

Role of deep renovation of buildings in meeting the EU energy and climate targets – EPBD perspective

streamSAVE+ Dialogue Meeting #08

Streamlining Energy Savings Calculations Energy savings
from deep renovations of Buildings

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Dr Susanne Geissler

s.geissler@sera.global | <https://sera.global> | [LinkedIn](#)

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SERA Institute

- SERA is a boutique research and consultancy firm specialising in sustainable energy and resources
- Recent and current relevant activities in the building sector, particularly in support of the implementation of the **Energy Performance of Buildings Directive (EPBD)**:



- CA EPBD 6 – Subcontractor to OIB as the Austrian national coordinator



- easySRI – Partner



- EPBDwise – Partner

EPBD – Energy Performance of Buildings Directive (EU) 2024/1275

This Directive promotes the improvement of the energy performance of buildings and the reduction of greenhouse gas emissions from buildings within the Union, **with a view to achieving a zero-emission building stock by 2050**, taking into account the outdoor climatic conditions, the local conditions, the requirements for indoor environmental quality, and cost-effectiveness (Article 1 Subject matter)

- Requirements for **new buildings**
- Targets for the **renovation of the building stock**
- Many **instruments**: Energy Performance Certificate (EPC), Renovation Passport (RP), Smart Readiness Indicator (SRI), Inspection of Heating and Cooling Systems, National Building Renovation Plan (NBRP)

The evolution of the EPBD

- 2002 → recast 2010 → amending directive 2018 → recast 2024
- The objective remains the same, but the requirements are becoming more detailed over time.
- In 2018, new instruments were added (RP, SRI, LTRS), which were regulated in more detail with the recast 2024. The Long-Term Renovation Strategy (LTRS) has evolved into the National Building Renovation Plan (NBRP).
- In 2024, provisions were added regarding data and related aspects.

Evaluations have shown that more effort is needed to improve the energy efficiency of buildings. In particular, the renovation rate is too low at around 1%.

Buildings account for 40 % of final energy consumption in the EU and 36 % of its energy-related GHG emissions while 75 % of Union buildings are still energy-inefficient.

Regulation (EU) 2021/1119 (“Climate Law”) establishes the target of economy-wide climate neutrality by 2050 at the latest and establishes a binding EU domestic GHG reduction commitment.

Reference to EED

The EPBD repeatedly refers to the EED in relation to the following aspects:

- Energy efficiency first principle
- Public bodies
- Split incentives
- Energy poverty
- Energy performance contracting
- Energy from an efficient district heating and cooling system
- One-stop-shops
- Qualification of independent experts and building professionals
- Primary energy factors
- Several provisions regarding financing of energy efficiency measures

Deep renovation and zero-emission standard

Recital (45) [...] *deep renovation should be defined as a renovation that transforms buildings into **zero-emission buildings** but, as a first step, as a renovation that transforms buildings into **nearly zero-energy buildings**.*

1. Reducing transmission losses through the building envelope
2. Supplying the remaining energy demand with renewable energy sources

[...] A deep renovation for energy performance purposes may also be a prime opportunity to address other aspects such as indoor environmental quality, climate resilience [...]

The renovation passport contains a building-specific renovation roadmap to exploit the full potential of improvement opportunities.

Building specific approach (bottom-up)

Energy Performance Certificate (EPC) (Article 19, Annex V)

- Calculated energy consumption based on standard user profile
- Compare building energy performance irrespectively of user behaviour; inform potential tenants or buyers about the energy performance of buildings on the property market

Renovation Passport (RP) including renovation roadmap (Article 12, Annex VIII)

- Actual / metered energy consumption; estimated savings on energy bill
- Develop building specific renovation measures in the correct sequence (with renovation roadmap to avoid lock-in effects) to achieve zero-emission standard by 2050

“EPC database” - National database for the energy performance of buildings (Article 22)

Indicators and data

- **Energy performance of a building** means the **calculated or metered amount of energy needed** to meet the energy demand associated with a typical use of the building, which includes energy used for heating, cooling, ventilation, domestic hot water and lighting.
- The **energy performance certificate** shall display at least the following elements: (a) the energy performance class; (b) the calculated annual primary energy use and final energy use in kWh/(m² .y); [...] the calculated annual primary and final energy consumption in kWh or MWh [...]
- The **renovation passport** shows the estimated energy savings in primary and final energy consumption, in kWh and in percentage improvement compared to the energy consumption prior to the step, [...] the estimated savings on the energy bill, clearly indicating the assumptions on energy costs used for the calculation [...]
- **Primary energy** means energy from renewable and non-renewable sources which has not undergone any conversion or transformation process.

Article 22 Databases for the energy performance of buildings

- Data to be gathered from **energy performance certificates, inspections, renovation passports, the smart readiness indicator and the calculated or metered energy consumption** of the buildings covered.
- **Publication of data**; public information shall be updated at least twice per year.
- At least once per year, Member States shall ensure **the transfer of the information in the national database to the EU Building Stock Observatory (BSO)**.
- Database must be **interoperable and integrated with other administrative databases** containing information on buildings, such as the national building cadastre or land registry and digital building logbooks.

EU Building Stock Observatory ([BSO](#))

The EU Building Stock Observatory is a **Web tool to monitor the energy performance of buildings** across Europe.



COMMISSION IMPLEMENTING REGULATION (EU) 2025/1328 of 30 June 2025 implementing Directive (EU) 2024/1275 of the European Parliament and of the Council by establishing **common templates for the transfer of information from national energy performance of buildings databases to the EU Building Stock Observatory**

https://eur-lex.europa.eu/eli/reg_impl/2025/1328/oj

COMMISSION IMPLEMENTING REGULATION (EU) 2025/1328 Annex I

Information from:

- **Energy performance certificates**
- **Renovation passports**
- **Smart readiness indicators**
- **Inspection reports**

| Indicator | Unit | Total (for all buildings) | Existing buildings | | | | | | | |
|--|------------------------------------|---------------------------|--------------------|----------------------|------------------------|-----------------------|---------------|-----------------------|-----------|-----------------------|
| | | | Total residential | Out of which: | | Total non-residential | Out of which: | | | |
| | | | | Single family houses | Multi-family buildings | | Offices | Educational buildings | Hospitals | Other non-residential |
| Total estimated operational GHG emission reduction after the completion of all steps | [tCO ₂ eq/yr] | | | | | | | | | |
| Average estimated operational GHG emission reduction after the completion of all steps | [kgCO ₂ eq/yr] | | | | | | | | | |
| Average estimated savings on energy bills after completion of all steps | [EUR/building or building unit/yr] | | | | | | | | | |
| Average estimated investment to complete all steps | [thou. EUR/m ²] | | | | | | | | | |

(²⁵) This value should be drawn from the average estimated energy performance from which the energy performance class was estimated for each building.

(²⁶) Percentage improvement compared to the energy consumption before undertaking the renovation.

(²⁷) Percentage improvement compared to the energy consumption before undertaking the renovation.

Member States shall transfer the information regarding the energy performance of buildings from their national databases to the EU BSO by 15 March 2027 and at least once a year thereafter.

LIFE projects support Member States in EPBD implementation



Renovation passport and other EPBD elements; Guidelines for implementation <https://www.bpie.eu/epbdwise/>

Funded by the European Union's LIFE programme, Grant Agreement 101120194, duration 10/2023-06/2026



Smart readiness indicator – improving building energy performance by means of building automation and control systems (BACS) <https://www.easysri.eu/en>

Funded by the European Union's LIFE programme, Grant Agreement 101077169, duration 11/2022-10/2025

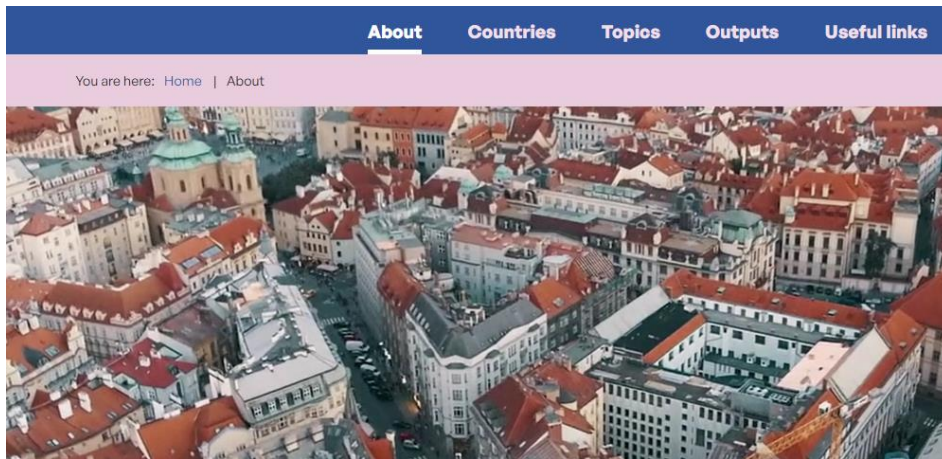
More information:

BUILD UP the European portal for energy efficiency and renewable energy in buildings <https://build-up.ec.europa.eu/en/home>

From Directive to Action: Supporting the Revised EPBD Transposition and Implementation

https://www.rehva.eu/fileadmin/user_upload/MasterPresentation_20240611_PS085_Implementing_the_Energy_Performance_of_Buildings_Directive_recast_Version_Final.pdf

Special support to Member States: Concerted Action EPBD (CA EPBD 6)



The Concerted Action EPBD (CA EPBD) aims to contribute to the reduction of energy use in European buildings through the **exchange of knowledge and best practices in the field of energy efficiency and energy savings** between all 27 EU member states plus Norway.

Partners: Member States

Organisation: CA EPBD 6 is organised around nine Central Teams (topics) – CTs, dealing with specific Articles of the EPBD

Content: Every few months, two-day meetings are organised to facilitate a moderated and informal exchange of experiences.

Reports: The minutes of the meetings remain confidential and are only accessible to partners, but anonymised conclusions and thematic summaries are published on the CAEPBD website.

Special support to Member States: CA EPBD 6

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CT1

[MEPS and trajectories for progressive renovation](#)

Supporting the renovation of existing buildings including minimum energy performance standards for non-residential buildings and trajectories for the progressive renovation of the residential building stock.

CT2

[Renovation passports and energy performance certificates](#)

Exploring the use and links between Renovation Passports and Energy Performance Certificates (EPCs) in relation to the renovation of existing buildings.

CT3

[Deep renovation and renovation passports](#)

Looking at renovations in the context of the National Building Renovation Plans and the use of renovation passports in this pursuit.

CT4

[Finance and information](#)

Focusing on finance for energy efficiency in buildings and the implementation of one-stop-shop services, information campaigns and other incentives.

CT5

[Decarbonisation and zero-emission buildings](#)

Supporting the decarbonisation of heating and cooling, transition to zero-emission buildings and the phasing out of fossil fuels in the building sector.

CT6

[Calculations and lifecycle](#)

Concerned with calculation methods and standards for primary energy and operational CO₂ indicators, energy performance certificates, cost optimality and life cycle carbon footprint.

CT7

[Smart buildings and system integration](#)

Supporting the development of smart buildings, building automation, controls and electronic monitoring for energy efficiency.

CT8

[Building codes and technical requirements](#)

Reinforcing, modernising and enforcing building codes, including sustainable mobility.

CT9

[Information and other complementary activities](#)

Delivering information and tools to support the other central teams and to organise sessions that fall between or outside the scope of the other teams.

Key articles in the EPBD DIRECTIVE (EU) 2024/1275


- › [Article 3 - National building renovation plan](#)
- › [Annex II - Template for the national building renovation plans](#)
- › [Article 8 - Existing buildings](#)
- › [Article 12 - Renovation passport](#)
- › [Annex VIII - Requirements for renovation passports](#)

<https://www.ca-epbd.eu/>

This project has received funding from the European Union's LIFE programme under Grant Agreement no. 101102078.

CA EPBD 6 website as an information portal

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[The European Commission releases full EPBD implementation support package](#)

[Commission and DEA host joint webinar on ways to simplify EPBD implementation](#)

Countries: How MS transpose and implement the EPBD – country related information

Topics: CT related information

Outputs: Thematic reports

Useful links: Resources to support the implementation of the EPBD and coordination with other EU energy-related legislation

Conclusions

- The EPBD sets the necessary course for deep renovations and data availability, and Member States must find the simplest and most effective ways to implement it in practice.
- We need **data to track building renovations and optimise policy instruments**. NBRPs are intended to become the central planning and reporting tool for developing the building stock towards a zero-emission standard, but their effectiveness depends on the data basis.
- In terms of data, EPC **coverage of the building stock** is low in some countries. The renovation passport can fill this gap; however, in many cases, its use will be voluntary, and **RP coverage will depend on the quality of support for building owners**, including financing.
- The **digital building logbook and new methods of data collection** are becoming increasingly important for streamlining and improving building assessment processes.
- **Coordination of the EPBD and EED at national level** is important but not always easy due to the different competent administrative bodies in some Member States.

Thanks for your attention