

EPBD.wise

BRINGING EUROPEAN BUILDING POLICY TO LIFE

Supporting Member States in Effectively Implementing the EPBD

Lessons Learnt from the EPBD.wise Journey

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About EPBD.wise

EPBD.wise is an EU-funded project, providing support to national policymakers to implement the Energy Performance of Buildings Directive (EPBD). Over the course of three years, project partners worked with public authorities in six European countries (Bulgaria, Greece, Hungary, Poland, Romania, and Ukraine) for the design, implementation, and evaluation of key EPBD provisions to ensure our buildings are in line with our climate goals. Starting with the six focus countries, EPBD.wise builds a replicable model to support the widespread implementation of these measures across Europe.

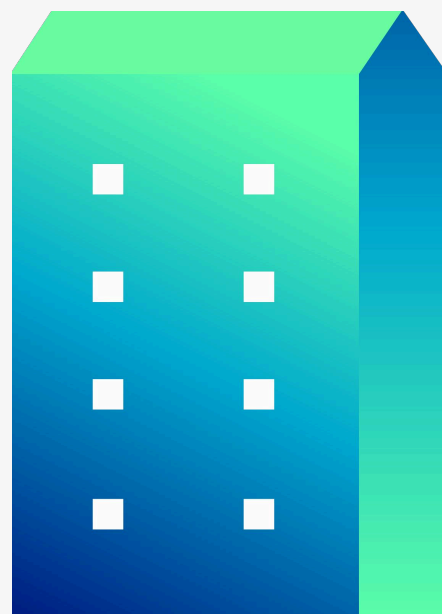
For more information, visit the [EPBD.wise website](#).

CONTENTS



	Executive summary	4
	List of tables and figures	6
1	Introduction	7
2	An integrated approach for EPBD implementation	10
3	Key EPBD policy instruments	14
	3.1 Zero-emission building	14
	3.2 National building renovation plan	16
	3.3 Minimum energy performance standards and national trajectory ...	19
	3.4 Renovation passport	21
	3.5 Energy performance certificate	25
4	Monitoring and evaluation	27
5	Conclusions and outlook	30
	References	32

EXECUTIVE SUMMARY



The recast Energy Performance of Buildings Directive (EPBD) represents a major step in the EU's effort to decarbonise the building stock by 2050. Its implementation requires Member States to move beyond individual policy measures and develop coherent national frameworks that combine regulation, planning, data, financing, technical assistance, social safeguards and monitoring.

The EPBD.wise project was designed to support the EPBD implementation process. Working with public authorities, energy agencies, experts and stakeholders in six focus countries — Bulgaria, Greece, Hungary, Poland, Romania and Ukraine — the project analysed policy needs, identified good practice examples, developed tailored policy guidance and translated the findings into lessons and recommendations relevant for wider EPBD implementation across Europe.

MAIN EPBD.WISE FINDINGS

- **EPBD implementation should be treated as an integrated policy process, not as a set of separate requirements.**

For an effective EPBD implementation, Member States need to align long-term targets, regulatory instruments, financing mechanisms, data systems, social safeguards, advisory services and monitoring frameworks. If these elements are developed separately, EPBD implementation risks becoming fragmented, administratively burdensome and less effective.

- **Policy recommendations should be grounded in clearly identified policy needs.**

Effective guidance must begin with a structured assessment of national barriers, data gaps, institutional capacities and implementation needs. This EPBD.wise approach helped ensure that recommendations were not only technically sound, but also relevant to the national policy realities of each country.

→ **There is no single blueprint for EPBD implementation.**

Each Member State starts from very different positions, depending on its building stock, heating systems, fossil fuel dependence, electricity generation mix, data availability and administrative capacity. EU objectives therefore need to be implemented through nationally adapted pathways. Through its EU-wide replication work, EPBD.wise translated country-specific findings into practical implementation pathways and decision-support tools that can help Member States adapt EPBD requirements to their own building stock, energy system, data availability, institutional capacity and policy priorities.

→ **Regulatory ambition must be complemented with enabling support.**

The implementation of EPBD regulatory measures is necessary to drive renovation and decarbonisation of buildings, but they cannot succeed without financing, technical assistance, workforce capacity, quality assurance, communication and support for vulnerable households.

→ **Stakeholder engagement improves the quality and relevance of policy guidance.**

Engagement with public authorities, experts and practitioners should not be used only as a final validation step. It should be embedded throughout the entire policy development process to test assumptions, identify practical barriers and strengthen ownership of the recommendations. For example, discussing different scenarios in a transparent way with stakeholders and the general public when developing the national building renovation plan could help to increase buy-in and strengthen the results.

→ **Replication requires contextual adaptation, not direct transfer.**

The lessons derived from the focus countries' analysis can provide useful insights for other Member States, but these cannot be applied directly without adjustment. Instead, they need to be translated into general principles or approaches that can be tailored to different national circumstances, considering variations in policy frameworks, market conditions and administrative capacities. Replication is therefore most effective when it combines shared EU-level guidance with sufficient flexibility for countries to interpret and adapt measures to their specific context.

→ **Monitoring and evaluation are central to effective implementation.**

Reliable building data, interoperable databases and monitoring systems are essential for targeting measures, tracking progress and evaluating impact. Monitoring, reporting and evaluation should therefore be part of the implementation architecture from the beginning, rather than treated as end-of-cycle reporting obligations.

→ **EPBD implementation must remain aligned with the wider EU policy framework.**

The project highlights the importance of coordinating EPBD implementation with other EU files, including the Energy Efficiency Directive, the Renewable Energy Directive, the Emissions Trading System for buildings, road transport and additional services, the Social Climate Fund and EU Taxonomy. This alignment is necessary to avoid inconsistencies, reduce administrative burden and ensure that climate, energy security, affordability and social objectives are pursued together.

LIST OF

TABLES AND FIGURES

Table 1: Selected optional features to be included in renovation passport schemes according to Annex VIII of the EPBD	22
Figure 1: Overview of the Fit for 55 package and how specific elements are linked to the EPBD	12
Figure 2: The technical building blocks of a national ZEB definition	15
Figure 3: Recommended policy emphasis by fossil-fuel share and primary energy factor for electricity	18
Figure 4: Policy scenarios for Article 9 compliance	20
Figure 5: Components of a renovation passport	24
Figure 6: The role of EPCs in EPBD implementation	25
Figure 7: Policy needs related to EPC implementation	26
Figure 8: An integrated policy cycle	27

1

INTRODUCTION

The Energy Performance of Buildings Directive (EPBD) represents the most important legislative instrument for buildings decarbonisation across the European Union. The aim of the revised EPBD version (2024/1275) was to upgrade the existing regulatory framework to reflect higher climate ambitions coupled with further social attention while providing Member States with the necessary flexibility to consider the differences in the building stock across Europe. It introduces or reinforces several key instruments, including the zero-emission building standard, national building renovation plans, minimum energy performance standards, national trajectories, renovation passports, energy performance certificates and building performance databases. The revised EPBD entered into force on 28 May 2024, with the deadline to be transposed into national laws by **29 May 2026**.

Against this background, the EPBD.wise project aimed to support Member States in the policy design, implementation, monitoring and evaluation of EPBD provisions to avoid lock-in effects, to provide consistency with the EU's long-term energy and climate targets, and to ensure the measures are affordable and socially acceptable. EPBD.wise worked with public authorities, energy agencies, experts and stakeholders in **six focus countries: Bulgaria, Greece, Hungary, Poland, Romania and Ukraine**. These countries provided the practical testing ground for analysing policy needs,¹ identifying good practice examples, and developing tailored policy guidelines. At the same time, the project provided results on a wider geographical scope to ensure that the lessons emerging from the focus countries could be replicated and inform EPBD implementation across the EU.

1. Diaconu, D. (2026). What Is Needed for Effective EPBD Implementation? Summary of Policy Needs. Zenodo. <https://doi.org/10.5281/zenodo.20271404>.

The intervention logic of EPBD.wise followed four main phases:

1 Understanding and mapping policy needs related to EPBD implementation

2 Drafting tailor-made policy packages for the focus countries

3 Replicating the policy guidelines to all EU Member States

4 Communicating and disseminating the project's findings.

The project focused on five core EPBD policy instruments:

Zero-emission building (ZEB) standard

National building renovation plan (NBRP)

Minimum energy performance standards (MEPS) and national trajectory

Renovation passport

Energy performance certificate (EPC)

These provisions were selected because they are central to EPBD implementation logic and strongly interconnected.

This final publishable report summarises the key results and main lessons of the EPBD.wise project. It is intended for national policymakers and public authorities working on EPBD implementation, stakeholders involved in building renovation and decarbonisation, and other LIFE Clean Energy Transition sub-programme beneficiaries supporting the implementation of EU building policies. The report follows the project journey and synthesises the most relevant lessons learnt, policy messages and recommendations emerging from the research carried out; it highlights what the project revealed about effective EPBD implementation, what can be replicated in other national contexts, and how future projects can better support Member States in translating EU legislation into coherent, practical and socially acceptable policy frameworks.

The report is structured around the policy instruments themselves. Section 2 explains how the instruments interact and how they fit within the wider EU energy and climate policy framework. Section 3 presents the main insights and recommendations on each policy instrument. Section 4 summarises the project's work on the monitoring, reporting and evaluation of EPBD provisions. Section 5 concludes with forward-looking messages for policymakers implementing EPBD.

2

AN INTEGRATED APPROACH FOR EPBD IMPLEMENTATION

The EPBD should be understood as an integrated policy architecture rather than a collection of separate policy instruments. Its provisions have different functions, but they are designed to work together towards the same objective: transforming the EU's buildings into a zero-emission building stock by 2050.

Within this architecture, **the zero-emission building standard provides the long-term anchor.** It defines the performance level towards which new buildings and, progressively, the existing building stock should move. The ZEB standard is not only relevant for new constructions, but also gives direction to renovation policies, EPC rescaling, renovation passport pathways, public building renovation and long-term investment planning. In the EPBD framework, EPC class A corresponds to the ZEB standard, while renovation passports can show how a specific building can progressively move towards ZEB status. MEPS and national trajectories should also be designed in line with the objective of a zero-emission building stock by 2050. **This makes ZEB the reference point against which targets, milestones and policy measures should be tested.**

National building renovation plans are the overarching planning and governance framework for this transition. They should bring together the overview of the national building stock, targets and milestones, policies and investment needs, financing resources and administrative capacity. Their role is not only to report what Member States are doing, but to coordinate in a coherent and consistent way the implementation of different policy instruments.

NBRPs should specify how ZEB thresholds are set, how Article 9 targets and milestones will be achieved, how EPC databases will inform building stock analysis, how renovation passports will support staged deep renovation, and how financing and support schemes will be targeted. In this sense, **the NBRP is the umbrella instrument under which all the other EPBD provisions should be aligned.**

Article 9 provides the main regulatory driver for improving the existing building stock and progressively phasing out the worst-performing buildings. For non-residential buildings, it requires Member States to set minimum energy performance standards to address the worst-performing buildings. For residential buildings, each Member State will adopt its own national trajectory to reduce their average specific primary energy use by 16% by 2030 and 20–22% by 2035, with a significant share of improvements (55%) coming from the worst-performing buildings. **These requirements create a stronger focus on the worst-performing building stock where the greatest energy savings and social benefits can be achieved.**

Energy performance certificates are the information and data backbone of the EPBD framework. They provide building-level information on energy performance and can support building stock analysis, MEPS implementation and compliance, renovation advice, evidence for financing, and monitoring and evaluation. Their value depends on reliability, quality control, digitalisation and interoperability. A weak EPC system can limit the effectiveness of several other policy instruments; a strong EPC can become a central component of the national building data ecosystem.

Renovation passports complement EPCs by reflecting actual user behaviour and providing a staged renovation pathway for individual buildings. While an EPC describes the current performance of a building based on standard use and provides recommendations, a renovation passport can set out a staged roadmap towards deep renovation or ZEB performance. This is particularly important where full renovations cannot be carried out in one step, or where owners need to plan investment over time. Renovation passports can also help avoid lock-in effects by showing the optimal sequencing of measures, including building envelope improvements, heating system replacement, renewable energy integration, connection to efficient district heating and cooling, building automation and control systems, and climate change adaptation measures. Their value is strongest when they are linked to EPCs, digital building logbooks, one-stop shops, financing schemes and building databases.

The interaction between EPCs and renovation passports is especially important. The two instruments share data and can be issued together, reducing costs and improving consistency for building owners. Where Member States allow EPCs and renovation passports to be drawn up jointly, the renovation passport can replace EPC recommendations with a more detailed staged roadmap. This can make renovation advice more practical and improve the connection between information, financing and implementation.

EPBD implementation also needs to be embedded in the wider EU energy and climate framework. The [Energy Efficiency Directive \(EED\)](#) reinforces the “energy efficiency first” principle and complements the EPBD through obligations for public buildings, local energy planning, support for one-stop shops, and stronger provisions to protect vulnerable households and address energy poverty. The [Renewable Energy Directive \(RED\)](#) supports the decarbonisation of heating and cooling and the integration of renewable energy in buildings. The extension of the European [Emissions Trading System to buildings \(ETS2\)](#) and the [Social Climate Fund \(SCF\)](#) create new links between carbon pricing and targeted support for vulnerable households. The [EU Taxonomy](#) and wider sustainable finance framework influence investment flows and renovation finance.

This means that EPBD implementation must be coordinated not only internally across EPBD instruments, but also with wider EU and national energy, social, housing and financing policies.

Figure 1. Overview of the Fit for 55 package and how specific elements are linked to the EPBD (marked green) (Source: [European Commission, 2021](#))



The Energy Efficiency Directive strengthens the “energy efficiency first” principle and complements the EPBD through measures such as the obligation to renovate 3% of the total floor area of public buildings each year and the requirement for larger municipalities to prepare local heating and cooling plans. **These provisions should be aligned with EPBD instruments, ensuring that public buildings serve as early examples of deep renovation while renovation strategies are coordinated with the decarbonisation of heating and cooling systems, including efficient district heating and cooling.** Such alignment can strengthen planning, investment and implementation across governance levels, helping Member States connect building renovation priorities with broader energy infrastructure and efficiency objectives.

The Renewable Energy Directive adds another layer of coherence. It sets a specific benchmark of 49% renewable energy in buildings and strengthens the role of renewable heating and cooling, district heating and cooling, renewable acceleration areas, renewable energy communities and self-consumption. **EPBD instruments should be designed so that renovation, demand reduction and renewable energy deployment are sequenced coherently.** If renewable energy provisions are weakened or misaligned with renovation planning, Member States may deploy renewables in insufficiently renovated buildings, leading to higher demand, increased system costs and reduced effectiveness of ZEB standards, renovation passports and national trajectories.

The introduction of the Social Climate Fund and the extension of the Emissions Trading System to buildings make the social dimension of EPBD implementation even more important. Carbon pricing in buildings can increase heating costs before households benefit from renovation, especially where fossil fuel use remains high.

The Social Climate Fund can support vulnerable households through direct income support and structural investments, including building renovation, clean heating and cooling and renewable energy integration. This creates a strong need to align NBRPs with social climate plans. The two planning processes should **use consistent definitions of energy poverty and vulnerable households, identify overlaps between worst-performing buildings and vulnerable groups, and ensure that financial and technical support reaches those most exposed to energy costs and least able to renovate.** Delaying the implementation of ETS2 or weakening the Social Climate Fund would increase the burden on Article 9 instruments, as MEPS and national trajectories would have to deliver similar decarbonisation outcomes with fewer price signals and less targeted support, increasing the risk of higher energy costs and lower social acceptance for renovation measures.

Finally, the EU Taxonomy and sustainable finance framework are also relevant for EPBD target achievement. As the market increasingly differentiates between efficient and inefficient buildings, reliable EPCs, ZEB definitions, renovation passports and building data systems can help channel private finance towards renovation. However, there is a need to **align financial criteria with the revised EPBD framework**, particularly as ZEB replaces nZEB (nearly zero-energy building) as the reference point for new buildings and deep renovation after 2030. **Better alignment between regulatory obligations and financing instruments would reduce uncertainty, support investment planning and help avoid stranded assets.** If sustainable finance criteria remain disconnected from the revised EPBD framework, private investment may continue to flow towards renovation levels that are insufficient for ZEB pathways, meaning that banks and investors may fund only partial upgrades instead of full deep renovations. This would require governments to step in later with additional subsidies or stricter regulations to achieve ZEB standards, increasing public costs and creating a higher risk that buildings renovated today will need further costly upgrades in the future.

The main lesson from EPBD.wise is that Member States should treat EPBD implementation as a coherent policy framework that aligns long-term goals, regulatory instruments, data systems, financing mechanisms, social safeguards, advisory services, and monitoring and evaluation mechanisms. Within this framework, ZEB should provide the long-term direction for the transformation of the building stock, NBRPs should plan and coordinate the pathway, Article 9 should drive the renovation of existing buildings, EPCs should supply reliable data and market signals, and renovation passports should guide staged building-level action. These instruments should be reinforced through alignment with wider EU policies and funding mechanisms, including the Energy Efficiency Directive, Renewable Energy Directive, extended Emissions Trading System, Social Climate Fund and EU Taxonomy.

The success of EPBD implementation will depend on how Member States combine its instruments into practical, effective and socially fair policy packages. When instruments are implemented separately, there is a risk of duplication, inconsistency, administrative burden and lock-in effects. Where they are designed consistently, they create a robust implementation framework capable of accelerating renovation, reducing fossil fuel dependency, improving affordability and putting the building stock on a credible pathway towards zero emissions.²

2. More information on the synergies between EPBD and *Fit for 55* files can be found here: Diaconu, D. (2026). What Is Beyond Fit for 55 for Building Policies? Harmonisation of the EU building policy framework. Zenodo. <https://doi.org/10.5281/zenodo.20271423>.

3

KEY EPBD POLICY INSTRUMENTS

3.1 Zero-emission building

Key characteristics

The recast EPBD introduced the ZEB standard as a reference for a decarbonised building stock by 2050: all new buildings must be zero-emission by 2030, those owned by public bodies by 2028, and the existing stock by 2050. The EPBD mentions that a ZEB has a very high energy performance and produces no on-site carbon emissions from fossil fuels, keeping operational greenhouse gas emissions to zero or very low. It is defined through three indicators: total annual primary energy use, operational CO₂ emissions, and life-cycle global warming potential. **The ZEB is the endpoint that the other EPBD instruments work toward.**³

The ZEB is the successor of the nearly zero-energy building (nZEB), which aimed at creating a balance between energy use and on-site renewable production over the year. The ZEB keeps that energy-performance logic and increases ambition: it broadens the focus from the annual energy balance to greenhouse gas emissions and life-cycle impact, and its energy demand threshold should sit at least 10% below the nZEB level. This requires Member States to revise the national calculation basis on which nZEB levels were set. The nZEB rollout offers two lessons that were considered: **thresholds set without regard to national feasibility tend to be ignored or avoided, and the lack of capacity of designers, builders and contractors is a recurring bottleneck.**

3. Section 2 of this report describes the synergies between different EPBD provisions and policy instruments.

Key insights from focus countries

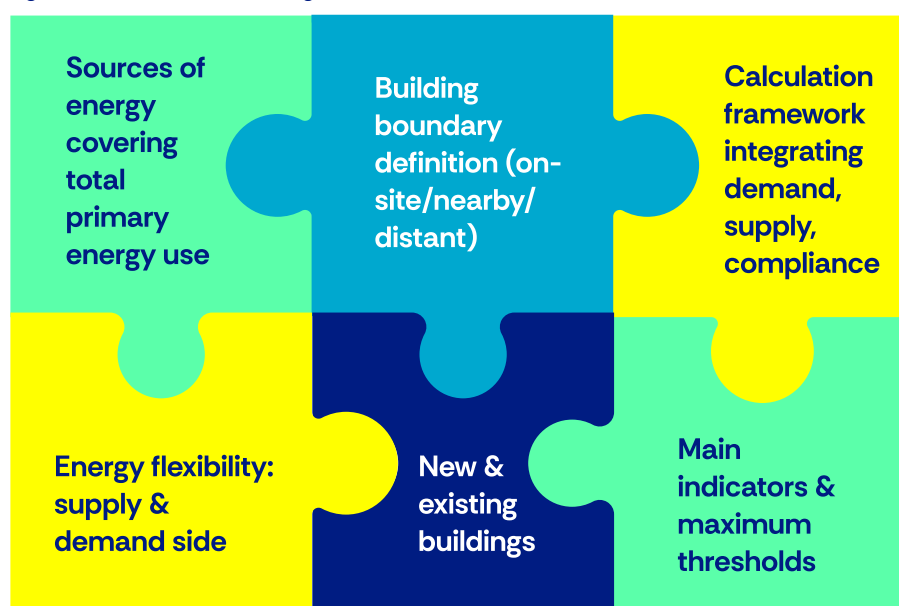
The EPBD-wise ZEB guidance⁴ reflected priorities from three focus countries (Bulgaria, Hungary and Ukraine) and highlighted the importance of adapting national definitions to different starting points. Some countries face challenges related to fossil-based heating systems and electricity carbon intensity; others need to clarify the role of district heating, renewable energy communities or on-site renewable generation. Across different contexts, the same issue emerged: **ZEB definitions must be robust enough to support long-term decarbonisation, but practical enough to be implemented through national building codes, EPCs and renovation policies.**

Key insights and recommendations for all Member States

Turning the ZEB definition into an operational standard requires each Member State to make several choices. A ZEB's total primary energy use must be covered by renewables generated on-site or nearby, by a renewable energy community, by an efficient district heating and cooling system, or by carbon-free sources. The system boundary has to be set either as the building assessment boundary or the building site boundary; on-site renewable generation has to be treated consistently in the calculation; and the two thresholds, primary energy and operational CO₂, are fixed against national cost-optimal levels. In the national certification framework, the ZEB performance level corresponds to EPC class A, which ties the standard to the way building performance is classified and communicated. A practical finding is that ZEB status may not depend on the building alone. In dense urban contexts, where on-site renewable generation is often limited, compliance can rely on the networks the building connects to, such as efficient district heating or a carbon-free electricity grid. **Building design then becomes inseparable from energy infrastructure planning.**

New buildings should be designed to meet their energy needs from on-site or nearby renewables, while the existing stock reaches zero emissions by 2050 through phased deep renovation; where full ZEB transformation is not technically or economically feasible, a minimum 60% reduction in primary energy use applies. Energy flexibility on the demand and supply side also has to be accounted for.

Figure 2. The technical building blocks of a national ZEB definition (Source: EPBD-wise)



4. Azzolini, G., De Rossi, P., Di Turi, S. and Zanghirella, F. (2026). Guidelines for the development of a ZEB definition. Zenodo. <https://doi.org/10.5281/zenodo.20268438>.

Four areas of action stand out, and the sequence matters.



3.2 National building renovation plan

Key characteristics

National building renovation plans (NBRPs) are the strategic backbone of EPBD implementation and the umbrella under which the other policy instruments are coordinated. Introduced under Article 3 of the recast EPBD (2024/1274), they replace and strengthen the long-term renovation strategies introduced under [EPBD \(2018/844\)](#).

Each plan must set out a credible pathway towards a highly energy-efficient and decarbonised building stock by 2050. The NBRP should bring together an overview of the national building stock and a roadmap with national targets and measurable progress indicators, including the reduction of energy poverty. It also sets out the implemented and planned policies and measures, the investment needs and financing sources, the thresholds for zero-emission buildings, the minimum energy performance standards for non-residential buildings, and the national trajectory for residential buildings with its 2030 and 2035 milestones.

EPBD.wise showed that **NBRPs should not be treated as static reporting documents**. Their value lies in helping Member States coordinate policy choices over time. They should explain how targets will be achieved, which instruments will be used, how progress will be tracked, and how measures will be adjusted if implementation is not on track.

POLICY NEEDS

Key policy needs identified through EPBD.wise include reliable building stock data; methods for assessing renovation potential; modelling of renovation pathways; investment planning; stakeholder engagement; links with Article 9, EPCs, renovation passports and ZEB definitions; and monitoring systems that support continuous improvement. This identification of policy needs shaped the work and results of the EPBD.wise project.

Key insights from focus countries

The project developed country-specific NBRP guidance for Poland, Romania and Ukraine, using the Invert techno-economic building stock model. The research work confirmed that national contexts differ significantly in terms of data availability, heating system mix, building stock characteristics, institutional capacity, and policy readiness. Still, the same core needs recurred everywhere: better building stock data, more robust scenario modelling, clearer financing strategies, and stronger links with the other EPBD instruments.

The focus-country work also demonstrated the value of scenario analysis. For each country, **five policy scenarios were modelled, ranging from strong regulatory approaches to purely market-based strategies**, allowing policymakers to see the effects of different policy choices and to test whether proposed measures are sufficient to meet the 2030, 2035 and 2050 milestones.

The results for Poland and Romania illustrate how the same scenario framework translates into different energy carrier pathways depending on national starting points. In Poland, where coal still plays a significant role in heating, the regulatory scenarios with MEPS in residential and non-residential buildings virtually eliminate coal and oil by 2035–2040 and drive a substantial expansion of district heating, biomass and heat pumps, raising the renewable share in the residential sector from around 28% in 2020 to 95% by 2050; under purely economic instruments, by contrast, gas retains a substantial presence through 2050.⁵ In Romania, the strong regulatory scenario roughly halves final energy demand by 2050, phasing out coal by 2030 and oil by 2035, with biomass remaining the dominant carrier alongside growing electricity and district heating; without residential MEPS, demand falls by only 17–22% and gas remains the largest single energy carrier in 2050.⁶ **In both countries, purely economic instruments, even with a carbon price of €300/t, proved insufficient to phase out fossil fuels at the required pace.**

Presenting several alternative pathways, rather than a single preferred one, makes the trade-offs between regulatory and economic instruments visible and provides a concrete basis for public consultation.

5. Özer, F.E., Imamovic, I., Kranzl, L., Söder, P., Müller, A., Conselvan, F. and Ortner, S. (2026). Development of NBRP: Policy Guidelines for Poland. EPBD.wise Deliverable D2.2, TU Wien. <https://doi.org/10.5281/zenodo.20268509>.

6. Özer, F.E., Imamovic, I., Kranzl, L., Söder, P., Müller, A., Conselvan, F. and Ortner, S. (2026). Development of NBRP: Policy Guidelines for Romania. EPBD.wise Deliverable D2.2, TU Wien. <https://doi.org/10.5281/zenodo.20268594>.

Key insights and recommendations for all Member States

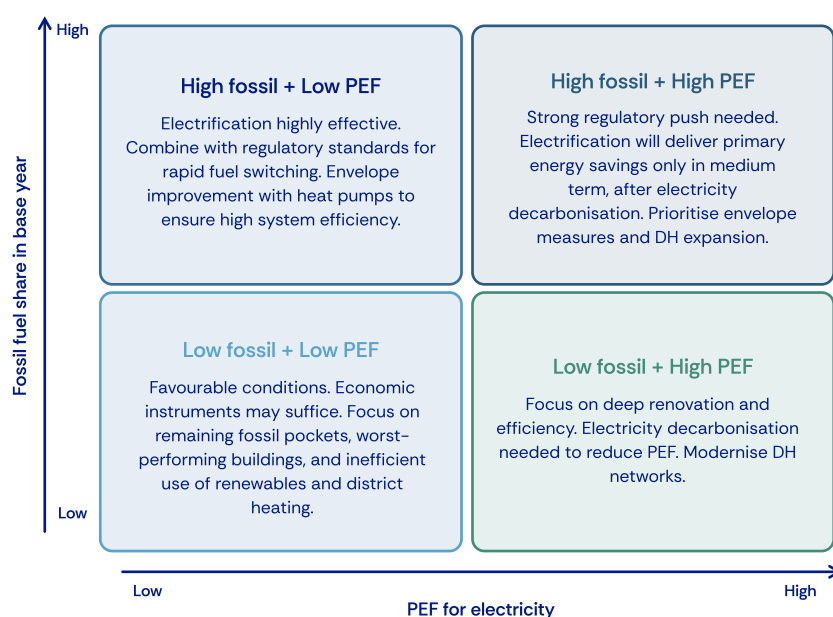
Extending the analysis to all EU-27 Member States⁷ confirmed that NBRPs are the central planning tool for building decarbonisation, but that there is no single blueprint for their design. A clustering analysis grouped Member States by six characteristics — expected building stock growth, fossil-fuel share, heating degree days, primary energy factor (PEF) for electricity, renovation rate, and previous long-term renovation strategy quality — and showed that the PEF for electricity and the fossil fuel share are the two factors that most distinguish national starting points.

The scenario results carry a consistent message: **a combination of regulatory standards and economic incentives is more effective than either approach alone**. Under the most ambitious scenario, Member States achieve primary energy demand reductions of 15–22% by 2030, 26–36% by 2035 and 53–65% by 2050, with gases and liquid fuels falling below 12% of the final energy mix. Crucially, the fossil-boiler ban and residential MEPS prove decisive: without them, gas and liquid fuel shares remain at 29–49% by 2050, even with a high carbon price, leading to high costs for substituting these with highly expensive renewable alternatives. **Regulatory measures are therefore necessary in order to achieve climate neutrality in a cost-effective way; market instruments alone are insufficient, although economic incentives can achieve similar results in countries that already start from a low fossil-fuel share.**

The appropriate policy mix depends on each country's starting point. Two dimensions are crucial: the fossil-fuel share in the base year and the PEF for electricity, which determines how much primary energy credit a country earns from electrifying heating. Where electricity is already largely decarbonised, heat pump deployment delivers large primary energy savings quickly; where the electricity generation is still carbon-intensive, deeper envelope renovation and the decarbonisation of district heating must come first.

Because a declining PEF can make Article 9 targets appear to be met through grid decarbonisation rather than genuine building improvements, NBRPs should model scenarios under both constant and declining PEF to make the contributions of the PEF transparent. Figure 3 maps the recommended policy emphasis along these two dimensions.

Figure 3. Recommended policy emphasis by fossil-fuel share and primary energy factor for electricity (Source: EPBD.wise)



7. Özer, F. E., Kranzl, L., Müller, A., Conselvan, F. and Ortner, S. (2026). Development of National Building Renovation Plans: Policy Guideline Summary. Zenodo. <https://doi.org/10.5281/zenodo.20713422>.

3.3 Minimum energy performance standards and national trajectory

Key characteristics

Article 9 of the EPBD establishes binding obligations for renovation: minimum energy performance standards for non-residential buildings (16% worst-performing buildings to be renovated by 2030, 26% by 2033) and national trajectories for residential buildings (16% specific primary energy reduction by 2030, 20–22% by 2035). EPBD.wise analysed Poland and Romania as focus countries, modelling five policy scenarios to identify effective implementation pathways. Analysis reveals that across diverse national contexts — differentiated primarily by electricity primary energy factors and fossil-fuel heating shares — **regulatory frameworks outperform market-based instruments alone in achieving Article 9 targets.**



This assessment of policy needs informed the overall direction and outputs of the EPBD.wise project.

Key insights from focus countries

For Poland,⁸ modelling carried out with the same model as applied for the NBRP-related analyses (see chapter 3.2) confirmed the importance of combining regulatory and market approaches. Regulatory approaches that combine MEPS with a carbon price of €75/t CO₂ and fossil boiler bans deliver 80–85% energy reduction in high-consumption sectors like healthcare by 2033, versus only modest improvements under purely economic instruments.

8. Conselman, F., Müller, A., Hummel, M., Özer, F. E., Imamovic, I., Söder, P., Kranzl, L. and Ortner, S. (2026). Development of Article 9: Policy guidelines for Poland. Zenodo. <https://doi.org/10.5281/zenodo.20268708>.

As critical elements we identified the following: to align MEPS with available data, design trajectories linked to coal phase-out by 2040, develop grants of up to 50% for worst-performing buildings and strengthen inter-ministerial coordination.

In the case of Romania,⁹ the modelling of policy instruments confirms MEPS-based regulatory pathways alone can meet 2030/2035 milestones, while market-only approaches fail. As priorities, we identified the following actions: establish sector-specific thresholds, prioritise multi-family urban buildings initially, align with electricity decarbonisation pathways, develop integrated financing (NRRP + Social Climate Fund), establish regional one-stop shops.

Figure 4. Policy scenarios for Article 9 compliance (Source: EPBD.wise)



Key insights and recommendations for all Member States

The EU-wide Article 9 replication work¹⁰ confirmed that **regulatory standards are necessary to shift the building stock at the required pace**. Economic incentives and carbon pricing can support implementation, but they are unlikely to be sufficient without clear regulatory requirements.

However, regulation alone is not enough. MEPS and trajectories need strong enabling frameworks: financing, technical assistance, compliance tools, social safeguards, communication and workforce capacity. They should also be linked to EPCs for data and compliance, renovation passports for staged building-level pathways, and NBRPs for strategic coordination.

9. Conselman, F., Müller, A., Hummel, M., Özer, F. E., Imamovic, I., Söder, P., Kranzl, L. and Ortner, S. (2026). Development of Article 9: Policy guidelines for Romania. Zenodo. <https://doi.org/10.5281/zenodo.20268763>.
10. Conselman, F., Müller, A., Harringer, D., Özer, F. E. and Kranzl, L. (2026). Minimum Energy Performance Standards and Trajectories of Progressive Building Renovation: Policy Guideline Summary. Zenodo. <https://doi.org/10.5281/zenodo.20713531>.

Four priority actions emerge across all Member States:

- **Invest in robust building stock data.**

Without comprehensive, quality-assured data, Member States cannot identify worst-performing buildings or set credible MEPS thresholds. Hybrid approaches combining EPC data, archetype-based modelling and national energy statistics work where coverage is incomplete. Integrated platforms like France's IMOPE database (21 million addresses from 100+ sources) demonstrate the potential of centralised data systems.

- **Combine mandatory standards with financial support.**

Regulatory frameworks alone are insufficient without predictable, sustained financing. Good practices include trigger-point obligations (e.g., renovation at property sale, as in Flanders), phased bans on worst-performing classes (e.g., France: G banned 2025, F by 2028, D requirement by 2034) and sector-specific standards (e.g., Netherlands offices: EPC C by 2023). Financial support must include direct subsidies (up to 50% for vulnerable households), green loans, tax incentives, and energy service company (ESCO) or on-bill models. Integrated advisory services, such as Scotland's Home Energy Scotland model, reduce transaction costs for building owners.

- **Protect vulnerable households through targeted governance.**

Worst-performing buildings disproportionately house lower-income residents. Dedicated support must include full-cost coverage for lowest-income brackets, tailored collective decision-making frameworks for multi-family buildings and ESCO or on-bill financing to remove upfront barriers. Data-driven prioritisation tools can integrate technical condition, environmental performance, social vulnerability and operational feasibility to sequence investments coherently. Renovation passports translate Article 9 targets into individualised building-level roadmaps, lowering entry barriers for building owners.

- **Embed Article 9 within national building renovation plans.**

Article 9 trajectories must be embedded in NBRPs with transparent, consistent methodologies from the outset. Milestone-setting should be scenario-informed and disaggregated by building type and renovation depth. EPC recalibration by 2026 (class G as worst-performing, class A as zero-emission building) will strengthen coherence across instruments. Digital building logbooks and renovation passports must be systematically linked to national monitoring frameworks to enable continuous policy refinement and compliance tracking.

3.4 Renovation passport

Key characteristics

Renovation passports are designed to guide building owners through staged renovation towards deep renovation resulting in a zero-emission building. They respond to a practical challenge: many buildings cannot be renovated in one step due to cost, complexity, ownership structures or disruption. A renovation passport can provide a clear roadmap, showing what should be done first, what can follow later, and how each step contributes to long-term performance goals. Furthermore, renovation passports have the potential to link the aggregate level of the NBRP with the individual building level: because they must be uploaded to the national database on energy performance of buildings according to Article 22, they can also play a role in monitoring the NBRP.

The EPBD requires Member States to establish national renovation passport schemes, but the use of the instrument remains voluntary unless Member States decide otherwise.

This means that renovation passports must be designed as useful, accessible and affordable tools if they are to be widely taken up. In this regard, the renovation passport holds great potential, especially when specific optional elements of Annex VIII are considered in addition to the mandatory elements (see Table 1 below). However, its implementation remains challenging: **renovation passports must be affordable for users, which requires a highly efficient and scalable production process.** This can be achieved by making full use of the potential for data access and reuse associated with the digital building logbook concept.

Table 1. Selected optional features to be included in renovation passport schemes according to Annex VIII of the EPBD
(Source: EPBD.wise)

Examples of optional features of Annex VIII which are relevant for property and facility managers	
(a) an indicative timing of the steps	Please note the following explanation regarding 'each step': More detailed information is only ever provided for the next immediate renovation step. This means that, once a renovation step has been implemented, the roadmap is updated and the next step is described in greater detail. This method helps to manage the uncertainty associated with the long-time horizon until 2050. In addition, by uploading the updated renovation passport including the updated roadmap to the database for the energy performance of buildings (according to EPBD Article 22), the implementation of the renovation measures can be tracked. Over time, this will provide useful information for policymaking.
(b) for each step:	
(ii) how the energy performance of the building would compare to minimum energy performance requirements for buildings undergoing major renovation, nearly zero-energy building and zero-emission building requirements after completion of the step and how the energy performance of the building elements replaced would compare to minimum energy performance requirements for single building elements, where these exist	
(iii) the estimated costs for carrying out the step	
(iv) the estimated payback period for the step, with and without any available financial support	
(v) the estimated time needed to carry out the step	
(vii) the estimated lifetime of measures and the estimated maintenance costs	
(iii) the technical conditions needed for an optimal roll-out of low temperature heating	
(iv) how the renovation steps and additional measures could improve the smart readiness of a building	
(vi) the underlying assumptions behind the calculations provided or links to the relevant web page where they can be found	

POLICY NEEDS

Key policy needs include decisions on mandatory and optional content; links with EPCs and digital building logbooks; data access and update rules; software tools; quality assurance; one-stop shops; financing; public building strategies; and monitoring indicators. The identified policy needs provided the basis for the project's subsequent analysis and recommendations.

Key insights from focus countries

The project developed renovation passport guidance for Greece,¹¹ Hungary,¹² Romania¹³ and Ukraine.¹⁴ These countries had different starting points, ranging from existing energy advice or EPC systems to less developed renovation roadmap tools. This confirmed that Member States need flexible implementation pathways.

The country work showed that **renovation passports should not be over-designed at the start**. A simple and scalable core can support early implementation, while optional elements can be added where capacity, data and user needs justify them. **The tool must also be adapted to different building types, including single-family homes, multi-apartment buildings, non-residential buildings and public buildings.**

Key insights and recommendations for all Member States

The policy guideline summary translated the country-specific work into a **modular implementation approach**¹⁵ recommends a **stable mandatory core, complemented by selected optional and additional elements where useful and feasible**. This allows Member States to establish renovation passport schemes that are affordable, scalable and adapted to different building types and user needs, while leaving room for more advanced features where institutional capacity, data systems and market readiness allow. The distinction between mandatory and optional elements creates different possible levels of ambition for renovation passports, ranging from a basic version focused on minimum requirements to a more comprehensive version that can function as a pre-planning tool.

The renovation passport policy guideline summary responds to this challenge by proposing a structured way to combine mandatory and optional elements, ensuring that renovation passports remain practical and affordable while still providing meaningful long-term guidance for staged renovation. The components of a renovation passport offering added value are shown in the figure below:

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11. Geissler, S. and Sticher, B. (2026). Development of Renovation Passports: Policy Guidelines for Greece. Zenodo. <https://doi.org/10.5281/zenodo.20269417>.
 12. Geissler, S. and Sticher, B. (2026). Development of Renovation Passports: Policy Guidelines for Hungary. Zenodo. <https://doi.org/10.5281/zenodo.20269483>.
 13. Geissler, S. and Sticher, B. (2026). Development of Renovation Passports: Policy Guidelines for Romania. Zenodo. <https://doi.org/10.5281/zenodo.20269534>.
 14. Geissler, S. and Sticher, B. (2026). Development of Renovation Passports: Policy Guidelines for Ukraine. Zenodo. <https://doi.org/10.5281/zenodo.20269506>.
 15. Geissler, S. and Sticher, B. (2026). Development of Renovation Passports: Policy Guideline Summary. Zenodo. <https://doi.org/10.5281/zenodo.20713590>.

BASIC ADMINISTRATIVE DATA for correct allocation (unit/building, EPC, type) in the Art. 22 database; for cross-database linking; for BSO/NBRP reporting; and to activate type-specific software modules.

RENOVATION ROADMAP CHART

FOR ZEB 2050 should cover climate adaptation, with building-specific sequencing and indicative timing for property management.

**DETAILED NEXT STEP
(TECHNOLOGIES, PRODUCTS,
COST) IS POSSIBLE**

while long-term renovation details are uncertain. Update the roadmap after each step.

REQUIREMENTS VARY BY

BUILDING TYPE: non-residential public buildings must meet EPBD MEPS plus EED Article 6; residential buildings are exempt from MEPS.

**INDICATORS ALSO COVER THE
ENERGY EFFICIENCY FIRST**

PRINCIPLE; update all indicators after each renovation step, including the roadmap.

**LOCATION-SPECIFIC
OPPORTUNITIES AND**

CHALLENGES: decarbonisation options depend on local grid capacity/smart capabilities and expansion plans. Climate risks also shape adaptation measures.

PAYBACK/COST-

EFFECTIVENESS BASIS: compare bill consumption vs. averages (adjust for user behaviour). Use suitable energy-type breakdowns; supplement/replace with metered data where available.

**PREDEFINED MEASURES FROM
A CATALOGUE**

addressing interactions, lock-in avoidance, sequencing; including green-blue landscaping. They differ by building type and region.

LINK WITH ONE-STOP-SHOP for information that remains the same for every renovation passports and can be accessed via a link to a website maintained.

Figure 5. Components of a renovation passport (Source: EPBD.wise)

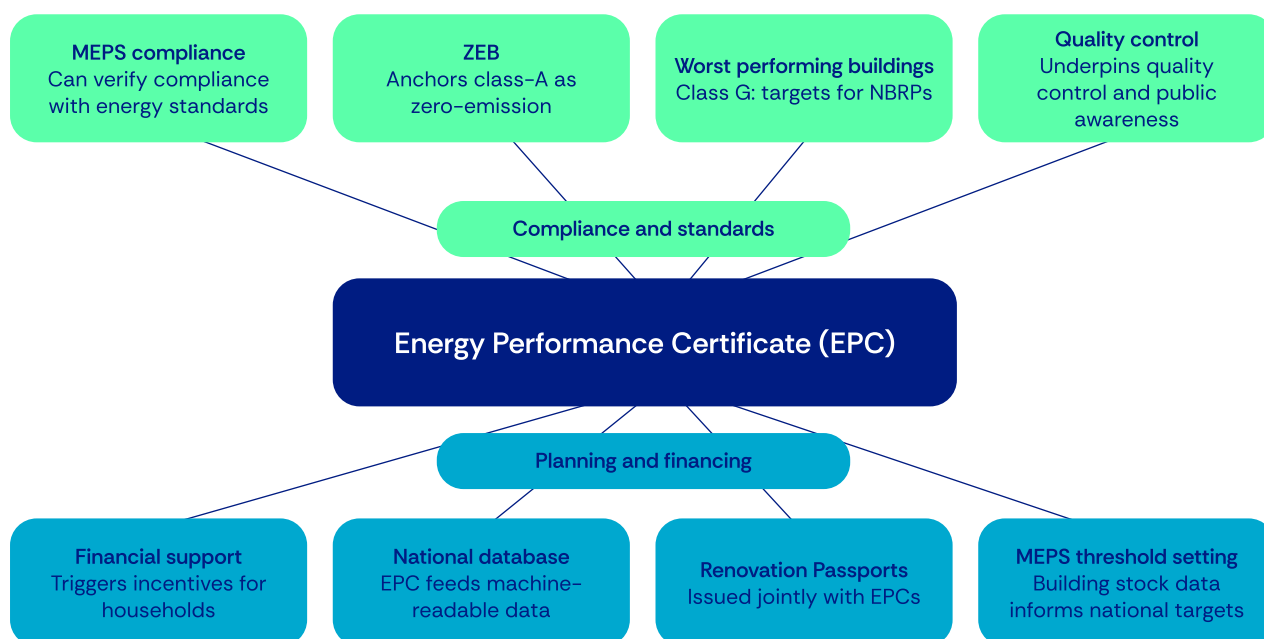
Renovation passports should not be treated as stand-alone documents, but as **practical, user-oriented and updatable roadmaps that connect long-term policy targets with building-level decisions**. Their value depends on integration with EPCs, digital building logbooks, Article 22 building databases, one-stop shops and financing schemes, so that data can be reused, updated and linked to monitoring, reporting and policy evaluation. Member States should define early the legal, digital and governance framework, including data access, software ownership, quality assurance, update responsibilities and institutional roles. Renovation passports are also particularly relevant for public and non-residential buildings, where they can support MEPS implementation, EED Article 6 obligations and staged renovation towards ZEB performance.

3.5 Energy performance certificate

Key characteristics

Energy performance certificates are one of the most established building policy instruments in the EU. Under the recast EPBD, their role becomes even more important. **EPCs are not only information tools for transactions; they can support building stock analysis, identification of worst-performing buildings, MEPS implementation and compliance, renovation advice, financing, monitoring and communication.**

Figure 6. The role of EPCs in EPBD implementation (Source: EPBD.wise)



For EPCs to play this role, they must be reliable, accessible, digital and trusted. Many existing systems still face problems related to data quality, inconsistent methodologies, weak quality control, limited database functionality, generic recommendations and low public awareness. In addition, the revised EPBD reinforces the role of EPCs as a core data source for national building renovation plans, digital building logbooks and the implementation of ZEB targets. This increases the importance of ensuring interoperability, stronger governance, and better integration with financing mechanisms and one-stop shops.

Figure 7. Policy needs related to EPC implementation
(Source: EPBD.wise)



Key insights from focus countries

The EPC-related work carried out in Bulgaria¹⁶, Greece¹⁷, Hungary¹⁸ and Poland¹⁹ highlighted important differences in implementation approaches. However, common challenges emerged across all countries, including fragmented databases, weak quality-control systems, limited actionability of recommendations and low public awareness.

Despite different national contexts, quality assurance and communication consistently emerged as priority areas for improvement. Several countries also identified the need for rescaling EPCs, improving methodologies and strengthening database functionality.

Key insights and recommendations for all Member States

EPBD.wise research identified several priorities for improving EPC implementation across Member States and reinforced the crucial role of EPCs in supporting other EPBD instruments. The main recommendations are to **consolidate governance and databases through centralised, interoperable registers with clear responsibilities, harmonised data protocols and robust data quality checks**. EPC calculation methods and indicators should be standardised and aligned with the ZEB framework, while rescaling should be supported by transparent rules, digital tools and automated validation.

EPC recommendations should become more practical and user-oriented, moving from generic checklists to building-specific renovation pathways linked to one-stop shops, renovation passports and financing schemes. This should be supported by structured training, accreditation and recertification of EPC experts; independent quality control systems using automated, risk-based and on-site checks; and clear enforcement mechanisms. Finally, EPCs should be accompanied by communication campaigns and embedded in monitoring, reporting and evaluation frameworks so that EPC data can help track renovation uptake, policy effectiveness and progress towards zero-emission buildings.

EPBD.wise produced a comprehensive framework for replicating EPC improvements across EU Member States (including self-assessment of implementation levels and tailored replication guidelines) and a decision support tool for each country to quickly assess their level of maturity and possible pathways for improvement.²⁰

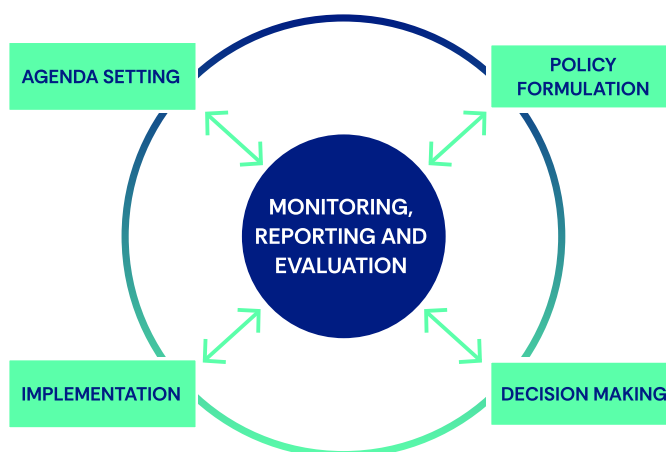
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4

MONITORING AND EVALUATION

Monitoring, reporting and evaluation are essential for effective EPBD implementation. The recast EPBD significantly strengthens data, reporting and planning requirements, especially through NBRPs, EPCs, renovation passports and national databases on energy performance (Article 22). However, **monitoring and evaluation should not be seen only as a compliance requirement but rather used as a policy management tool that enables Member States to assess progress and impact, identify implementation barriers, improve policy design, and ensure that investments and regulatory measures deliver the intended outcomes.**

Figure 8. An integrated policy cycle (Source: EPBD.wise)



The EPBD establishes important monitoring and reporting requirements. NBRPs provide the main reporting framework while Article 22 requires Member States to establish databases on the energy performance of buildings, including information from EPCs, renovation passports, the smart readiness indicator and calculated or metered energy consumption. These national databases are also expected to feed information into the EU Building Stock Observatory.

This creates an important opportunity: instead of developing separate monitoring systems for each instrument, Member States can build a coherent data ecosystem that supports implementation, monitoring and evaluation at the same time.

The EPBD.wise integrated monitoring, reporting and evaluation framework²¹ provides a structured approach for linking policy objectives, indicators, data sources, reporting channels and evaluation criteria. It proposes that Member States start by defining the policy objective of each instrument, then translate this objective into indicators or KPIs, identify the data needed, define who collects and manages the data, and use the results to evaluate whether the instrument is delivering its intended outcomes. Additionally, **monitoring, reporting and evaluation do not happen only at the end of the policy cycle, but are embedded across all stages of the policymaking process.** The EPBD.wise monitoring, reporting and evaluation framework builds on EPBD provisions as well as existing national and EU monitoring and reporting structures, avoiding additional administrative burden for national authorities.

NBRPs are the cornerstone of integrated monitoring, reporting and evaluation. They provide **the framework through which Member States report and monitor the transformation of the building stock.** NBRPs should therefore bring together information on the national building stock, renovation rates and depth, energy savings, investment needs, financing sources, administrative capacity, social impacts, and progress towards targets and milestones. They should also report the thresholds for new and renovated zero-emission buildings, minimum energy performance standards for non-residential buildings and the national trajectory for the residential building stock. Evaluation should then assess whether the policy packages included in the NBRP are sufficient to meet the planned trajectory, whether the measures are coherent with each other, and whether financing and implementation capacity are adequate.

For zero-emission buildings, **monitoring, reporting and evaluation should assess both compliance with national ZEB definitions and progress towards the wider objective of a zero-emission building stock by 2050.** Member States should track the operational greenhouse gas emission thresholds and annual primary energy use thresholds defined for new and renovated ZEBs, the number and floor area of buildings reaching ZEB performance, and the share of new buildings complying with the ZEB standard. Monitoring should also cover the phase-out of fossil fuel-based heating and cooling systems, renewable energy integration, efficient district heating and cooling connections, and, where relevant, life-cycle global warming potential. Evaluation should examine whether ZEB definitions are driving real decarbonisation, whether they are aligned with EPC class A, whether they remain consistent with national energy system developments, and whether market actors have the technical and administrative capacity to implement them.

For Article 9, monitoring, reporting and evaluation are particularly important because MEPS and residential trajectories introduce measurable obligations for the existing building stock. For non-residential buildings, Member States should monitor the identification and renovation of the worst-performing 16% and 26% of the stock, the thresholds applied, the building categories covered, exemptions granted and compliance mechanisms used. For residential buildings, monitoring should track the evolution of average primary energy use, progress towards the 2030, 2035, 2040, 2045 and 2050 milestones, and whether the required share of savings comes from the renovation of the worst-performing dwellings. **Evaluation should go beyond checking formal compliance. It should assess whether Article 9 measures are triggering sufficient renovation depth, whether they are avoiding lock-in effects, whether financial and technical support is reaching the right target groups, and whether social impacts on vulnerable households are being monitored and addressed.**

21. Gokarakonda, S. and Diaconu, D. (2026). An integrated monitoring, reporting and evaluation framework for effective EPBD implementation. Zenodo. <https://doi.org/10.5281/zenodo.20271444>.

Energy performance certificates are both a policy instrument and a core monitoring data source. EPCs can provide information on energy performance class, primary and final energy use, operational greenhouse gas emissions, renewable energy production and life-cycle global warming potential. They can support the identification of worst-performing buildings and contribute to Article 9 implementation, guide renovation decisions and support financing. Monitoring should therefore cover EPC coverage across building types, the number of certificates issued, the distribution of EPC classes, database completeness, data reliability, quality control outcomes, assessor performance and the usefulness of EPC recommendations. Evaluation should assess whether EPCs are trusted by building owners, whether recommendations are specific enough to trigger renovation, whether EPC data is being used by public authorities and financial institutions to guide renovation decisions, and whether EPC systems are sufficiently interoperable with other databases.

Renovation passports require a different but complementary monitoring approach. Since they are designed as building-level roadmaps for staged renovation, monitoring should not stop at the number of passports issued. **Member States should also track the types of buildings covered, whether renovation steps are implemented over time, whether passports are updated after works are completed, whether they are linked to EPCs and digital building logbooks, and whether they connect users to financing schemes, one-stop shops and technical assistance.** Evaluation should assess whether renovation passports help owners make better decisions, improve the sequencing of renovation measures, increase renovation depth, reduce lock-in risks and support progress towards ZEB performance. Particular attention should be given to affordability and accessibility, especially for vulnerable households and owners/tenants of worst-performing buildings.

The most effective monitoring, reporting and evaluation systems integrate data from all EPBD instruments to assess whether policies are driving renovation and improving building energy performance, which requires clear coordination and well-defined responsibilities across national, regional and local levels. This approach should be supported by a robust and interoperable building data ecosystem, centred on the Article 22 databases, that links information from EPCs, renovation passports, inspections, smart readiness indicators and other relevant sources. To strengthen the evidence base for policy evaluation, Member States should complement mandatory reporting with a targeted set of optional indicators that capture implementation barriers, affordability issues and policy effectiveness while remaining practical to collect. Ultimately, **monitoring, reporting and evaluation should be treated as a continuous learning process, with regular feedback loops between monitoring, reporting and policy design helping Member States refine measures, address emerging challenges and improve EPBD implementation over time.**

The main recommendation from EPBD.wise is that Member States should **treat monitoring, reporting and evaluation as part of the implementation architecture of the EPBD.** A strong monitoring, reporting and evaluation framework links objectives, indicators, data systems, reporting channels and evaluation criteria across all key instruments. It reduces administrative duplication, improves policy coherence and allows public authorities to understand whether measures are delivering real and impactful outcomes.

5

CONCLUSIONS AND OUTLOOK

The EPBD.wise project confirms that the implementation of the EPBD should not be understood as a compliance exercise, but as a highly beneficial and needed long-term transformation process. **The EPBD provides a stronger and more integrated framework for decarbonising the European building stock, but its effectiveness will depend on how Member States translate its provisions into coherent, practical and socially fair policy packages.** The real implementation challenge lies in building the governance, data, financing, skills and monitoring systems needed to make the instruments work in practice.

A key policy message emerging from the project is that the EPBD instruments cannot be implemented effectively in isolation. Zero-emission buildings provide the long-term direction, while national building renovation plans coordinate the pathway. Minimum energy performance standards and national trajectories create the regulatory pressure needed to address the worst-performing buildings. Energy performance certificates provide the data and transparency needed for targeting, compliance and monitoring. Renovation passports help translate long-term objectives into practical renovation steps for individual buildings. If these instruments are developed independently, there is a significant risk of policy fragmentation, duplication of efforts and suboptimal outcomes, including potential lock-in effects. Conversely, **an integrated and coherent approach enables synergies between instruments, enhances policy coherence and strengthens the overall effectiveness of the implementation framework.**

The project also showed that ambitious regulatory measures are necessary. Scenario analyses carried out in EPBD.wise highlighted that **minimum energy performance standards and fossil fuel phase-out measures are decisive for reducing primary energy demand and fossil fuel use in line with long-term decarbonisation objectives.** However, regulatory requirements need to be accompanied by enabling frameworks, including financial support, one-stop shops, technical assistance, workforce development, quality control and clear communication. This is particularly important for vulnerable households and owners or tenants of worst-performing buildings, who are most exposed to high energy costs and least able to finance renovation without support.

Several **policy lessons** also emerge for EPBD implementation.

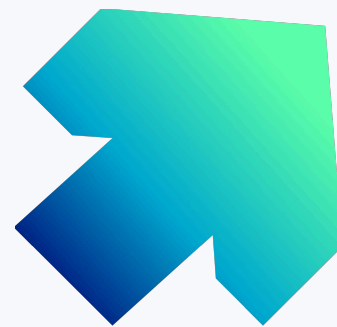
- First, **policy recommendations should start from a clear understanding of policy needs, national contexts and implementation barriers.** The focus-country work showed that Member States differ significantly in terms of building stock characteristics, energy systems, data availability, institutional capacity and market readiness.
- Second, **stakeholder engagement should be embedded throughout the entire policy development process, not used only as a final validation step.** Engagement with policymakers, technical experts and practitioners helped test assumptions, validate findings and further improve the relevance of the policy recommendations.
- Third, **replication requires adaptation rather than direct transfer.** While overarching EU goals can be guided by common approaches and principles, the way they are put into practice needs to be tailored to each country's specific context.
- Fourth, **policy monitoring and evaluation are no longer secondary elements of EPBD implementation.** Monitoring, reporting and evaluation should therefore become part of the implementation architecture of the EPBD and help Member States understand whether policies are delivering results, where adjustments are needed and how implementation can be improved over time.

Looking ahead, EPBD implementation will remain an iterative process, influenced both by **evolving national evidence and by the wider EU policy landscape.** The Fit for 55 package has laid a robust regulatory foundation for transforming Europe's building stock by strengthening energy performance requirements, accelerating renewable energy deployment and initiating the gradual phase-out of fossil fuels in heating and cooling. EPBD implementation should therefore be closely aligned with the implementation of its files, in particular the Energy Efficiency Directive, the Renewable Energy Directive, the extended Emissions Trading System and the Social Climate Fund, rather than treated as a separate policy process. **This alignment will be essential to ensure the consistent application of the energy efficiency first principle, coordinate renewable deployment with renovation cycles, strengthen territorial planning, and embed social safeguards for vulnerable households.**

The experience of EPBD.wise shows that effective EPBD implementation support requires a combination of policy research, building stock modelling, stakeholder engagement, country-specific guidance and EU-level replication.

THE MAIN LESSONS INCLUDE:

- Policy recommendations should start from a careful assessment of national policy needs.
- Implementation pathways must reflect national building stocks, energy systems, data availability and institutional capacity.
- Stakeholder engagement is essential to test whether proposed measures are realistic, acceptable and useful for public authorities and market actors.
- Replication across Europe is possible, but only when common EU principles are adapted to national contexts rather than transferred mechanically.



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