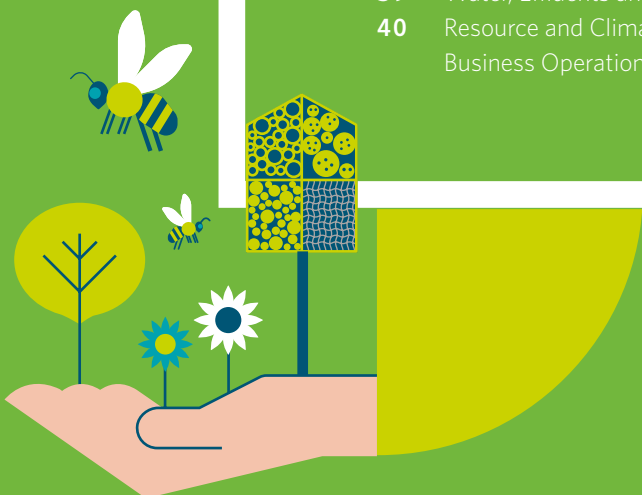




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- 22** Environment and Climate
- 23** Implementation of the TCFD Recommendations
- 25** CO₂ Reduction in the Housing Portfolio
- 32** Sustainable Construction and Refurbishment
- 36** Sustainable Materials and Products
- 38** Protecting Biodiversity
- 39** Water, Effluents and Waste
- 40** Resource and Climate Protection in Business Operations



Environment and Climate



GRI 2-23, 2-24, 2-25, 3-3, 201-2, 302-4, 302-5, 305-1, 305-2, 305-3, 305-4, 305-5
UNGC Principle 1, Principle 7, Principle 8, Principle 9
SASB IF-RE-130a.1



Disclosure

Climate change and resource shortages are not abstract future problems. They are already clearly noticeable in all regions of the world. The mitigation of global warming and the protection of natural resources for life on earth are some of the most important challenges facing society as a whole in our time. Corresponding agreements have been made and specific targets set all around the world. These include, at international level, the Paris Agreement and the European Union Green Deal, and at national level, such as the goal set for Germany by the Federal Government this year to achieve climate neutrality by 2045. At the same time, there is a constant demand for new homes – the German government has set a target of 400,000 new homes each year.

The real estate industry has an important part to play in tackling these tasks. The construction and operation of residential properties causes a large amount of greenhouse gases, directly and indirectly, and consumes considerable resources. As the housing industry market leader in Europe, we aim to be a central driving force behind climate and environmental protection. With a portfolio of more than 550,000 residential units 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 in the industry.

Maintaining and promoting biodiversity in the residential environment is also important to us in addition to protecting the climate. As a residential real estate company, we believe it is our job to make a positive contribution to biodiversity and environmental protection.

One vital aspect of our everyday work is a conscientious and careful attitude toward the use of resources and – wherever possible – reusing and recycling materials and products.

Our activities are impacted heavily by economic and legal conditions. These can change abruptly in some cases. Currently, the economic environment is dominated by

HIGHLIGHTS 2022

- > Climate path confirmed incl. Deutsche Wohnen; alignment with Paris targets confirmed externally
- > Carbon intensity in Germany improved from 38.4 to 33.0 kg CO₂e/m²
- > Development of Climate risk tool for analyzing physical climate risks
- > Launch of heat pump initiative with more than 100 buildings in Dortmund
- > Average primary energy demand of new constructions reduced by more than 2% to 37.7 kWh/m² per year
- > More than 98% of new buildings completed in Germany are in energy efficiency class A or A+
- > Cross-sector dialogue process “Perspectives on the Future of Construction”
- > Embedded carbon emissions determined for completed new constructions
- > Modular wood construction strengthened by strategic cooperation with GROPYUS AG

changes in interest rates and the rising cost of construction and materials. Other factors include the form that building efficiency standards take, the associated public authority subsidy conditions, the breakdown of the CO₂ price on fossil fuels between tenants and landlords, and the legal measures to restructure the electricity and heating sectors.

We are also observing growing demand for sustainable investment opportunities and products on the financial markets. Financial institutes are being pushed by regulators to ensure more transparency regarding the sustainability of their asset portfolios and, like companies in the industrial sectors, report in accordance with the EU Taxonomy. The analysis of long-term developments and their impacts on the business model is also growing in importance (see → [Implementation of the TCFD Recommendations](#)).

During the merger of Vonovia's and Deutsche Wohnen's materiality analyses, we combined a number of action areas and redefined topics in our sustainability reporting. The Environment and Climate action area consists of two material topics: **Reducing CO₂ in the Housing Portfolio** and **Sustainable Construction and Refurbishment**. Other important topics include **Sustainable Materials and Products**, **Protecting Biodiversity, Water, Effluents and Waste** and **Resource and Climate Protection in Business Operations**.

Implementation of the TCFD Recommendations

GRI 3-3, 201-2

With our climate strategy, we are systematically addressing climate change – with regard to both our contribution to mitigating climate change and the effects of climate change on our company's economic development. Our climate pathway combines grand ambitions for CO₂ reduction with the economic efficiency required to implement them. In continuing to develop this path further, we maintain an overview of the risks, e. g., those resulting from future increases in prices for causing CO₂ emissions or the impact of climate change on our buildings, as well as the opportunities, e. g., in the form of climate-resilient and particularly competitive neighborhoods. The recommendations made by the Task Force on Climate-related Financial Disclosures (TCFD) constitute important guidance in this regard.

During the reporting year, Vonovia developed an IT tool in accordance with EU taxonomy requirements in order to analyze the physical risks associated with climate change. This tool enables physical climate risks to be identified and evaluated for the Group-wide portfolio on a continuous basis using the prescribed climate scenarios (RCP2.6, RCP4.5 and RCP8.5). This climate risk tool covers Vonovia's portfolio and development projects in Germany, Austria and Sweden and allows material negative impacts on our business activities due to the effects of climate change to be analyzed at portfolio and property level. The climate risks examined using this tool are heat, cold, drought, increases in precipitation, wind and storms, snow loads and flooding. Depending on the granularity of the available data source, we measure climate risks at the building or neighborhood level and are able to complete a climate risk assessment for each building in the portfolio.

The risk assessment is based on scenario RCP4.5, which, according to the United Nations (UNEP Emissions Gap Report 2022), represents the probable increase in the global average temperature that will result from the national contributions to climate change mitigation that have currently been defined and implemented. In this scenario, no material risk has been identified for any of the climate-related hazards up to 2045.

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	<ul style="list-style-type: none"> > The entire Management Board bears responsibility for sustainability and climate protection, as well as climate-related risks and opportunities > 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 spearheads 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. > The Value-add unit is responsible for technically implementing and using new technologies > The central non-financial performance indicator Sustainability Performance Index (SPI) includes the carbon intensity of the building portfolio 	<p>2022 Sustainability Report: → Environment and Climate → Management of Opportunities and Risks</p> <p>2022 Annual Report: ☐ The Company ☐ Corporate Structure ☐ Sustainability Management at Vonovia ☐ Management System ☐ Environmental Issues ☐ Opportunities and Risks</p>
Strategy		
Actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy and financial planning	<ul style="list-style-type: none"> > As key drivers of long-term business success, climate protection and CO₂ reduction are fundamental components of the corporate strategy > A binding climate pathway, taking into account various scenarios, defined in cooperation with the scientific community. > An extensive modernization program to increase energy efficiency, as well as the use of heat pumps and neighborhood solutions with renewable energies (fuel switch) > Transitory rather than physical risks currently expected, including through legislation in Germany (CO₂ pricing) and the European Union, as well as through a lack of cost-effectiveness of energy efficiency modernization and the development of renewable energy generation (balance between investments and capacity for passing on costs/affordability for tenants) > Opportunities in particular through decentralized internal energy generation for the supply of heating and the provision of electricity for tenants 	<p>2022 Sustainability Report: → Environment and Climate → Sustainable Construction and Refurbishment</p> <p>2022 Annual Report: ☐ Strategy ☐ Sustainability Management at Vonovia ☐ Environmental Issues ☐ Risk Assessment Based on Sustainability Aspects</p>
Risk Management		
How the Organization Identifies, Assesses, and Manages Climate-Related Risks	<ul style="list-style-type: none"> > Climate-related risks form part of the company-wide risk management process; half-yearly evaluation of all risks by the management > In the future, physical risks will be evaluated on the basis of regularly updated risk maps > No material risks currently identified for the Vonovia building portfolio 	<p>2022 Sustainability Report: → Management of Opportunities and Risks</p> <p>2022 Annual Report: ☐ Risk Assessment Based on Sustainability Aspects ☐ Opportunities and Risks</p>
Metrics and Targets		
Metrics and Targets Used to Assess and Manage Relevant Climate-Related Risks and Opportunities	<ul style="list-style-type: none"> > Comprehensive and complete carbon footprint for the building portfolio and business operations in accordance with the GHG Protocol and IW.2050 > CO₂e in the portfolio (in Germany) in 2022: 1,019,431 metric tons (scopes 1, 2, 3¹⁾) > Expansion of renewable energies through PV: 533 systems with a nominal output of 19.3 MWp <p>Targets:</p> <ul style="list-style-type: none"> > Virtually climate-neutral housing stock by 2045 (<5 kg CO₂e/m² rental area) > Reduction of CO₂ intensity in Germany from current level of 33.0 to less than 25 kg CO₂e/m² of rental area by 2030 > Installation of photovoltaic systems with a nominal output of around 280 MWp by 2030 > Reduction in average primary energy consumption in new buildings to 27 kWh/m² by 2025 	<p>2022 Sustainability Report: → Environment and Climate → Sustainable Construction and Refurbishment → Environmental Key Figures</p> <p>2022 Annual Report: ☐ Strategy ☐ Management System ☐ Environmental Issues ☐ Forecast Report</p>

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

CO₂ Reduction in the Housing Portfolio

GRI 3-3, 3, 305-1, 305-2, 305-3, 305-4, 305-5

Our Approach

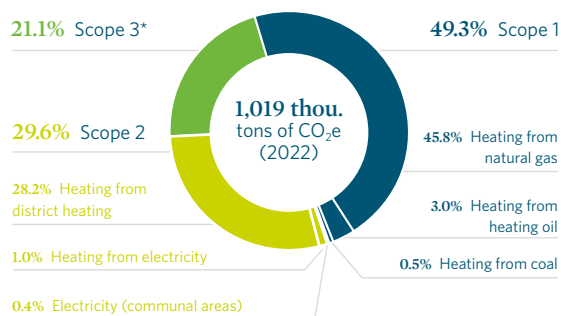
Environmental and climate protection play an important role in our sustainability strategy. Our main focus is on the greenhouse gas emissions that we have a direct influence on – Scope 1 emissions (direct emissions group-wide, approx. 45%) and Scope 2 emissions (indirect emissions caused by consumption of district heating and power, approx. 30%) of the properties in our portfolio. We also account for various greenhouse gas emissions in the upstream value chain, including in the upstream chain of the energy sources we use. These and other Scope 3 emissions along with other environmental aspects are becoming increasingly important for our company.

Vonovia has set itself the target of achieving a virtually climate-neutral housing stock by 2045, with carbon intensity of less than 5 kg of CO₂ equivalents per m² of rental area. By 2030, our housing stock in Germany is to have a CO₂ intensity of less than 25 kg CO₂e/m². These targets remain unchanged following the merger with Deutsche Wohnen and were confirmed in 2022.

In terms of its weighting, carbon intensity is the most important component of our sustainability performance index (SPI), which is our key non-financial performance

CO₂e Emissions – Portfolio (in Germany)

in %



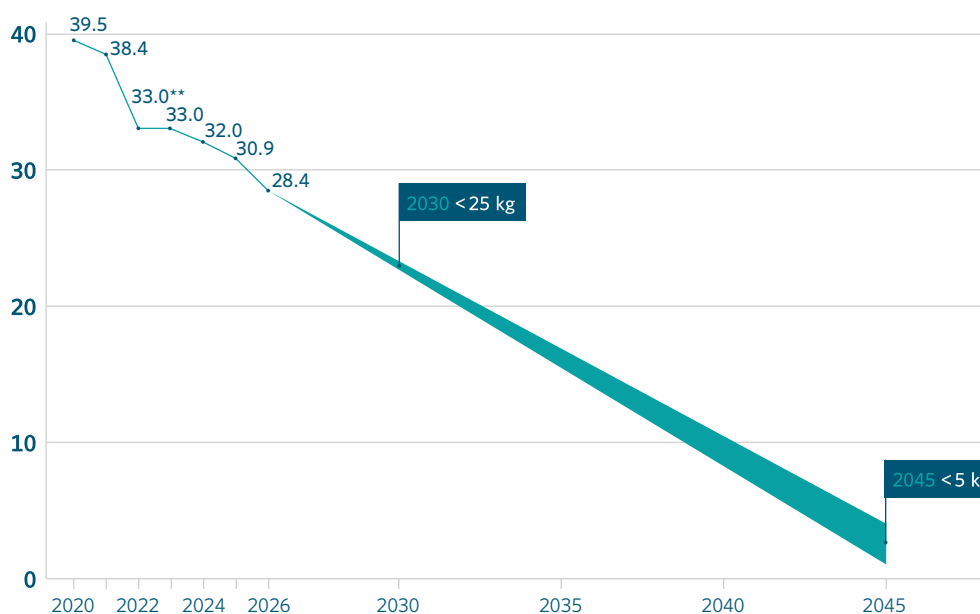
* Scope 3 emissions comprise energy-related emissions upstream and downstream leased assets.

indicator. In this context, it is also fully integrated in investment planning and linked to specific targets through the five-year planning. As part of the SPI, it also forms part of the remuneration for the Management Board and the top levels of management.

During the reporting year, we had the Vonovia climate pathway's compatibility with the Paris Agreement target calculated using the XDC model from right.based on science. The XDC model converts CO₂ emissions based on our climate pathway into a number of degrees that shows by

Vonovia's Climate Pathway: Strategy for Decarbonizing the Housing Stock

CO₂ intensity in kg CO₂e/m²a*



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 & 2 as well as scope 3.3 "Fuel- and energy-related activities upstream"; referring to German building stock. Development of the energy sector according to the Agora Energiewende KNDE 2045 scenario; comparison: CRREM path MFH 1.5° DE 2045 = 5.4 kg/CO₂/m² (July 2021); development of climate path supported by Fraunhofer ISE.

** Carbon intensity in 2022 better than was assumed at time of planning.

how much the earth's temperature would increase if the entire world's climate performance were identical to that of Vonovia. This calculation reveals that Vonovia's climate pathway is compatible with global warming of 1.4° Celsius. The 1.5° target path of the Carbon Risk Real Estate Monitor (CRREM) for multifamily residences in Germany (as of 07/2021) was used as a benchmark.

Vonovia climate path
compatible with

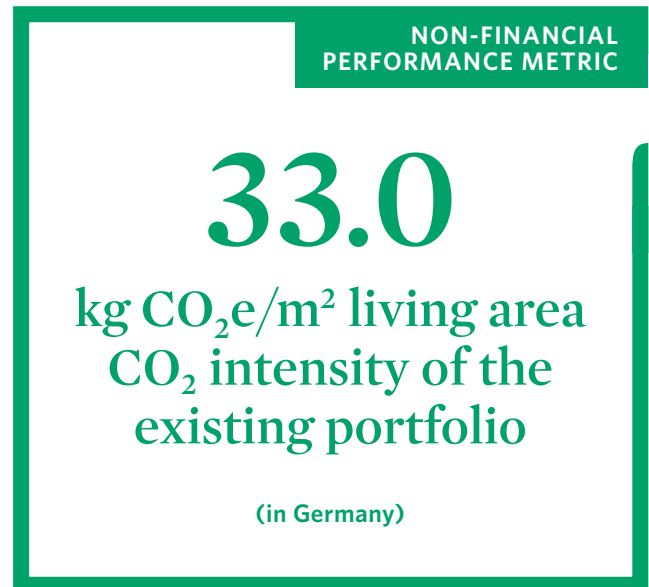
1.5°C target

In the 2022 fiscal year, the carbon intensity for our housing stock in Germany was 33.0 kg CO₂e/m² (2021: 38.4 kg CO₂e/m², excluding Deutsche Wohnen). As we switched to using the Carnot method to calculate district heating CO₂ emissions in 2022, as announced in the previous year, the values are not entirely comparable. Once adjusted for method, there is a reduction of around 10% compared with the previous year's figure (CO₂ intensity in 2021 taking into account the Carnot method: 35.6 kg CO₂e/m², excluding Deutsche Wohnen). Carbon intensity has therefore already reached the level planned for 2023. In addition to the modernization measures, this can also be attributed to our further improved monitoring, as part of which numerous energy performance certificates were updated and the specific emission values of a major district heating supplier were taken into account.

We expect CO₂ reduction to slow down in 2023 in comparison with the previous years. Due to the rise in the cost of construction and changes in interest rates, the focus is more on the implementation of modernization work already begun and in the planning stages. Investments in refurbishment will be down against the previous year. Since we already exceeded our CO₂ reductions targets in previous years, this won't endanger our ability to stick to our climate path. In the future, we aim to return to our long-term refurbishment rate of above 2.5%.

Organizational Focus

The Group's climate strategy is coordinated by the Sustainability/Strategy unit, which reports to the Chief Executive Officer. 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



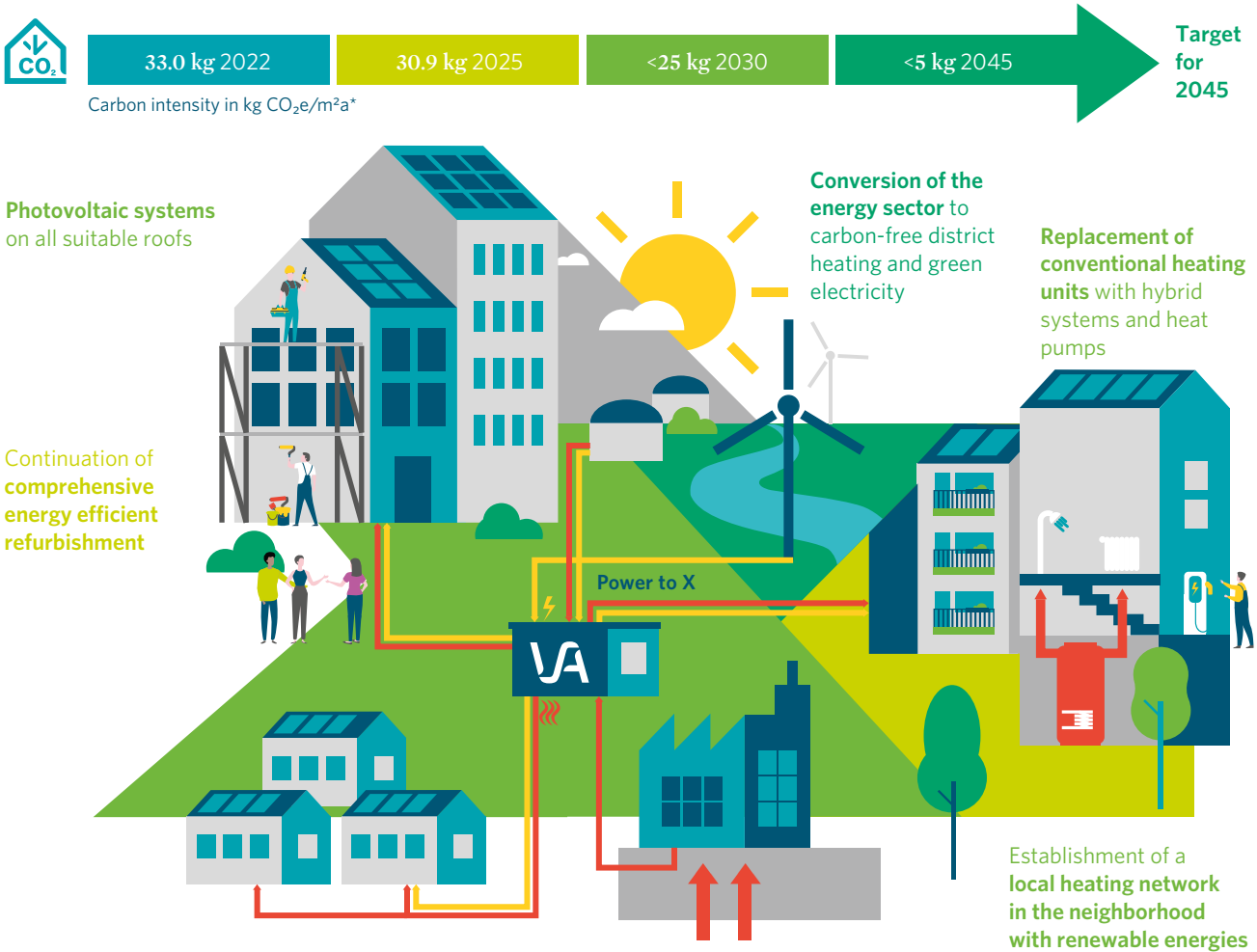
German portfolio. Within the unit, the Climate-neutral Portfolio department is tasked with developing solutions for bringing our property portfolio and the corresponding investment strategy in line with our climate action goals.

The properties and neighborhoods to be modernized are selected in a targeted manner in cooperation with the regions, and the right modernization for each building is defined. The investments for the modernization programs are approved by the Management Board.

The Investment department manages the budget for modernizing the portfolio. Vonovia Technical Service (VTS) is responsible for planning and execution. Renewable energy activities – especially the photovoltaic program and energy sales in Germany – are organized by the Value-add division. They are managed by the Chief Transformation Officer. 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).

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. 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

Vonovia’s Climate Pathway: Strategy for Decarbonizing the Housing Stock



* Includes Scopes 1 and 2 as well as Scope 3.3 "Fuel- and energy-related activities upstream"; referring to German portfolio. Detailed explanations can be found in the footnote to the climate path chart on p. 25.

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 in Sweden and his 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 head of the Real Estate Development Department.

Objectives and Measures

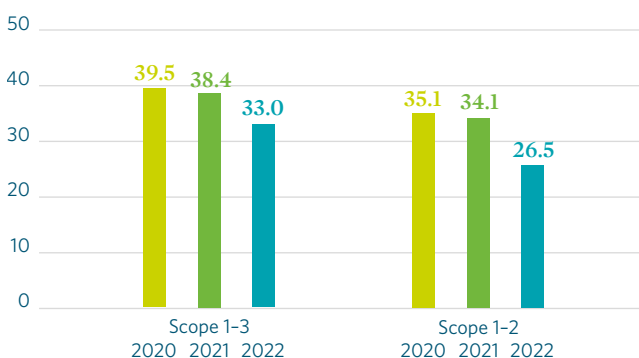
We have three levers for implementing Vonovia’s climate pathway: comprehensive energy-efficient modernization work, increasing the share of renewable energies within neighborhoods and a fundamental transformation of the energy sector.

Energy-Efficient Modernization

Energy-related modernization to improve energy efficiency is an essential pillar of our climate pathway. In order to determine the ideal modernization pathway for the portfolio, Vonovia developed the decarbonization tool (DKT), which digitally reconstructs the housing stock and calculates the current and future greenhouse gas emissions of each building. Climate-relevant key figures and energy-technical and economic indicators are fed into the tool. The decarbonization tool defines priorities based on economic efficiency and carbon reduction and so determines the ideal point in time for the modernization of each individual building. Differentiated solutions are identified for all neighborhoods, which are then set out in more specific detail in the development plans for each particular neighborhood. The decarbonization tool received the DENEFF RealGreen Award in the reporting year.

Carbon Intensity – Portfolio (in Germany)

in kg CO₂e/m² of rental area



Carbon emissions from heating and electricity; comparability restricted between 2021 and 2022 due to change in method.

A new end-to-end process for ensuring efficient cooperation between all departments involved in neighborhood development was defined during the reporting year. The neighborhood advisors provide an interface between the various stakeholders, bundle requirements and information in the context of neighborhood development and act as the link between Vonovia’s internal departments. In the future, this will allow the different neighborhoods to be treated individually, and tailored, economically viable concepts to be developed in terms of a modular system for scalable solutions that focus on linking the heat, electricity and mobility sectors. In doing so, we adopt a holistic view of the neighborhood, examining both the modernization of the building envelope (insulation of facades, basement ceilings and attics, and replacement of windows) and the conversion of the energy supply to climate-friendly systems in their wider context. We believe that many integrated solutions for energy provision with renewable energies and CO₂ optimization can only be implemented in a technically feasible and economically viable way within larger neighborhoods.

Public-sector subsidy programs are being used for many of the modernization measures in order to minimize the costs for our tenants. Here, federal subsidies for energy-efficient buildings (BEG) play a particularly crucial role. Planning in the real estate sector involves long timescales and is complex in a neighborhood context. The BEG’s subsidy eligibility conditions, which changed multiple times at short notice, made it much more difficult for us to plan in the reporting year. For us to be able to successfully implement our climate pathway, we need reliable framework conditions and predictable subsidy eligibility conditions. While the inclusion of district heating in the CO₂ Cost Sharing Act provides an incentive to reduce emissions, it also represents an additional liability for future investment opportunities.

We completed energy-efficiency modernizations in around 6,800 units in Germany in the reporting year, not including heating system upgrades. This equates to a refurbishment rate of 1.9% (excluding Deutsche Wohnen). The year-on-year drop (2021: 2.3%) 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, the refurbishment rate will be between 0.3% and 0.8% due to the challenging interest rate environment, increased construction costs and reduced subsidies.

In order to make energy-efficient building refurbishment even more cost-effective in the medium and long term, we continued to forge ahead with serial refurbishment in the reporting year. In Bochum, a refurbishment project comprising 24 apartments was completed in accordance with the Energiesprong principle. Preparations for further serial refurbishment projects are currently underway. Additionally, Vonovia is undertaking remote digital monitoring of heating systems to ensure optimized operational management and early detection of faults.

With regard to heating modernization, we have begun to ramp up the electrification of heat production against the backdrop of the current situation on the energy markets. We therefore launched a heat pump initiative in the reporting year (see → **Heat Pumps Task Force**). This represents a further step in the implementation of our climate pathway. Our aim here is to further reduce the CO₂ intensity of buildings that already have a good energy efficiency standard and cut demand for gas within the portfolio by up to 30%. In Dortmund, a pilot-scale batch of single-energy-source systems will be installed in 50 heating networks with over 100 buildings. Building on the results of this pilot, the initiative is to be rolled out to other regions in 2023.

Renewable Energies

Another aspect of implementing the climate pathway is increasing energy generation from renewable sources. To achieve this, Vonovia launched a long-term program to expand photovoltaic capacity in 2021. In the reporting year, Vonovia owned 533 photovoltaic systems with an installed output of 19.3 MWp. The 24.4 MWp target was not met due to supply difficulties and delays associated with the network operators.

Overall potential has increased as a result of the merger with Deutsche Wohnen. Our new aim is to continuously increase the additional installed output per year and to achieve an installed output of around 280 MWp by 2030 (compared to 19.3 MWp in 2021). Since 2022, we have focused exclusively on tenant installations, where the electricity generated is used within the neighborhood itself – to supply our tenants

Heat Pumps Task Force

Vonovia is working on different scenarios and solutions to reduce dependency on the import of fossil fuels. One of these consisted of establishing the interdepartmental “Heat pumps task force” in the company.

Our target: We intend to reduce our gas demand by 30% by 2027 and install approximately 6,000 heat pumps in the next five years. We are therefore expanding our



As a first step in the operational implementation, a batch of single-energy-source heat pump systems was ordered in the reporting year at short notice. Unlike the hybrid solutions often used, these run completely on electricity.



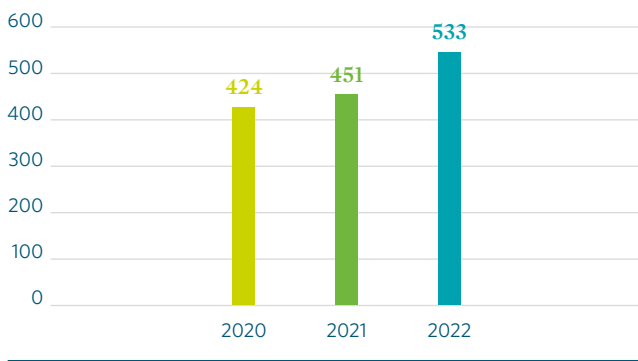
“From the cooperation with Fraunhofer ISE, we expect a better understanding of the optimal use of heat pump technology.”

**Dr. Klaus Afflerbach,
Project Manager in the
Portfolio Management**

expertise so that over time we can standardize the process of expanding and installing heat pump technology in our portfolios. We are exchanging information with the Fraunhofer Institute for Solar Energy Systems (ISE – a leader in heat pump research) regarding the selection of new technologies and operational and strategic issues. In the pilot phase we are initially focusing on the regional area of Dortmund – a location that is well prepared for the deployment of heat pumps due to a high number of buildings already having been refurbished.

The intention of our approach is to recognize and exploit optimization potential at an early stage. Our task force represents a paradigm shift at Vonovia from fossil fuels to low-carbon energy sources, simultaneously making us a pioneer in our sector.

Photovoltaic Plants Installed (Number)



and to power heat pumps. The installation of these systems is therefore also closely interlinked with the heat pump initiative and the modernization program.

In order to achieve the targets for PV output, we are also investing in in-house installation capacities and creating about 100 new jobs in total. In 2023, installed output is set to more than double to around 43 MWp. In the long term, we intend to fit all suitable roof spaces in the German portfolio with PV panels by 2050.

The newly formed energy innovation team, which is part of the Innovation & Business Building department, actively works to ensure that climate pathway targets are met by analyzing and testing innovative technologies. Targeted efforts have already been made to scout out new technologies at all stages of the stringent innovation process, which are then assessed for technical feasibility and economic viability with the involvement of relevant stakeholders. Particular focus is given to the testing of innovative genera-

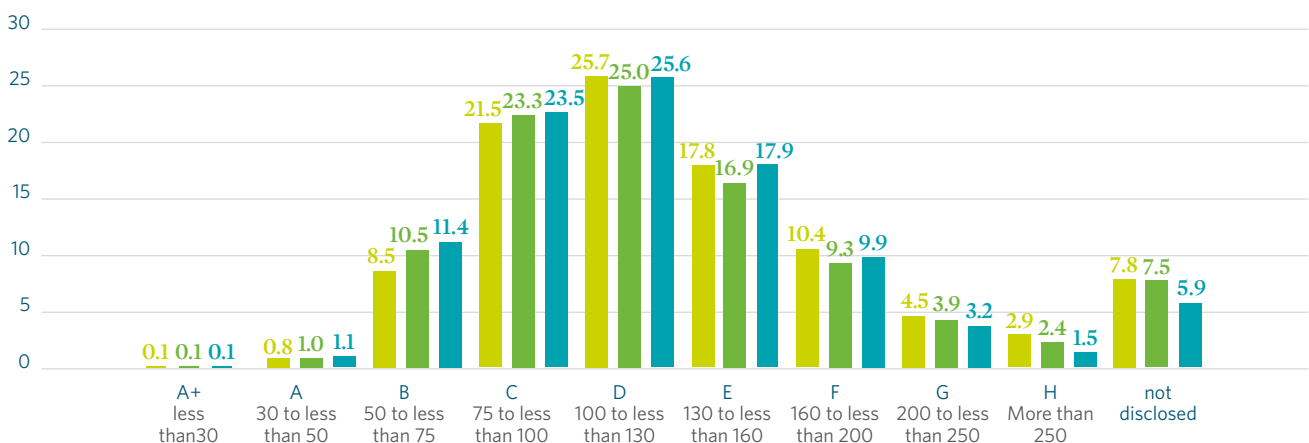
tion and storage solutions in the context of decentralized energy supplies. Vonovia is offering its customers the opportunity to purchase electricity from renewable energy sources via its own energy distribution company (VESG). By providing green energy that has been generated or certified in the neighborhood, we are supplying them with cheap electricity and helping them to reduce greenhouse gas emissions. 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. The purchase of certified green electricity to supply communal areas makes a further contribution to our climate strategy.

Decarbonizing District Heating

A further component of our climate pathway is the supply of sufficient quantities of CO₂-free district heating and electricity by the energy sector. This requires that the energy sector implement the targets set by policymakers for phasing out coal and increasing the share of renewable energies in energy or electricity generation. We consider the proposal of the German Federal Ministry for Economic Affairs and Climate Action (BMWK) on municipal heating planning to be an important step towards this goal. This can provide long-term planning security with respect to the availability of district heating within the municipalities. In this regard, adopting an integrated view of heat and electricity generation that takes all stakeholders into account is of particular importance. Wherever it is economically feasible, we are connecting more portfolio properties to the district heating grid, thus consistently advancing the decarbonization of heat generation. During the reporting year, Vonovia therefore examined the decarbonization strategies of the most important district heating providers in depth and, based on

Energy Efficiency Standards in the Portfolio (Germany) – 36.1% 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.

■ 2020 ■ 2021 ■ 2022

these conclusions, drew up potential courses of action for incorporating them into its long-term neighborhood strategy.

Exchanging views about climate protection and CO₂ reduction within the sector and beyond is important to us. We do this through, for example, Initiative Wohnen.2050 (IW.2050), where we are one of the founding members. We were also involved with a variety of exchange formats in 2022, and shared our ideas. The aim of IW.2050 is to create a shared understanding of the importance of climate change mitigation and to take a unified approach to combating climate change in the housing industry. A variety of joint guidelines, tools and dialogue formats on strategic and technical issues support this purpose. Other initiatives that we are involved with include the Stiftung KlimaWirtschaft (German CEO Alliance for Climate and Economy) and the Open District Hub (ODH) (see → [Contribution to Socio-Political Dialogue](#)).

Decarbonization Pathway in Austria and Sweden

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. As part of this initiative, BUWOG has defined the goal of achieving a reduction of 55% by 2030 compared to the baseline year of 2005. The highest share of the CO₂ reduction will be accounted for by modernization and improvements to existing stocks, particularly energy-efficient refurbishment, improvements in the efficiency of heating systems and conversion to renewable energy sources. Furthermore, all oil heating systems are to be replaced by 2030, five years earlier than required by law. BUWOG has 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 clear 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 CO₂ emissions. Therefore, the road to climate neutrality will primarily be shaped by further decarbonization of heating supply, coupled with ongoing improvements in energy efficiency. As such, the aim is to reduce energy consumption per m² by 30% by 2030 compared to 2015. In 2022, Victoriahem also joined the Swedish housing association’s “Allmännyttans klimatinitiativ”, which also aims to achieve a CO₂-free energy supply by 2030.

Sustainable Construction and Refurbishment

GRI 3-3, 302-4, 302-5, 306-1, 306-2

Our Approach

Our new construction activities are helping us to create urgently needed new and affordable homes, especially in metropolitan areas. In our new construction and refurbishment projects, we take care to ensure optimized energy design, the use of renewable energies and environmentally-aware construction methods that conserve resources. In this context, it is also of particular significance that the layouts of our buildings and developments are suitable for a wide variety of lifestyles, in addition to providing accessible homes.

A key aspect of our work in new construction and conversions is an integrated neighborhood ideal, where we pool planning skills and construction measures. For example, we create additional homes through vertical expansion and densification, thus minimizing unnecessary sealing.

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, plays a central role. 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.

In its new construction and refurbishment projects, Vonovia takes care to ensure optimized energy design and the use of renewable energies. We achieve this, for instance, by using the German efficiency house standard or the new-build criteria of the Austrian “Klimaaktiv Pakt” initiative. The average primary energy demand of newly constructed buildings, in relation to rental area, is the most important non-financial performance indicator in development. This performance indicator is part of the Sustainability Performance Index (SPI) and planning process and must be made transparent as part of all Management Board approvals of new-build and development projects.

Organizational Focus

The development business operating under the BUWOG brand is active in both 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, and the densification of buildings as part of the development of existing neighborhoods in Germany. The activities of the BUWOG development business in Germany and Austria are the responsibility of the Chief Development Officer (CDO), and the individual development projects are approved by the Management Board.

The integration of the new construction division of Vonovia Technische Service GmbH (VTS) into BUWOG Germany was fully implemented in the reporting year. Due to the continued expansion of BUWOG, we have separated our construction activities into the two BUWOG regional areas South-West and North-East with a regional manager for

Valuable Contributions to Society and the Group

Development				
1 Acquisition	2 Development	3 Planning	4 Construction	5 Marketing and Sales
<ul style="list-style-type: none"> > 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 	<ul style="list-style-type: none"> > 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 	<ul style="list-style-type: none"> > 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 	<ul style="list-style-type: none"> > Preparing for construction > Procurement and awarding of construction contracts > Trade coordination/construction management > Construction > Quality control 	<ul style="list-style-type: none"> > Development of marketing concepts > Sale > Initial rental > Customer service and aftercare

each. The purpose is to strengthen the future performance of the development business, while also boosting the local presence.

Objectives and Measures

We completed 3,749 new residential units in 2022, of which 2,071 were for our own portfolio (to hold) and 1,678 for sale (to sell).

**approx. 3,750
new apartments**

completed in 2022

Due to the rise in the cost of capital and construction, we will not be launching any new projects in 2023. The projects already under construction will be completed, as will those in planning. The latter will be prepared for a later construction start. We have set a target of completing approx. 3,450 new units in 2023. A total of around 10,000 units are currently under construction. The full potential (to hold and to sell) is considerably higher and consists of approx. 60,000 units.

In the reporting year, the average primary energy demand for new construction amounted to 37.7 kWh/m² per year. It was thus lower than that of the previous year (38.6 kWh/m² per year) and below the target for 2022, for which we had assumed a significantly higher value compared to 2021. This can be explained in particular by the early completion of a relatively large project with a low primary energy demand. We again expect to see a significantly lower primary energy

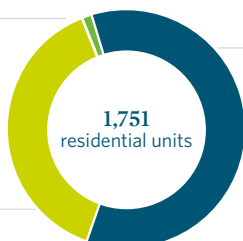
Over 98% of New Buildings Completed in Line With Efficiency Class A or Better*

Breakdown in %

1.3% >50 and ≤75 kWh/m²a (equivalent to efficiency class B)

38.6% >30 and ≤50 kWh/m²a (equivalent to efficiency class A)

60.1% ≤30 kWh/m²a (equivalent to efficiency class A+)



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

NON-FINANCIAL PERFORMANCE METRIC

37.7

**kWh/m² p. a.
average primary energy demand
in new buildings**

based on energy certificates, excluding purely commercial spaces and vertical extensions

demand in 2023 compared to 2022. By 2025, the primary energy demand should average approximately 27 kWh/m² per year.

The continual improvements in the energy performance of our new constructions is achieved in two ways: Firstly, through the combination of a high standard of insulation and mainly being supplied by district heating with a low primary energy factor. Secondly, through increased use of air-to-water heat pumps combined with photovoltaic plants. These two approaches allow us to ensure that more than 55% of the heating and warm water supply comes from renewable energy sources in some projects. In Austria we are already implementing the requirement for 2023 of not having natural gas heating in new construction projects today through our participation in "klimaaktiv Pakt 2030."

Wherever possible, Vonovia strives to revitalize existing real estate and urban usable areas, thus reusing already sealed or urbanized space and revitalizing it rather than creating new building grounds. Examples of this are the Main Au neighborhood in Hanau and the Wohnwerk in Niederschönweide, Berlin. Abandoned industrial areas are being developed into modern residential neighborhoods that also include new green spaces and biotopes. In the Münsterberger Weg project in Berlin, around two-thirds of the previously sealed area is set to be unsealed over the course of the development.

In the reporting year, resource-saving and eco-friendly construction and analysis of the entire life cycle came more to the fore. As part of our [“Perspectives on the Future of Construction”](#) (in German) dialog process, we discussed the necessary framework conditions for climate-neutral construction with representatives of the scientific community, building materials manufacturers, planners and the construction industry. We presented the results at our final conference in November (see [→ Vonovia Leads the Way to Sustainable Construction](#)) and discussed them with representatives from the world of politics. Vonovia has committed to a series of measures that will be transferred into specific implementation plans in 2023.

Comprehensive

measures for sustainable construction

adopted

Taking the entire building life cycle into consideration during the planning and assessment of our sustainability performance is a particular priority. We intend to significantly reduce the carbon footprint of our buildings and also use more sustainable and renewable raw materials, both in new construction and in modernizations.

The strategic cooperation with GROPYUS AG, announced in the reporting year, will contribute to this. Their platform-based solution for modular and prefabricated wood-hybrid construction combines saving resources with affordability. This will lead to an increase in the recyclability of constructions and building projects. We intend to promote this by introducing a key figure for recyclability and the gradual introduction of material passes for new buildings.

We will continue and expand our cooperation with our suppliers and planners, construction companies and construction material manufacturers. We intend to request sustainability data for products and take these into consideration in our tendering and awarding processes. We also want to promote innovation through competition and pilot projects in order to move from ideas to real implementation.

The dialogue process shows that policymakers in particular need to adapt the framework conditions. We are therefore calling for the harmonization and simplification of regulations, the acceleration of approval procedures for sustainable materials, higher subsidy rates for using sustainable building materials, the strengthening of centralized collection and return systems, and mandatory deconstruction concepts for new buildings.

As part of a digitalization project, we have decided to merge the skills already developed in our German and Austrian construction units and unite the synergies of both countries in terms of the building information modeling (BIM) method. The cooperation between the two countries will promote mutual learning and lead to developments being used multiple times. Based on this decision, we have set ourselves the target of creating a uniform BIM strategy for the Group. This will connect skills and the direction of the method managed centrally in a targeted manner.

Development of

Group-wide BIM Strategy

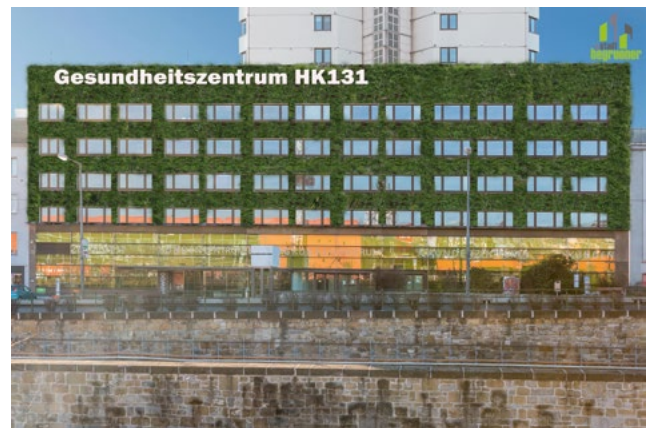
launched

Designing the residential environment and preserving biodiversity are top priorities for us. Many of our buildings feature green spaces that serve as natural habitats for flora and fauna at ground level, but also on roofs or on facades. One green facade project implemented in the reporting year is the redesign of the former BUWOG customer and administration center at Hietzinger Kai in Vienna (see [→ Green Facades at Hietzinger Kai, Vienna](#)). In addition to the optical effects, these green spaces also offer a practical added value. They increase climate resilience, for example by slowing the flow of rainwater into the partially overburdened municipal sewage system and by making a positive contribution to the microclimate by preventing urban heat islands in built-up areas. Our residential environment service only creates parking lots with seepage paving for new construction projects. We also take care to conserve resources and protect the environment during construction (see [→ Protecting Biodiversity](#)).

Green Facades at Hietzinger Kai, Vienna

As BUWOG moved to its new customer and administration center in Vienna town center, the question of how to convert the old location in Hietzing came up. “We found three appropriate successors with a modern health center, the city of Vienna and the adult education center Hietzing, who will create added value for the community,” explains Kevin Töpfer, Managing Director in charge of BUWOG’s real estate management.

BUWOG had previously completely refurbished the historical building and redesigned it according to sustainability criteria. A green facade system was established across the full front of the building, a surface amounting to 350 m², which will also look good in the winter with its high proportion of ever-greens. The full coverage will also make air conditioning the building in summer easier and reduce heat loss in winter, which in turn



Good for energy efficiency, sound-proofing, biodiversity and the look of the building; the green facade at Hietzinger Kai 131 in Vienna.

makes a significant contribution to the building’s energy efficiency. In addition to the positive effects on how the building looks and is operated, the green facade also produces oxygen and thus binds carbon dioxide. This is particularly beneficial for the high-traffic western entrance. And, finally, the greening of the building is also beneficial because it acts as soundproofing and promotes biodiversity in the area by offering animal species a new habitat.

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. This is strengthened by employer’s liability insurance associations and the German Employee Secondment Act. A security and health coordinator ensures that the requirements on construction sites are followed as closely 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. In addition to the impact of our sustainability

ambitions, this also represents an economic incentive: Using responsible waste management, we can keep costs low. That is why we include the cost of disposal in our tenders as standard in Germany and Austria.

To keep biodiversity intact in new constructions and conversions, we also implement programs 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 work closely together with the responsible authorities and professionals when implementing protection measures. Where necessary, we create replacement habitats by acquiring the necessary space for the planned compensatory planting or the resettlement of endangered animal populations.

Sustainable mobility concepts are another building block in our development activities. We promote sustainable mobility in our projects by creating numerous, low-threshold offers. One example of this is the completion of the Helio Tower in the urban development area “The Marks” in Vienna. It features a bicycle arcade that is the only one of its kind in Austria, with room for 2,000 bicycles across the site, of which 652 spots are for the Helio Tower. On average, we planned 1.8 bicycle parking spots for each newly constructed apartment. In addition, there is a car-sharing program with e-cars, city bikes and electric cargo bikes and up to 27 e-charging stations with intelligent load management just in BUWOG’s parking garage. On average, the new buildings constructed in the reporting year can be reached in around four minutes by foot from public transport (see → [Key Figures Development and New Construction](#)).

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 in construction processes. Sustainable construction methods such as modular timber or hybrid methods have a lower energy consumption and reduced carbon emissions over their entire life cycle. They are also increasingly used in our construction projects. We also largely use mineral wool for insulation, which has less of an impact on the environment than polystyrene, especially because it is more suited for recycling.

Carbon Footprint of Construction Materials

In the reporting year, we integrated the principle of life cycle assessments into our planning process. These assessments are based on our investigation of the climate impacts and the energy consumption of six construction methods over the entire life cycle – that is, from the manufacture of the construction materials to the operation and final demolition. This enables our planning departments to determine the carbon footprint of the planned development and new construction projects early on in the project planning and include this in their design. The design and implementation of proven sustainable construction projects helps us to include subsidies in the financing and achieve sustainable construction certification.

With the help of our analysis methods, we can also calculate the greenhouse gas emissions generated upstream from the materials used in the construction of our new buildings, also known as gray emissions. In 2022, this figure came to approximately 125 thousand metric tons of CO₂ equivalents.

Embodied emissions

from construction integrated
in planning process

We are also pushing for transparency on environmental impacts over the full life cycle with regard to the materials and products we use in energy modernizations. In a detailed analysis of the historical data of purchased goods, we calculated the carbon footprint for the materials and services employed and identified the relevant hot spots. They relate particularly to windows, insulation materials and heating systems. The next step involves integrating these calculations into the data systems.

Circular Economy

Another important aspect in the sustainability of materials and products is their recyclability. Vonovia is committed to using environmentally sound raw materials and production methods, as well as sustainable and recyclable construction materials. In order to lower the environmental impact of construction, more construction materials must be recycled and more construction materials must be made from recycled products. This reduces the need to produce new materials, which is intensive in terms of energy and resource.

The construction materials that we use should be reusable and highly recyclable. This means it must be possible to demolish constructions and reclaim the original components. Timber structures that are held together with screws and joints perform very well in this regard. We have partnered with Madaster – an initiative to develop a global cadastre for materials – for two years now. The online platform functions as a materials database. 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. We intend to gradually introduce these material passes for all of our new buildings.

Partner of Madaster

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

We aim to introduce recyclability as a criteria in our planning, tendering and awarding processes in the future. We intend to analyze the environmental impacts and life cycle costs (manufacture, operation, maintenance, renovation, demolition) of construction materials and products and establish the importance of circular economies in our product manual in the future.

The product manual already contains information regarding the carbon footprint and proportion of recycled materials for the products used in the design of open spaces. Pursuant to the requirements in the manual, we only use wood products that come solely from FSC-certified sources for playground equipment and insect habitats. The product manual is mandatory for our partners and application of the manual is part of the contractual agreement. We run training workshops to inform our employees in the central procurement department about the importance of sustainability in their day-to-day work and due diligence in the supply chain and their own department.

We want to push sustainable product innovations. We therefore organized an innovation competition during the dialogue process “Perspectives on the Future of Construction,” which premiered innovative materials and products. We have already used the winning materials presented in the competition to show as examples, e.g., for the construction of a daycare center in Weitmar, Bochum.

We aim to install energy-efficient electric devices during refurbishments and in new constructions while also increasing the proportion of products made of, for example, 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.

A large number of the apartments in our portfolio were not built by Vonovia. In some cases, there are materials in these buildings that were the latest technology available at the time of construction, but are now considered hazardous upon release. Potentially harmful materials, such as asbestos, “old” artificial mineral fibers (AMFs), polycyclic aromatic hydrocarbons (PAHs), or lead-based paints in existing buildings, are usually removed during maintenance or refurbishment projects or when a new tenant moves in and replaced with suitable materials. 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 employees receive regular training on these subjects.

Protecting Biodiversity

Managing a large real estate portfolio means we have an impact on the local climate and ecological environment of our neighborhoods. These neighborhoods are located in urban areas. The value of green spaces and trees is especially high in these areas, and this offers huge potential for sustainable action. We want to exploit this potential – not least to improve the quality of living for our tenants.

Our portfolio today comprises around 18.4 million m² of green space, more than 337 km of hedges and approx. 211,000 trees. The tasks associated with maintaining these areas are performed by our residential environment organization and select partner companies. Our residential environment organization, which is focused on the German portfolio, employs around 1,300 people. It is responsible for the typical maintenance of outdoor areas and implements larger gardening and landscaping projects.

The natural environment is changing: heatwaves, higher temperatures, storms and heavy rains are increasingly leading to vegetation damage and infrastructure outages. Monoculture agriculture and ground sealing are driving these developments. The result: a decrease in biodiversity and in the quality of the residential environment in the neighborhood.

We thus see it as our task to combine living quality in the residential environment in our neighborhoods with an ecological balance. Therefore, we strive to make our neighborhoods as resilient against negative climatic events as possible. With each of our measures, we are looking to find a balance between an ecologically valuable and an economically sensible solution that benefits the quality of the neighborhood.

Data Collection and Anticipation

We assess risks in the early stages of construction projects. Here, too, we have an eye on biodiversity. We perform analyses and biodiversity reports for the existing flora and fauna before each new planned construction project. The purpose of these reports is to ensure that all of the animal and plant species in an area are protected and maintained during the rest of the process. We also determine the health and conservation value of existing trees through a woodland survey.

We consider ourselves a green residential real estate company. We want to have as low an impact on the environment and climate as possible, and create added value for their protection and balance. We use forward-looking plans to ensure that aspects such as maintenance and potential future changes in climatic conditions are taken into account.

Our Promise:

1. Minimizing surface sealing!

- > No surface sealing in protected areas or areas with high levels of biodiversity
- > Construction preferentially in brownfield rather greenfield areas
- > Reduction of the use of concrete in open spaces to minimum possible and aim of using carbon-neutral concrete
- > Use of seepage paving for all newly built parking spaces

2. Preserving and promoting biodiversity!

- > Local risk assessment using species and woodland reports before all construction work
- > Creating habitats for animals in urban areas

3. Securing and protecting existing woodlands!

- > Using deadwood to create habitats
- > Compensation and replacement planting for any removals in construction
- > Planting of climate-resilient trees and shrubs

Modular System for Ecological Neighborhood Development

With our decentralized organizational structure, we respond to the local requirements on case-by-case basis. We simultaneously employ standardized and quality-assured processes. We have documented these processes in a product manual, which includes a modular system for ecological neighborhood development. It sets out the framework for implementing structural-design measures in the neighborhoods.

For instance, the product manual contains 22 area-specific seed mixes for wildflower meadows, several climate-resistant trees (e.g. field maple, common hornbeam or tree-hazel) and shrubs, seepage paving for paths and parking lots, and different drainage systems for water management. We exclusively use FSC-certified timber for playground equipment and insect habitats. We include the expertise of our product suppliers and use their information regarding the carbon footprint and recyclability of their products in order to integrate the information into our building information modeling (BIM) in open space design.

Before adding a measure to our modular system for ecological neighborhood development, we perform a qualitative development process with experts from Naturschutzbund Deutschland e. V. (NABU), Germany's largest association for biodiversity issues. Together, we investigate a number of projects, e.g. various habitat types and nesting boxes for insects, bats and endangered bird species (such as the common swift) or the vitalization of habitats in the water

collected in retention basins. Following three years of joint development and investigation work, we achieved the maximum number of habitats that could be implemented in the housing industry in our pilot neighborhood in Weitmar, Bochum. We will now let this neighborhood develop for three to four years and then reexamine the flora and fauna in this area.

We also take the neighborhood criteria of the DGNB (German Sustainable Building Council) for biodiversity (ENV2.4) and water cycle systems (ENV2.2) into consideration and already meet these standards in a number of neighborhoods.

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 also include the design suggestions and ideas that our tenants provide us with. 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 also 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 “zuhaus” on a regular basis. With the help of NABU, we have created an ecological nature trail around our headquarters in Bochum, which informs employees and visitors about the eco-friendly measures we are implementing in our residential environments.

Water, Effluents and Waste

GRI 303-5, 306-1, 306-2

Water Management

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 expect that these incidents will increase in the future – and are applying our climate risk tool, which was developed further in the reporting year (see → **CO₂ Reduction in the Housing Portfolio**), to assess the risks more accurately. 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. This potential also applies to ancillary costs. Our water management pursues the aims of lowering water consumption and using local rain and gray water.

Our standard processes contain numerous measures to minimize risk and damage. These include soil and flood surveys, which will allow us to draw up more effective water management plans for our neighborhoods. Water management is an integral part of all of our planned refurbishment and neighborhood development work. We have taken the “Rain management” planning topic into account in almost 30% of our 18 currently ongoing neighborhood developments.

Typical water management measures in the neighborhoods include the use of retention basins and areas, green roofs and facades, and drainage systems. Water from the roof drainage systems no longer runs into the public sewage system, but is collected and increasingly used for irrigation directly in the neighborhood. The increased use of seepage paving on paths and parking lots also contributes to lowering the extent to which our land is sealed and creates more space for natural ground drainage.

Our influence over the water consumption of our tenants is limited. The tenants themselves play the most important role when it comes to reducing water consumption. In addition to providing tenants with information, such as through our customer magazine “zuhause,” which is published three times a year, we also install water-saving components during modernization and refurbishment work, for example in toilets and taps. Regular functional checks and viewings in the buildings are also an opportunity to notice water leaks early on.

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. We were able to significantly reduce water consumption by relocating our customer service site from Duisburg to a new property in Essen.

Waste Management

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. 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.

Resource and Climate Protection in Business Operations

GRI 302-1, 302-4

In contrast to the manufacture of industrial and consumer goods, letting homes is not a resource-intensive business. Therefore, only a very small proportion of our greenhouse gas emissions - less than 3% - are caused by our own operations (based on Scope 1 and Scope 2). 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.

4.8%
reduction

in average carbon emissions per km driven with the vehicle fleet (against previous year)

The vehicle fleet accounts for about three-quarters of emissions from our business operations. Following the merger with Deutsche Wohnen, Vonovia had approx. 6,065 vehicles - primarily light commercial vehicles for use by our technicians and the residential environment service in Germany. 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 gradually add electric vehicles to our fleet in Austria. We have made a correction to the calculation of our emissions,

which has resulted in the journey length calculated being lower and thus the average consumption and emissions being higher than previously. We have also applied this change to the figures for 2021 (253 instead of 210 g CO₂/km). Our measures have led to a reduction in average consumption of around 3.8% (from 8.3 to 8.0 l/100 km). The average emissions fell by 4.8%. Despite an increase in the size of the fleet due to the merger with Deutsche Wohnen, the average energy consumed by the fleet has risen at a disproportionately lower level of +1.3% to 5.5% (319 vehicles).

We are not just aiming to use our resources as efficiently as possible when it comes to mobile energy consumption, but also in our offices and administration buildings. In Germany, we have a legal obligation to complete an energy audit once a year pursuant to DIN EN 16247-1. The last audit was in 2020. This includes random inspections and an examination of the energy aspects of our business operations in the buildings that we use ourselves. 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 recommendations of the energy consultant who performs the audit are forwarded as packages of measures to the Group's organizational units who then implement these at their individual locations. These include energy- and resource-saving measures such as LED lighting, using motion sensors with lighting systems or installing air heat pumps as energy-efficient heating solutions. Our IT department has introduced an automatic screen shutdown following 15 seconds of inactivity and thus implemented a recommendation from the energy audit. We are also moving towards paperless offices. We have brought the next audit forward to 2023 in order to take Deutsche Wohnen's administration buildings into account at an early stage.

We began transitioning the administration buildings that we use from our portfolio to green electricity from our own energy generation and sales division Vonovia Energie Service GmbH (VESG) in the 2022 reporting year. This initially affects around 60 sites concentrated in the South region. All of these sites are now 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 therefore intend to roll this model out to other regions.

Administration buildings that we use
from own portfolio transitioned to

green electricity

from the Group's energy
subsidiary VESG

Both our corporate headquarters in Bochum and BUWOG's central administration building in Vienna have sustainability certificates. The building in Bochum holds a DGNG Gold certificate while the building in Vienna has a ÖGNI Gold certificate. BUWOG has an ISO 50001-certified energy management system in place for all Austrian operations and the German development division.

In the field of our residential environment service, too, we were able to take another step in reducing the use of fossil fuels. The project initiated last year to make the switch from gardening equipment with combustion engines to more environmentally friendly battery-powered equipment was continued in the reporting year. Around 1,500 battery-powered tools are now in use. 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. We have decided to expand our product range in 2023 and test mobile charging options.

Around 1,500 battery- powered tools

in use in the Residential Environment Service



Rolf Buch, Daniel Föst (Member of the Bundestag, FDP), Timo Schisanowski (Member of the Bundestag, SPD), Kassem Taher Saleh (Member of the Bundestag, Bündnis 90/Die Grünen) and Konstantina Kanellopoulos in a panel discussion on approaches to finding sustainable solutions and future political demands in urban and housing construction

Vonovia Leads the Way to Sustainable Construction

How could new buildings be constructed in a more climate friendly and sustainable way in the future? This was the main question asked in the sustainable construction dialogue process organized by Vonovia: [“Perspectives on the Future of Construction”](#) (in German). The dialogue process started with a kick-off meeting in March 2022 and brought together representatives from the fields of industry, research and politics. On November 23, 2022, the symposium closed the series of events at the Futurium Berlin with approximately 300 attendees. The limelight was on the solutions that had been developed together. Working groups with participants from our departments had been working on innovative approaches to various focal points together with industry experts and the Fraunhofer Institute in an intensive process since the spring. In the future, these will be turned into specific measures and targets. Specific demands were also made of politicians to encourage sustainable construction.



A Selection of Our Approaches to Sustainable Construction

- > Increasing the proportion of renewable and sustainable construction materials through serial and modular construction methods
- > Formulating a company-wide target for life-cycle emissions in new construction and the modernization of existing stock
- > Further development of calculation tools to calculate the recyclability of construction materials
- > Digitalization of the housing stock with the aim of improving recyclability and optimized maintenance as well as longer management periods and improved dismantling options including innovative solutions to minimize organizational expenditure
- > Launch of a skills and information campaign on alternative construction materials and methods
- > Training offers on specific topics for Vonovia employees

