissions, the impact it has on the environment and the amount of resources that it consumes. Our holistic approach to the planning process includes incorporating elements such as playgrounds and leisure areas, charging stations and wildflower meadows into the residential environment. The progress that has been made – particularly in terms of reducing the annual carbon emissions of our portfolio and the energy efficiency of new buildings – was incorporated into the SPI, a non-financial indicator that was introduced in 2021 (see **Sustainability in the Corporate Strategy**).

It is extremely likely that only projects that meet the KfW40 standard will be subsidized in Germany going forward. Based on guidance from the government, this standard will be the new statutory construction standard from 2025 onwards. We are already using this standard as a benchmark in our projects. We also look at the option of applying for sustainability certification for large-scale development projects from the German Sustainable Building Council (DGNB), its Austrian counterpart the Austrian Sustainable Building Council (ÖGNI), or for certification in accordance with the klimaaktiv building standard or the Green Pass. These certification programs make it possible to verify and compare the sustainability performance of different properties so that we can meet the expectations of a wide variety of interest groups, such as investors, owners, tenants and the general public.

Organizational Focus

BUWOG focuses on the development of high-quality residential neighborhoods for the company's own portfolio (to hold) and for direct sale (to sell) in Germany and Austria. These activities are the responsibility of the Chief Development Officer (CDO), and the individual development projects are approved by the Management Board. Until recently, Vonovia Technische Service GmbH (VTS) worked together with the regions in Germany on new construction projects, with a particular focus on densification and the addition of extra stories as part of our neighborhood development projects. The decision was made to integrate the new construction division of VTS into BUWOG Germany during the reporting year. The central Procurement department is responsible for supplier management and the processes for procuring construction materials and services. Architects, technical building service engineers and structural engineers are responsible for agreeing on the best use of sustainable construction methods, insulation and technology in internal modernization and development and construction projects. All plans for development and new construction projects are examined carefully by the Vonovia Management Board and approved.

Objectives and Measures

To achieve our aim of creating new and affordable housing, we set ourselves a target of around 2,300 completions for the portfolio and direct sales (to hold and to sell) Group-wide in 2021. By completing around 2,200 apartments across the Group, we almost reached this target despite the coronavirus pandemic. Across the Group we were able to

Valuable Contributions to Society and the Group

Development

1 Acquisition	2 Development	3 Planning	4 Construction	5 Marketing and Sales
> Identification of acquisition opportunities > Assessment of development opportunities > Due diligence (legal, tax, technical, environmental, etc.) > Cross-disciplinary acquisition teams > Development of project pipeline, property database	> Design idea > Analysis of market and regulations > District and city representatives, citizens, service providers and other stakeholders > Construction optimization and city development > Coordination of zoning	> Integral planning and cross-disciplinary project teams > Type and product development > Determination of aesthetic, ecological, functional and economic requirements > Detailed project calculation > Professional planning > Coordination of construction approval process	> Preparing for construction > Procurement and awarding of construction contracts > Trade coordination/construction management > Construction > Quality control	> Development of marketing concepts > Sale > Initial rental > Customer service and aftercare

transfer 1,373 of these new residential units to our own portfolio, of which 1,073 are located in Germany. In addition, 8,000 further apartments are in the planning stage – including for the company's own portfolio. The overall potential (to hold and to sell) is significantly higher and comprises – including the medium-term development potential of 36,000 units – a development pipeline of approximately 49,000 residential units (see **Portfolio in the Development Business**).

2021 target of

2,300 completions

almost reached

The average primary energy demand of newly constructed buildings, in relation to rental area, make up the most important performance indicator. Our aim is to reduce this significantly in the medium term. The increase in average primary energy demand in 2021 (2020: 35.7 kWh/m², 2021: 38.6 kWh/m² per year) is attributable to projects that had already been planned and approved under other framework conditions prior to the setting of our goals. For the same reason, we expect this figure to increase slightly in 2022 to 49.0 kWh/m² per year, before going down significantly in subsequent years (2025 forecast: 31.0 kWh/m² per year). This will be achieved by insulating buildings to a high standard, focusing on district heat with a low primary energy factor and the increased use of air source heat pumps combined with photovoltaic systems. These efforts have allowed some projects to meet the KfW Effizienzhaus EE standard, which requires a building to use renewable energy for more than 55% of its heating and cooling needs.

During the reporting year, we analyzed the climate footprint of a building throughout its entire life cycle (i.e., from the manufacturing process used for the construction materials through to the running of the building and its ultimate demolition) in order to find ways to make the construction process more environmentally friendly and less resource-intensive. We compared six different construction methods in terms of their carbon emissions, primary energy requirements and resource intensity. We will use the results of this analysis to calculate the emissions and requirements of all of our development and construction projects so that they can be incorporated into the planning phase. This data can also be used as the basis for subsidies and certification in future. The next step of this process involves determining the costs involved in each of these construction methods. We will also be taking a closer look at the methodology that we use to assess the disposal and reuse of materials.

NEW NON-FINANCIAL PERFORMANCE METRIC 2021

38.6

kWh/m² p. a. average primary energy demand of new buildings (2020: 35.7 kWh/m²)

is based on energy performance certificates, excluding purely commercial spaces and vertical expansions

Investigation and analysis of the

climate footprint

over the life cycle of a building

We believe that this approach will allow us to compare a range of different construction methods in terms of their sustainability, expense and potential for a return. This will make it possible for us to use sustainable construction methods involving wood frame, solid wood or hybrid-timber structures, in addition to using pre-fabricated parts. We will continue our strategy of integrating different energy sectors together and generating our own energy. These approaches will provide new ways to significantly reduce our carbon emissions. A pilot project looking at this area is due to start in 2022, and will involve a total of 167 residential units in the Münsterberger Weg neighborhood in Berlin. The project will be the largest neighborhood made purely of timber structures from a single provider. It will also integrate a number of different energy systems together in order to ensure that more than 55% of the neighborhood's energy comes from

PROJECT

Living on the Water: 52° Nord Sponge City

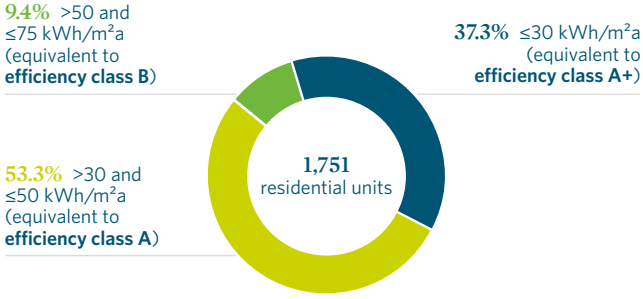
BUWOG's THE VIEW trio was completed in June 2021.

More green spaces, less soil sealing – that's what the climate needs. In Berlin-Grünau, BUWOG is developing the **neighborhood 52° Nord** on a former industrial wasteland on the banks of the Dahme River. It is based on the concept of a "sponge city", embedded in a comprehensive sustainability strategy that pays special attention to the integration of biodiversity and seepage areas for rainwater. Rainwater is becoming more and more valuable as periods of drought and heat become longer and more frequent, even in Germany. It is therefore not drained away in the sponge city of Grünau. Instead, in addition to the green spaces, a 6,000 m² rainwater retention basin with plants was integrated into the planning process. Based on the sponge city model, this basin collects the rainwater from the surrounding properties, cleans it biologically and returns it to the natural water cycle. It also serves as a biotope for aquatic animals and insects and helps to create a cooler microclimate on hot days. The neighborhood's sustainability strategy also includes green roofs, an efficient local heating network and the advancement of electromobility.

In 2020, the BUWOG sponge city project was presented with the "Award Deutscher Wohnungsbau" for German construction projects. This is awarded by the Federal Foundation for Building Culture (Bundesstiftung Baukultur) in partnership with other organizations. By 2025, around 1,000 rental and owner-occupied apartments will be built as part of various sub-projects that will meet a wide range of requirements, from family homes close to nature to student apartments, and will ensure a mixed and lively neighborhood life. One of the most architecturally imposing ensembles is BUWOG's THE VIEW complex of three buildings, which was completed in June 2021.

Over 90% of New Buildings Completed in Line With Efficiency Class A or Better*

Breakdown in %



* Based on energy certificates, excluding purely commercial spaces and extensions. Proportion in relation to rental area.

renewables. The project also marks the first time that Vonovia Technical Service (VTS) will be responsible for supplying energy to a neighborhood in this manner. The 94 units completed between 2020 and 2022 that make up the Kompass- und Lotsenhäuser project in the 52°Nord neighborhood in Berlin-Grünau are made from hybrid-timber material and meet Niedrigstenergiehaus energy standards. A large proportion of the facade elements and floors are made from pre-fabricated European timber and meet the current KfW 40 energy efficiency standards.

We play our part in the circular economy by using construction materials that are separated out at the end of their life cycle so that they can be reused in future construction

projects. BUWOG has put the circular economy at the heart of a pilot project called Monte Laa in the 10th district of Vienna. The tender process involved specific questions about the planned amount of recycled and recyclable materials, which factored into how the bids were assessed. We will discuss and champion these and other approaches at our "Perspectives on the Future of Construction" conference, which is planned for 2022 (see → **project box "Construction Conference 2022 – a Look at the Future of Construction"**).

We have also spearheaded activities in this area outside of Germany, with one example being our involvement in the "klimaaktiv pakt" in Austria. The "klimaaktiv pakt" climate protection initiative was launched by the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology. BUWOG has been involved in the initiative for many years. A new agreement was signed in 2021 with targets set out for 2030. BUWOG is the only company in the Austrian real estate sector to have signed up to the agreement. It is now committed to reducing its carbon emissions by 55% by 2030, compared to the base year of 2005. The initiative is largely focused on modernizing our existing portfolio, but does also set some criteria for new construction projects. It primarily addresses insulation refurbishments, improvements in the efficiency of heating systems and switching to more eco-friendly energy sources. All of BUWOG's construction projects meet the Niedrigstenergiehaus standard. Additional measures like adding green spaces and providing environmentally friendly mobility solutions (charging stations, rental bikes, parking spaces for bicycles) will also improve the sustainability of our neighborhoods (see → **Reducing CO_2 in the Real Estate Portfolio/ Energy-efficient Modernization**). The 25th floor of the Marina Tower project in Vienna's second district was completed in January 2021. The project will provide around 500 new residential units spread over 40 floors by spring 2022. The project was awarded the klimaaktiv GOLD certificate in 2020 due to the high quality of its construction materials and products, the fact that a comprehensive product and chemical management system is being used throughout the construction project, and the planned use of geothermal energy for heating, cooling and electricity due to the building's proximity to the Danube. In Sweden, we aim for new buildings to meet the requirements of the Miljöbyggnad Silver Standard set by the Sweden Green Building Council. With this in mind we provide our employees with annual training courses on energy and environmental topics.

Following the end of the previous pact, a new agreement was signed in 2021 with

targets set out for 2030

Making sure that construction site management are aware of their responsibilities has a key role to play in ensuring that construction and refurbishment are done in a sustainable way. The German Occupational Safety and Health Act (ArbSchG) requires us to meet a high standard when it comes to protecting the health of our employees and promoting their well-being (see → **Promoting Health and Safety**), as do employer's liability insurance associations and the German Employee Secondment Act. Construction site compliance with these requirements is ensured by a safety and health coordinator to ensure that these requirements are implemented and complied with as completely as possible. Our general contractors and subcontractors are also subject to strict safety standards. These include measures like risk assessments and discussions, on-site safety inspections, rules about fencing, warning signs, protective clothing and safety equipment, in addition to an obligation to provide regular training for all employees (see → **Promoting Health and Safety**).

The German Waste Management Act (AWG) sets strict requirements for waste management. Mistakes like failing to sort waste properly carry the risk of significant financial penalties. While we are committed to sustainability in its own right, this provides an additional financial incentive to make sure that we have a responsible approach to waste management. That is why we include the cost of disposal in our tenders as standard in Germany and Austria.

Designing the residential environment and preserving biodiversity are top priorities for us (see → **project box "Living on the Water: 52° Nord Sponge City"**). Numerous buildings feature green spaces that serve as natural habitats for flora and fauna at ground level, on roofs or on facades. In addition to the optical effects, these green spaces also offer a practical added value, for example, by slowing the flow of rainwater into the partially overburdened municipal sewage system and by making a considerable contribution to the microclimate, especially by preventing heat from building up in densely populated urban areas. Attention is also paid to conserving resources and protecting the environment during the construction phase, too (see → **Biodiversity**).

PROJECT

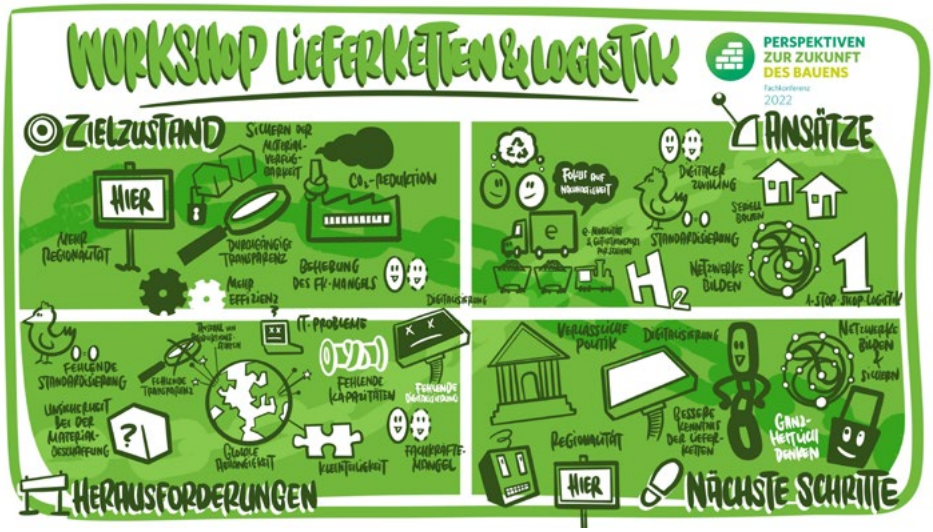
Construction Conference 2022 – a Look at the Future of Construction

The workshops provided a forum for intensive discussion and collaboration in small groups.

The construction and real estate sector has a major social responsibility when it comes to climate protection targets. Vonovia intends to live up to its responsibility. On March 23, 2022, we organized a conference in partnership with the Fraunhofer Alliance on **"A look at the future of construction"** at the Berlin Design Offices. This event gave us the opportunity to discuss the topics of environmentally friendly and resource-conserving construction with various stakeholders.

The conference laid the foundations for discourse surrounding sustainable construction. In four workshops, players from the worlds of business, science and politics tackled the topics of production of building materials, renewable resources, recycling, and supply chains and logistics. Particular attention was paid to the question of pricing policy, the availability of raw materials, and the conflict between sustainability and economic efficiency. After all, the future of construction ultimately needs to be both sustainable and affordable for buyers and tenants.

In the coming months, the working groups will begin to develop detailed proposals and approaches for the climate-friendly future of construction, which will be presented at the final event on November 23, 2022, at Futurium Berlin.



We also implement a number of measures to protect species that are under threat. We make sure to follow all of the relevant statutory requirements in this area and ensure that surveys are done at an early stage of the planning process for every refurbishment or construction project to determine whether the project poses a threat or an issue to any protected plant or animal species in the area. We follow a strict statutory framework – which includes the German Federal Nature Conservation Act (BNatSchG) in Germany and the Federal Environmental Impact Assessment Act (UVP-G-200) in Austria – in addition to municipal building regulations and our internal planning guidelines (such as those related to protecting woodland areas and incorporating protected species into the planning process) in order to protect any species in the immediate vicinity of the construction site that may be under threat. We commission all surveys required under biodiversity legislation whenever we buy new areas or plots of land for construction purposes. Whenever a survey uncovers a protected species, we implement a wide range of measures to ensure that this species is protected from the impact of any construction or refurbishment projects. We do this in close partnership with specialists and the relevant authorities. Whenever necessary, we purchase land that can be used as an alternative habitat for endangered animal populations or for planting. Biodiversity surveys were used as part of the planning phase for the new development project on the grounds of the former freight yard at Brunsbütteler Damm in Berlin-Spandau. This project was scheduled to provide 320 units for students, families and older people by 2024. Before work began, we relocated a colony of sand lizards – which are strictly protected – to an appropriate habitat in partnership with the authorities in Spandau. In 2021, BUWOG worked closely together with the Nature Conservation Office in Leipzig to commission a survey of potentially protected species in advance of the construction of the Lößniger Straße neighborhood in the city's Bayerischer Bahnhof district. BUWOG secured a 5.5 hectare area near the Hainer Lake as an alternative biotope for the population of green toads that were found by the survey. Their new habitat is due to be ready in spring 2022.

Sustainable Materials and Products

Using sustainable materials and products for construction, refurbishment and demolition work has an impact on the climate and the environment and is becoming increasingly important. Sustainable construction methods such as modular timber or hybrid methods have a lower energy consumption and reduced carbon emissions over their entire life cycle (see → **project box "850 Cubic Meters of Wood for Sustainable Construction"**). We also use mineral wool for insulation, which has less of an impact on the environment than commonly used polystyrene-based insulation. It is also important that buildings can be broken back down into their original constituent parts so that these materials can be fed back into the circular economy. Timber structures that are held together with screws and joints perform very well in this regard. In early 2021, we took our next step forward in this area by becoming a partner of Madaster, an initiative developing a global registry of materials. The online platform functions as a library of materials. We use it to manage data about the materials that go into our properties and create material passports. These documents contain information about the quality, origin and location of the materials used in a particular building. They also provide an insight into the financial value of a building and its materials, while also giving users an indication of the value of these materials in the circular economy.

Madaster partner

since early 2021 –
an initiative to develop a global cadastre for materials

Raw materials in buildings are valuable resources that can be reused in various different ways. In the future, we therefore want to include the life cycle costs (production, operation, maintenance, refurbishment, reclamation) of components and products in the product manual and planning guidelines for procurement purposes. Our product manual for Germany and Austria will have a section on the circular economy. The product manual will also be made binding for our partners in these countries and form part of our contracts with them. As part of our Building Procurement Days, we run training workshops to inform our employees about the importance of sustainability in their day-to-day work and in the supply chain.

PROJECT

Prefabricated modules are delivered during the construction period.

850 Cubic Meters of Wood for Sustainable Construction

Sixty new apartments and a commercial unit have been constructed at Amendestraße on the corner of Herbststraße in Berlin using resource-conserving wooden modular construction systems. On October 5, 2021, the new building was opened after only 18 months of construction. Three-quarters of the apartments are barrier-free.

Timber construction offers numerous advantages when it comes to sustainability. The production process generates less than 30% of the carbon emissions of conventional solid construction. In addition, the timber also permanently absorbs CO_2 – approximately one ton per cubic meter. It is also possible to deconstruct and reuse a large number of individual parts from the timber construction. Finally, the tenants benefit from a pleasant and healthy indoor atmosphere.

-30%

carbon emissions with timber construction compared to conventional solid construction

Modular construction approaches can cut construction time by a long way, and can drastically reduce the impact that the construction has on the residents of the surrounding buildings. In addition to the specific environmental advantages of modular timber construction, the project at Amendestraße incorporates yet more features of sustainable building design. The complex has been equipped with an air-to-water heat pump, a photovoltaic system and a green roof. Rainwater will largely be allowed to seep into the property grounds and will not be released into the sewer system.

"Modular construction combines several pioneering elements of sustainable construction ranging from building materials to energy supply. In addition to saving resources, we were also able to save valuable time with the modular construction approach and see the process used at Amendestraße as a recipe for success that we plan to apply to other similar projects in the future." Sebastian Jung, Managing Director – East, Vonovia

Vonovia is committed to using environmentally sound raw materials and production methods, as well as sustainable and recyclable construction materials. We also drive product innovation in these areas where necessary. Sustainability and cost-effectiveness are not mutually exclusive. We prioritize energy-efficient electrical equipment in all of our renovation and construction projects, and are working hard to use more products that are made from secondary raw materials. In response to the increasingly tight rules surrounding the disposal of materials, we avoid using hazardous or toxic substances from the outset. Whenever the disposal of hazardous or contaminated building materials

requires careful professional handling, we expect all of our service providers to comply with applicable legislation and regulations, particularly those concerning health and safety and environmental protection. Our own employees also receive regular training on these subjects.

Social and Environmental Standards in the Supply Chain

GRI 308-1, 308-2

We take the entire life cycle of new construction and refurbishment projects into consideration; this extends to how we procure materials from suppliers. That's why compliance with social and environmental standards in the supply chain is an important topic for us and part of our sustainability strategy. We are also committed to making sure that all of our construction and refurbishment projects meet health and safety standards. Vonovia manages its partnerships with external partners and service providers through the Business Partner Code, its general terms and conditions of purchasing and individual agreements as part of its structured approach to supplier management. In this way we ensure compliance with all current European procurement standards and regulations. In 2022, we will focus on enhancing our processes in light of the requirements of the Duty of Care in Supply Chains Act (LkSG), which will be applicable in Germany as of January 1, 2023. This process also includes the review of existing guidelines, codes and processes, e.g., the aforementioned Declaration of Respect for Human Rights. An additional benchmark here will be the applicability of the minimum safeguards criteria of the EU Taxonomy. In Sweden, we defined environmental criteria that will be binding for all new suppliers from 2021 onwards. These criteria will be made binding for all other suppliers from 2025 onwards.

The Vonovia partner portal plays a vital role in our sustainable approach to supplier management. Social and environmental standards are integrated into the processes we use to select and approve suppliers (see → **Sustainable Relationships With Business Partners**). We require our partners to observe and apply our product manual in order to promote the procurement of sustainable materials. We also communicate with them regularly about ecologically friendly construction materials. More about compliance with labor and social standards in the supply chain can be found under → **Respect for and Promotion of Human Rights**.