



VONOVIA

First Assessment of the European Union's Energy Performance of Buildings Directive (EPBD)



December 20, 2021

EU Energy Performance of Buildings Directive (EPBD)

Background

- On December 15, 2021, the European Union Commission published a proposal for a directive on the energy performance of buildings, aiming to make homes and buildings fit for a greener future.
- The directive is part of the Commission's "Fit for 55" proposals to deliver on the European Green Deal and the European Climate Law.
- It complements other components and sets the vision for a climate neutral building stock by 2050.
- The directive will impact national regulatory frameworks and shape member states' approach to make their national building stock more energy efficient.

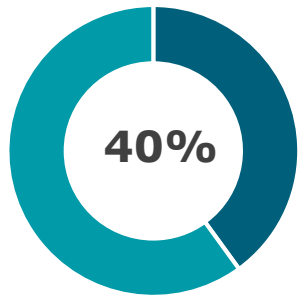
¹Source: European Commission (https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6683).

EU Energy Performance of Buildings Directive (EPBD)

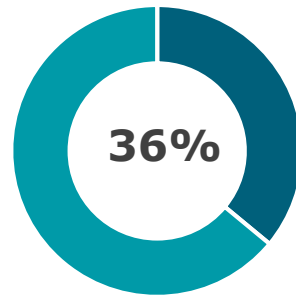
The EU is Getting Serious about the Relevance of Buildings in the Fight Against Climate Change

The urgency is obvious...

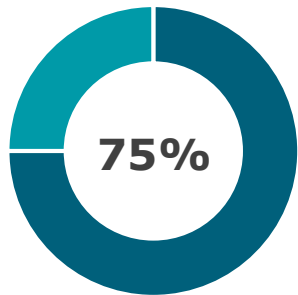
Buildings account for



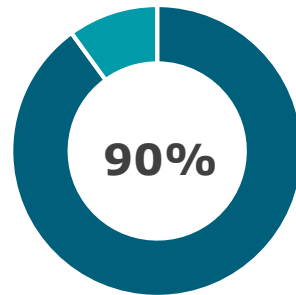
of energy consumed



of energy-related
greenhouse gas emissions



Of EU buildings are not
energy efficient



Of EU buildings are
expected to still be standing
in 2050

...and the EU is taking action

- ! At the current pace the decarbonization of the building sector would require centuries. Triggering and supporting building renovation, including a shift towards emissions-free heating systems is therefore a key goal.
- ! Member states need to develop a national building renovation plan for a highly energy-efficient and decarbonized building stock by 2050.
- ! By 2030 all *new buildings* must be zero-emission¹ and not cause any on-site carbon emissions from fossil fuels.
- ! 15% of worst performing [*existing*] buildings must be upgraded to energy performance certificate class F by 2030 and E by 2033.²
- ! Energy performance certificates (EPCs) based on energy need will be required for all selling and letting starting 2026.

Source: European Commission. ¹ For new constructions zero emission is defined as ≤60 kWh/sqm p.a. (Germany); ≤65 kWh/sqm p.a. (Austria); ≤75 kWh/sqm p.a. (Sweden) provided that the building causes no on-site carbon emissions from fossil fuels. ² EU requires harmonization of member states' energy performance standards by defining the lowest energy performance class G as the worst performing 15% of the building stock, with zero-emission buildings defined as A. The categories in between are to be defined based on overall EU guidelines with a view towards harmonization across member states.

Changes for New Constructions and Harmonization of EPCs

Highest Requirements for New Builds; Energy Performance Certificates Required 2026 Onwards

EU requirement

New Construction

Until 2030, all new buildings must be *nearly zero-emission buildings*.¹

Starting 2030, all new buildings must be *zero-emission buildings*.²

A new construction is considered a *zero-emission building* if the remaining energy need is ≤ 60 kWh/sqm p.a.³ and if the building causes no on-site carbon emissions from fossil fuels.

Energy Performance Certificates (EPCs)

Energy performance certificates (EPCs) will be required for all selling and letting starting 2026. Different energy efficiency classes in the member states are to be harmonized by the end of 2025.

Energy efficiency class G: The worst 15% of a country's housing stock. Energy efficiency class A: zero-emission building. Energy efficiency classes B-F: even bandwidth distribution.

Energy performance certificates are to be based on energy need.

Vonovia

- ✓ All of Vonovia's current and future new constructions are already compliant.
- ✓ The average primary energy need of new constructions in 2020 was 35.7 kWh/sqm p.a.

- ✓ EPCs are already mandatory in Germany.
- ✓ >80% of Vonovia's EPCs already compliant.⁴
- ✓ The remainder is based on energy consumption.

Source: European Commission. ¹ Buildings with a very high energy performance where the nearly zero or very low amount of energy required is covered to a very significant extent by energy from renewable sources. ² Buildings with a very high energy performance where the very low amount of energy still required is fully covered by energy from renewable sources. ³ The European divides its member countries into different climatic zones and allows for different thresholds for these zones. For new constructions zero emission is defined as ≤ 60 kWh/sqm p.a. (Germany); ≤ 65 kWh/sqm p.a. (Austria); ≤ 75 kWh/sqm p.a. (Sweden) provided that the building causes no on-site carbon emissions from fossil fuels. ⁴ Based on final energy need, not primary energy need.

EU Requirements for Existing Buildings

EU Places Great Emphasis on Renewable Energy for Decarbonizing Buildings

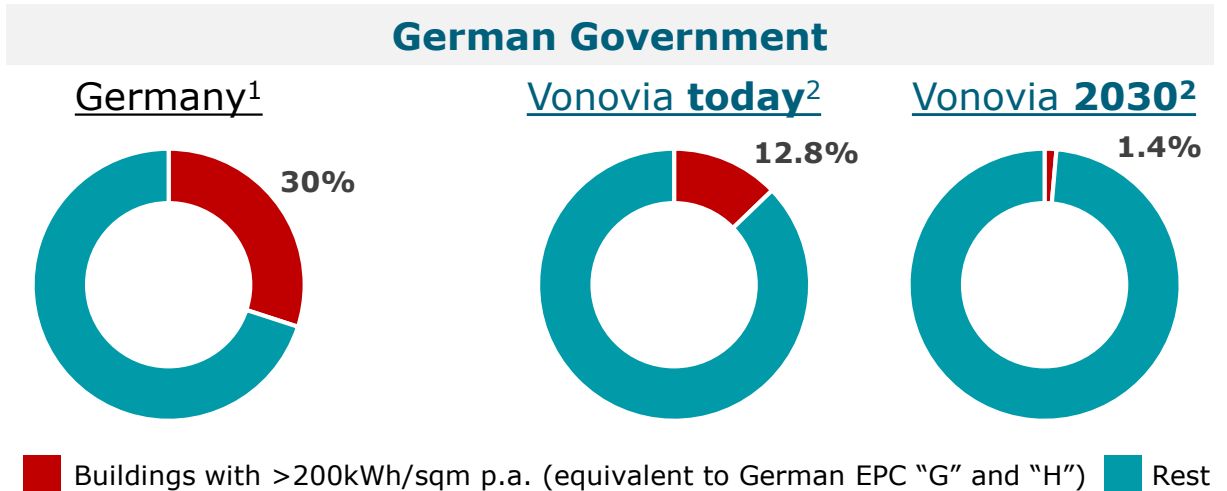
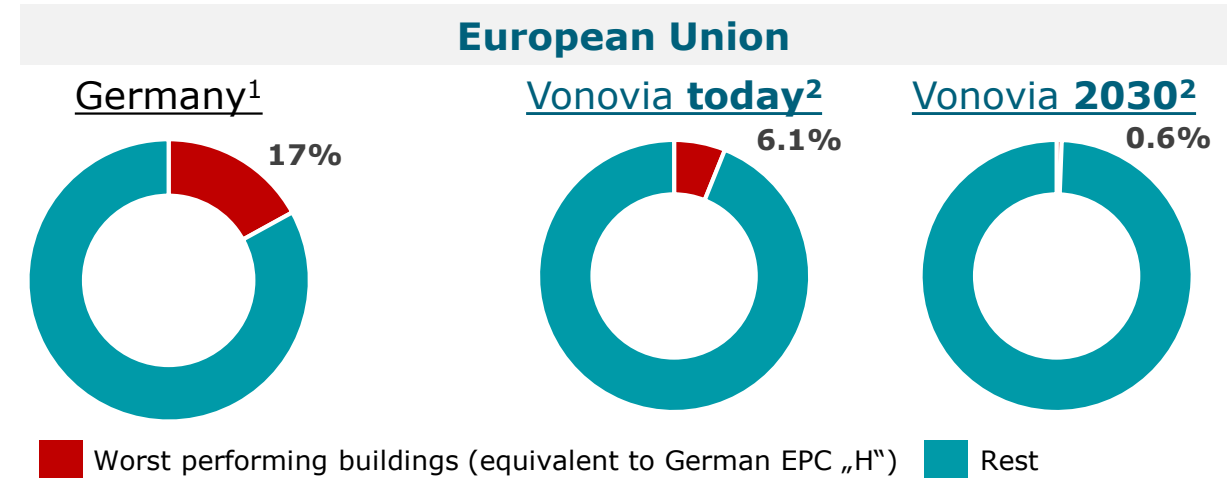
- *Nearly zero-emission building (NZEB)*: A building with a very high energy performance where the nearly zero or very low amount of energy still required is covered to a very significant extent by energy from renewable sources.
- *Zero-emission building (ZEB)*: A building with a very high energy performance where the very low amount of energy still required is fully covered by energy from renewable sources.
- Member states are required to harmonize energy performance standards as follows: the lowest energy performance class G shall cover the worst performing 15% of the building stock, and zero-emission buildings are to be defined as energy performance class A. The categories in between shall be defined based on overall EU guidelines with a view towards harmonization across member states.
- Residential buildings must achieve at least energy efficiency class F by 2030 and class E by 2033. *Deep renovation* should be defined as a renovation that transforms buildings into zero-emission buildings, and, in a first step, as renovation that transforms buildings into nearly zero-emission buildings.
- Member states need to establish specific timelines for buildings to achieve higher energy performance classes by 2040 and 2050, in line with the pathway for making the national building stock climate neutral.

With the EPBD the EU recognizes that climate change in the building sector will need to be based on a two-step approach: (1) energy efficient modernization of buildings (“deep renovation”) and (2) fuel switch, replacing fossil fuels with renewable energy, supporting the strategy on which Vonovia’s climate path is based.

Consequences for Vonovia's Portfolio

Vonovia Is Better Positioned than the German Average and Fully on Track for 2030 Compliance

- The share of the portfolio impacted depends on whether the classification will be based on
 - the European Union (Worst performing 15% of a nation's housing stock) or
 - the current classification of the German government's Long Term Renovation Strategy (Buildings with an energy need > 200kWh/sqm p.a.)
- ✓ Because of the comprehensive energy-efficient modernization investments since the IPO, Vonovia's portfolio is already better positioned than the Germany average.
- ✓ Vonovia's climate path safeguards compliance with both the EU and the German targets.
- ✓ Implementing the climate path with energy-efficient modernization ("deep renovation") and fuel switch will ensure that by 2030 Vonovia's portfolio will be compliant. The remaining 0.6% or 1.4%, respectively, will be solved through adjustments to the climate path.



¹ Source: dena [German Energy Agency], ifeu, Prognos, Öko-Institut, Navigant, adelphi (2019): Vorbereitende Untersuchungen zur Erarbeitung einer Langfristigen Renovierungsstrategie nach Art 2a der EU-Gebäuderichtlinie RL2018/844 (EPBD), August 2019. ² German portfolio.

EU European Performance of Buildings Directive

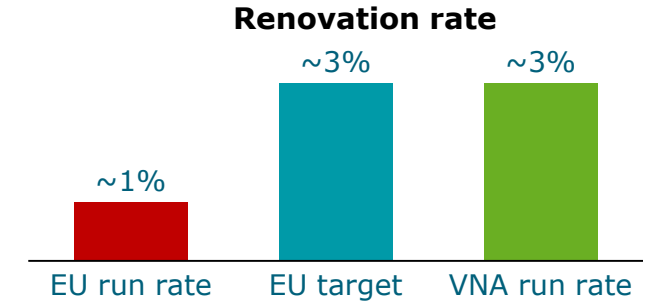
Why the EPBD is Positive for Vonovia

Headstart

The comprehensive annual investment program that we have been executing since the IPO has put us on the front foot and ensured that we are already on a renovation path that the EU is now urging its member states to develop and commit to.

Our climate path that we embarked on in 2020 has anticipated the EU efforts and made us a frontrunner for the EU's objective to increase renovation, modernization and decarbonization of the EU's building stock.

Implementing the climate path with energy-efficient modernization ("deep renovation") and fuel switch will ensure that by 2030 Vonovia's portfolio will be compliant. The remaining 0.6% or 1.4%, respectively, will be solved through adjustments to the climate path.



Renewables are key

The EU calls for certain thresholds in terms of energy requirements that buildings must meet in the future. The remaining energy need must then be supplied through renewables, highlighting the enormous importance of renewable energy.

Vonovia has been rigorously pursuing research and development activities to generate, store and provide renewable energy to tenants locally. Our 30,000 roof program to equip all suitable Vonovia roofs with PV installations and our Energy Plant of the Future in Bochum-Weitmar are only two examples how we are leading the way to work towards a fuel switch, away from fossil fuels and to provide the remaining energy after modernization through PV, heat pumps, hydrogen and other renewable energy concepts.

Comprehensive funding available

Executing energy-efficient renovation of (i) 15% of the EU's buildings until 2027 or 2030, respectively,¹ and (ii) beyond that in a still-to-be-determined roadmap towards a climate neutral building stock by 2050 is a herculean task, also financially. The EU has committed to provide substantial funding (e.g. Recovery and Resilience Facility, Social Climate Fund, InvestEU Fund) and urges members states to make use of the funding without substituting national measures.

Stranded assets in the market

The increasing focus on decarbonization and the inability of many owners to manage the challenges ahead will most likely lead to stranded assets and create opportunities for companies that successfully manage the transition to climate-neutral buildings.

Source: European Commission. ¹ Energy performance class F by 2027 for buildings owned by public bodies and non-residential buildings; 2030 for residential buildings.

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