



# The Future of Low-carbon Housing

ESG Webinar hosted by Morgan Stanley

November 9, 2020



## Urbanization

An increasing part of the population is moving into urban areas

**We are providing apartments at fair price levels to a growing urban population**

Our products and services give more than one million people an affordable home in their apartment and neighborhood



## Energy efficiency

Ca. 1/3 of greenhouse gas emissions are related to real estate

**We are a driving force of the industry and have embarked on a climate path that will result in a CO<sub>2</sub> neutral portfolio by 2050**

The energy-efficient modernization of the housing stock and innovative solutions for carbon neutral residential neighborhoods are paramount for achieving climate protection targets



## Demographic change

An increasing share of the population is 65+ years

**We are preparing at one third of all apartments that become vacant for elderly tenants**

Demographic changes require refurbishing apartments to enable an ageing population to stay in their homes with little or no assistance for longer

**Our scale, sustainable business model and access to capital markets enable us to assume a leading role in our industry for finding and implementing solutions.**

### ESG Ratings



**Gold Award** for three consecutive years



2016



2017



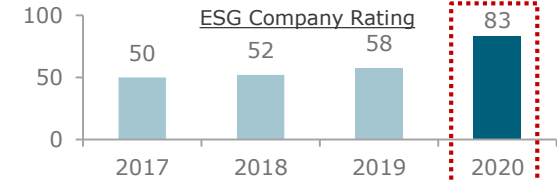
2018/19



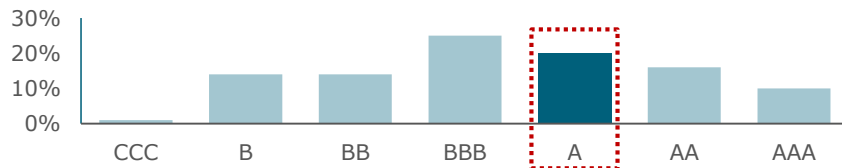
2020



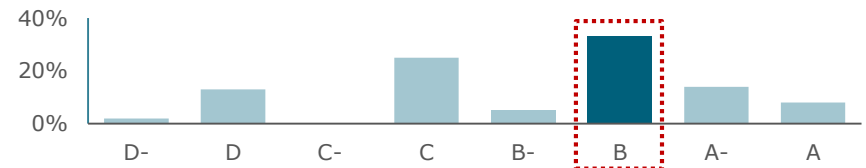
**Upgraded** in both ratings in 2020; Risk rating within 1st percentile of global rating universe



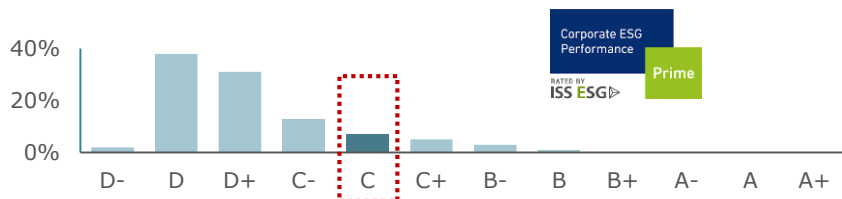
**Upgraded** from BBB to A



**Upgraded** from C to B



**Upgraded** from C- to C



G R E S B

No participation in 2020. See Vonovia's open letter at <https://investors.vonovia.de/websites/vonovia/English/4080/news-detail.html?newsID=2024595&type=corporate>

Constructive dialogue with GRESB to try and enable participation going forward

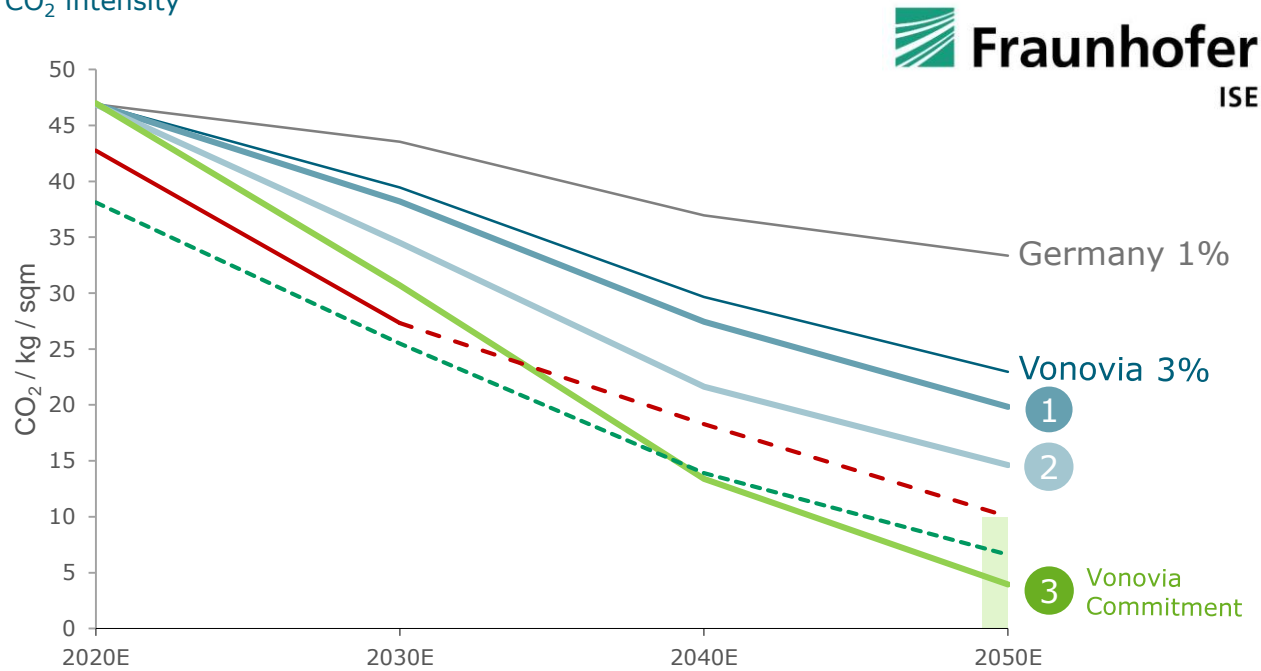
### ESG Indices

Vonovia is a constituent of various ESG indices, including the following: DAX 50 ESG, STOXX Global ESG Leaders, EURO STOXX ESG Leaders 50, STOXX Europe ESG Leaders 50.

# Vonovia's Climate Path towards CO<sub>2</sub> Neutrality through Continued Modernization, Renewable Energy and Sector Coupling

Illustration of different climate path scenarios 2020-2050

CO<sub>2</sub> intensity



- Energy efficient modernization rate Germany (1%)
- Energy efficient modernization rate Vonovia (3%)
- -60% reduction, 3% energy efficient modernization rate
- -60% reduction, 3% energy efficient modernization rate + gas condensing & solar thermal technology
- -60% reduction, 3% energy efficient modernization rate + proprietary district heating, sector coupling / or + heat pump / or + PV
- - - Target path of German government 2030 / scenario for climate neutral housing portfolio
- - - CRREM 2-degree path 04/2020
- Target corridor

**1 Base case**  
Increased modernization depth (ca. 60% reduction)

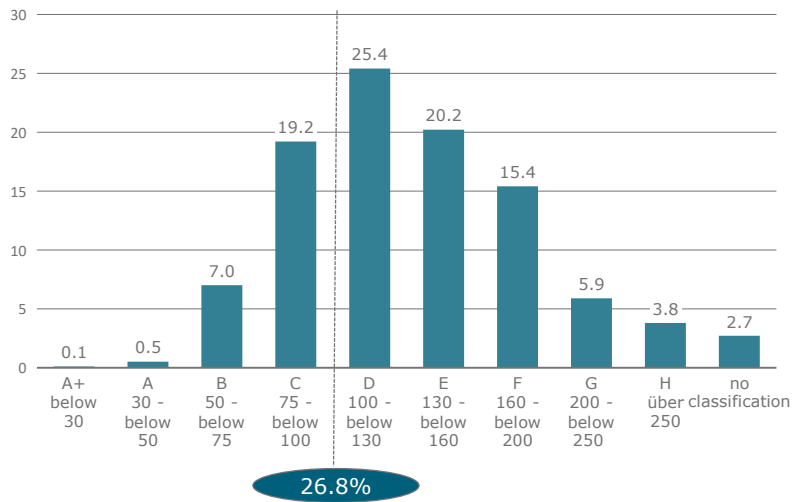
**2 Hybrid case**  
Increased modernization depth (ca. 60% reduction) + gas condensing + solar thermal technology

**3 Climate neutral case<sup>2</sup>**  
Conversion to green district heating, sector coupling and renewable energy (heat pump / PV)

Note: This climate path refers to the German portfolio; we are in the process of developing separate climate paths for the portfolios in Austria and Sweden. Source: Fraunhofer ISE modelling of Vonovia portfolio. Reduction of energy need of 160 kWh towards 60% through the following measures: Building envelope (insulated facade, windows) to become KfW Standard 100-70; scenarios 2 and 3 include the simulation of a change of energy sources. <sup>2</sup> In order to achieve the climate neutral case certain regulatory adjustments still need to be made and not all of the technological concepts have been fully developed yet.

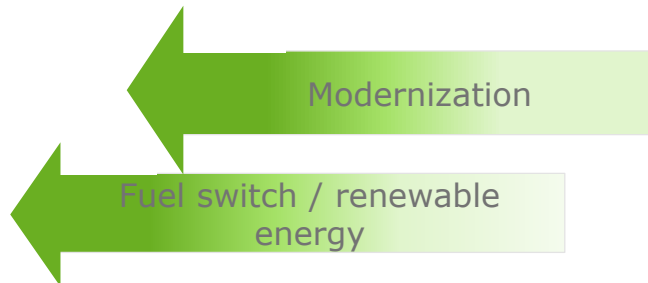
## Vonovia Portfolio - Energy Efficiency Classes

Portfolio in %. Energy efficiency classes (kWh(m<sup>2</sup>\*a)) 2019



## Vonovia's Climate Strategy

- Energy-efficient modernization of ca. 3%
- Continue building modernization with even greater depth (up to 60%)
- Additional efficiency gains from fuel switch & renewable energy:
  - Green district heat
  - New technologies
  - Sector coupling in the neighborhood (PV & mobility)
- New construction: CO<sub>2</sub> optimized, use of renewable energy (energy efficiency class A and better)



### Existing technologies

- Continue energy efficient building modernization with a 60% reduction rate for post-refurbishment energy need
- Replacement of oil heating systems with gas condensing boilers
- Hybrid heating (combination of condensing boilers and solar, renewable)
- Heat pumps
- Green district heat
- Sector coupling

### Innovation for CO<sub>2</sub>-neutral Heat Generation

#### Tomorrow's Energy Center

- Construction of a proprietary research center in Bochum Weitmar to develop renewable energy systems
- Integration of technologies such as fuel cells, electrolyzer, etc.
- The objective is to evaluate different technologies in terms of economic and ecological impact with a view to roll them out in other neighborhoods of our portfolio



#### Energiesprong – Serial Refurbishment

- Concept for cost-neutral modernization by combining serial refurbishment and the integration of renewable heat and electricity
- First pilot in Bochum about to be implemented;
- Additional pilots planned until 2024



#### Pellet Heating Project

- Pellet heating is almost climate neutral
- Particularly suitable in connection with local district heating
- Pellet costs are similar to gas costs; heating plants are more expensive
- When subsidized, pellet heating is a viable ecological and economically feasible alternative
- First concepts for potential pilots underway



#### Hydrogen Technology






- Decentralized generation of green hydrogen via PV
- Areas of application:
  - Hydrogen storage for subsequent heat generation
  - Disposal of hydrogen
- Technology currently still too expensive; a growing market is expected to lead to substantial cost reductions, rendering H<sub>2</sub> economically feasible



# Five Areas of Action to Achieve CO<sub>2</sub>-neutral, Energy-autonomous Neighborhoods for a Decentralized Energy Revolution



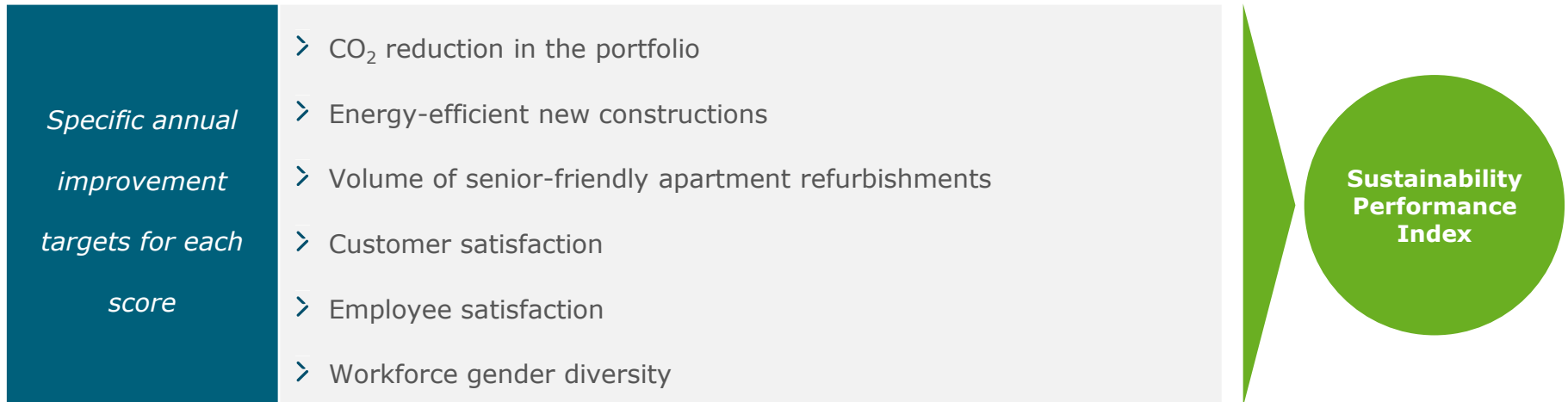
As a leader for climate protection in the residential sector Vonovia hosted the climate conference "Outlook for Climate-neutral Living" in Berlin on October 1, 2020.

				
Renovation rate	Renewables	System change	Mobility	Stakeholders
<ul style="list-style-type: none"> <li>➢ Increase renovation rate and enable <i>Energiesprong</i> (energy efficiency leap) through high-quality, swift, and affordable renovation</li> <li>➢ Spread between gas and electricity needs to be further reduced to enable electricity-based, low CO<sub>2</sub> heat supply</li> </ul>	<ul style="list-style-type: none"> <li>➢ Include landlord-to-tenant electricity in recoverable expenses</li> <li>➢ Resi sector needs to be included in national Hydrogen Strategy</li> </ul>	<ul style="list-style-type: none"> <li>➢ Accelerate conversion of the electrical energy system</li> <li>➢ Modify regulation to support decentralized electricity production</li> <li>➢ Promote new energy markets for the financing of flexible electricity generators</li> </ul>	<ul style="list-style-type: none"> <li>➢ Accelerate charging infrastructure and market availability of e-vehicles through tailored subsidy programs for resi sector</li> <li>➢ Establish standards for technical connection needs of grid operators plus grandfathering clause for installing charging stations</li> </ul>	<ul style="list-style-type: none"> <li>➢ Simplify landlord-to-tenant electricity models in resi sector</li> <li>➢ Raise awareness why we need energy transition</li> <li>➢ Facilitate landlord-to-tenant electricity in multifamily housing</li> </ul>

**Three essentials**

- Continued modernization rate
- Adequate subsidy regime
- No grid fees or surcharges on decentralized and self-generated electricity

- Vonovia is in the process of developing and implementing a Sustainability Performance Index with quantitative, non-financial KPIs and medium-term targets until 2025.



<b>Next steps</b>	<b>12/2020</b>	Supervisory Board to decide on new management remuneration scheme to be presented to the 05/2021 AGM for approval
	<b>03/2021 (FY 2020 results)</b>	Updated Management System and reporting of 2019 and 2020 actuals plus 2021 guidance
	<b>04/2021 (2020 Sustainability report)</b>	Sustainability Performance Index roadmap and targets for 2025
	<b>05/2021 (AGM)</b>	Resolution on new management remuneration scheme





Renovation Wave will address decarbonization & renovation rates and tackle the underlying barriers for improving energy efficiency.

The Objectives are to contribute to EU climate targets by

- New Target 55% CO<sub>2</sub> Reduction by 2030 (against 1990);
- 35 million building units renovated by 2030;
- At least doubling the annual rate of energy-efficient renovations of currently 1% of residential and non-residential buildings by 2030 and fostering deep energy renovation;
- Creating up to 160,000 green jobs in the building sector until 2030.

EU approach	Benefits	Challenges	Vonovia position
<ul style="list-style-type: none"> <li>› Doubling modernization rate (to 2%): accelerate modernization by 2030</li> </ul>	<ul style="list-style-type: none"> <li>› Major economic recovery plan</li> <li>› Necessary to be compliant with Paris Climate Accord targets</li> </ul>	<ul style="list-style-type: none"> <li>› Cost-intensive and only feasible for large companies</li> <li>› Vonovia is at 3% modernization rate</li> </ul>	
<ul style="list-style-type: none"> <li>› Combination of modernization &amp; fuel switch</li> </ul>	<ul style="list-style-type: none"> <li>› Accelerated integration of renewable energies</li> </ul>	<ul style="list-style-type: none"> <li>› Integration of decentralized renewable energy systems</li> </ul>	
<ul style="list-style-type: none"> <li>› Expansion of decentralized renewable energies</li> </ul>	<ul style="list-style-type: none"> <li>› Real estate industry as producer and supplier of decentralized renewable energy: new markets</li> <li>› No fee on self-regenerated renewable energies</li> </ul>	<ul style="list-style-type: none"> <li>› Obstacles in German legislation, e.g. landlord-to-tenant electricity and accounting for “green” electricity in building sector</li> <li>› Reduction of grid fees and charges especially for decentralized energy</li> </ul>	
<ul style="list-style-type: none"> <li>› Focus on neighborhood/ sector coupling</li> </ul>	<ul style="list-style-type: none"> <li>› Enables decentralized energy system transformation by creating synergies and efficiency gains</li> </ul>	<ul style="list-style-type: none"> <li>› Electrification of heating market will be challenging: needs technology openness and technology leaps</li> </ul>	
<ul style="list-style-type: none"> <li>› Expand funding opportunities / access to public subsidies</li> </ul>	<ul style="list-style-type: none"> <li>› Ensures socially acceptable climate protection (affordable for tenants)</li> </ul>	<ul style="list-style-type: none"> <li>› Usability/enabling access also for large companies, hurdles of subsidy law and government aid regulation</li> <li>› Simplified access necessary</li> </ul>	
<ul style="list-style-type: none"> <li>› Stricter regulations and minimum energy performance standards</li> </ul>	<ul style="list-style-type: none"> <li>› Change in EPC requirements (<i>Energieausweise</i>) and better comparability</li> <li>› Focus on CO<sub>2</sub>-intensity, not only on energy</li> </ul>	<ul style="list-style-type: none"> <li>› Additional red tape (minimum requirements; digital logbooks etc.) slows down and complicates the process</li> </ul>	

Source: [https://ec.europa.eu/energy/sites/ener/files/eu\\_renovation\\_wave\\_strategy.pdf](https://ec.europa.eu/energy/sites/ener/files/eu_renovation_wave_strategy.pdf)

## EU Strategy on Sustainable Finance

Green Bond Standards

VNA is monitoring the criteria of Green Bond emissions/ standards  
 Relevant criteria for the Green Bond Standard can be aligned with Vonovia Portfolio:

- New construction: Prime energy demand must be lower than 20% than national net-zero-energy-building (NZEB) defined by GEG / EnEV 2016
- Existing building belongs to the top 15 % of the local existing stock (Primary Energy Demand of the building must be within the top 15%<sup>1</sup>) / Renovated buildings - Efficiency  $\geq$  30 % better after renovation

NFRD Reporting Initiative

Requirements to report non-financial information in annual report for large listed property companies

- VNA committed to comprehensive non-financial reporting, including non-financial declaration in annual report
- No need for a new or separate European Reporting Standard; better to improve existing reporting standards (like NFRD/German CSR-RUG, GRI, TCFD, International Accounting Standards IAS)

<sup>1</sup> Linked to local EPC / Definition of local Stock - Proxy Efficiency class B to C.

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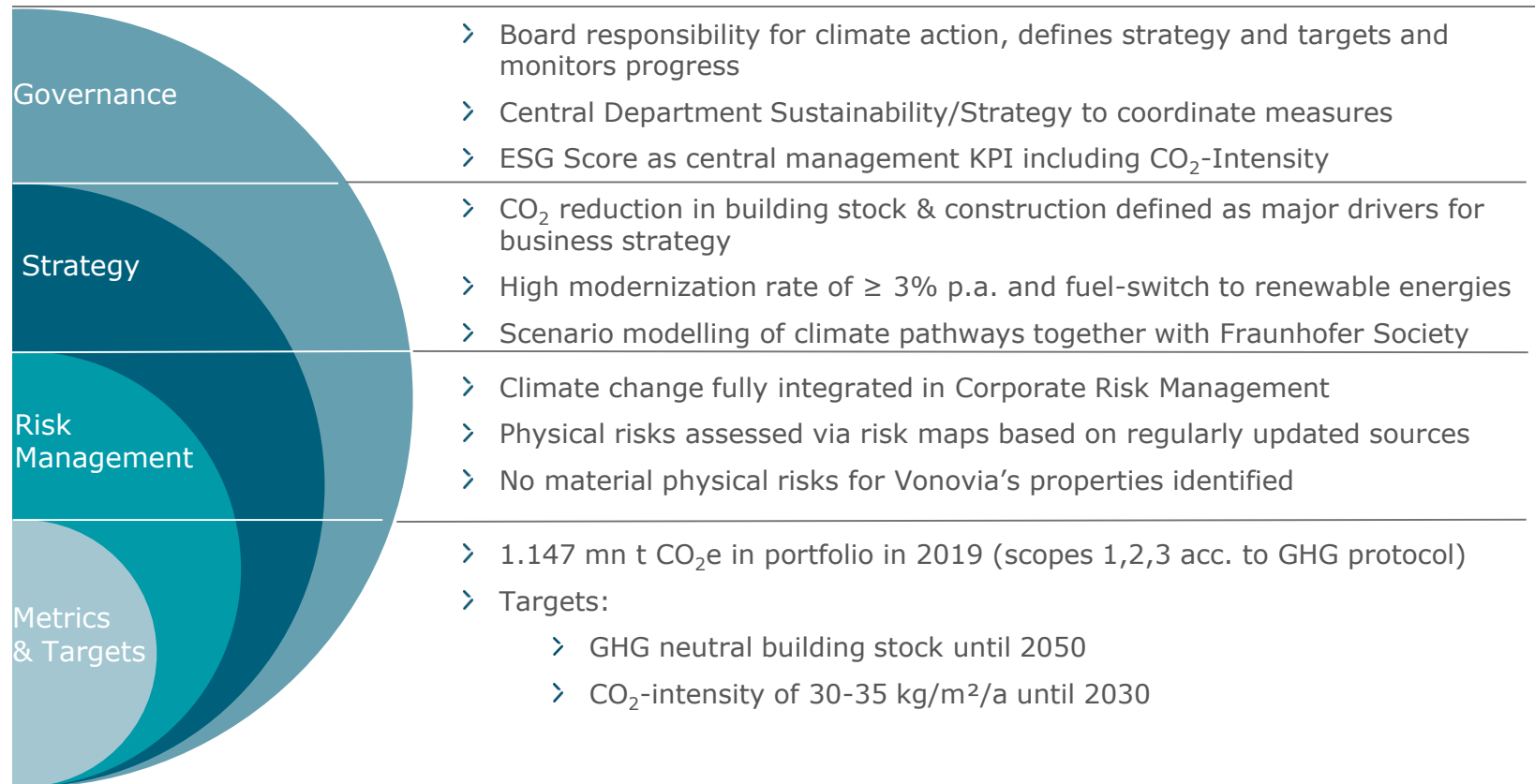


- In partnership with renowned Fraunhofer institutes, Vonovia is implementing a three-year hands-on innovation project as part of Open District Hub e. V. in our neighborhood in Bochum-Weitmar to develop and test new technologies in ongoing operations.
- The aim of the project is to supply the neighborhood with electricity and heating that is as carbon-neutral as possible. We aim to achieve this by linking the energy sectors via a central platform.
- A smart, self-learning energy management system then ensures that the right energy is distributed to tenants when they need it – at electric charging stations, in the form of electricity for tenants’ own households or in the form of heating.

Level	Measure
Apartment	1 Implementation of measures that do not involve any structural intervention, e.g., optimized heating system settings
	2 Digitalization of buildings and apartments, e.g., to feature smart meters
Building	3 Energy-efficient refurbishment, e.g., measures relating to the building shells and heating systems
	4 Infrastructure for e-mobility, e.g., charging stations and e-wall sockets
	5 Sustainable energy supply, e.g., photovoltaic systems for tenant electricity
Neighborhood	6 Building digitalization and networking
	7 Sector coupling (heat, electricity, mobility, etc.) in the neighborhood via digital platform
	8 Storage and distribution of energy generated in a decentralized structure enables on-site consumption
	9 Promotion of biodiversity



# Vonovia's Approach to Climate Action Reflects the Recommendations of TCFD



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