

# EPBD.wise

BRINGING EUROPEAN BUILDING POLICY TO LIFE



## Development of Renovation Passports: Policy Guidelines for Hungary

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## About EPBD.wise

EPBD.wise aims to kickstart action to bring to life the recast European Energy Performance of Buildings Directive (EPBD) as part of making EU climate goals a reality. Over the course of three years, project partners worked with public authorities (such as municipalities, energy agencies, etc.) in six European countries: Bulgaria, Greece, Hungary, Poland, Romania and Ukraine. The overarching aim was to ensure the design, implementation and evaluation of key provisions to ensure EU buildings align with climate goals. Starting with investigation of needs and good practices in the six focus countries, EPBD.wise builds replicable models to support the widespread implementation of effective measures across Europe.

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

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## ABBREVIATIONS AND ACRONYMS

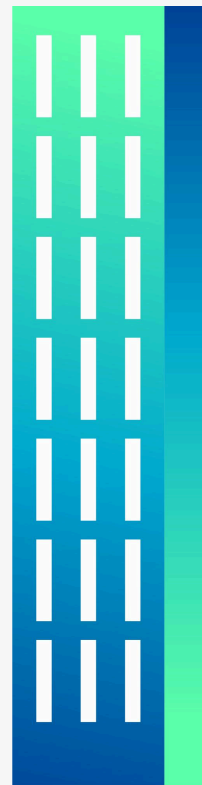
API	Application Programming Interface
EED	Energy Efficiency Directive (EU/2023/1791)
EPBD	Energy Performance of Buildings Directive
EU	European Union
MEPS	Minimum energy performance standards
MÉK	Hungarian Chamber of Architects
MKIK	Hungarian Chamber of Commerce and Industry
MMK	Hungarian Chamber of Engineers
NBRP	National building renovation plan
nZEB	Nearly zero-energy building
RP	Renovation passport (EPBD (2024/1275))
SME	Small and medium-sized enterprises
ZEB	Zero-emission building

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# A RENOVATION PASSPORT FRAMEWORK



## A1 EPBD Article 12: Renovation passport

Article 12 of the Energy Performance of Buildings Directive (EPBD) presents the renovation passport (RP) as a voluntary tool that Member States can decide to make mandatory. Even if the renovation passport remains voluntary at the building level, it is important to develop the national scheme in such a way that it can be applied efficiently and effectively. Article 12 and the detailed Annex VIII of the EPBD provide the requirements for developing the renovation passport scheme, as well as the links to other policy elements, particularly the energy performance certificate (EPC). By 29 May 2026, Member States must establish a national scheme for renovation passports based on the framework in Annex VIII.

## A2 EPBD Annex VIII: Mandatory and voluntary elements

Annex VIII of the EPBD sets out the mandatory requirements for the renovation passport and provides additional information on its optional content. While the scheme is voluntary by default, it is at the discretion of the Member States to enforce it as mandatory. In any case, mandatory elements as shown in Annex VIII must be included.\*

The following tables present the four articles of Annex VIII and their requirements as well as suggestions on how to address them.

\*Please note that the terminology regarding Annex VIII in this report has not yet been aligned with Commission Notice providing guidance on new or substantially modified provisions of the recast Energy Performance of Buildings Directive (EU) 2024/1275. As was the case during the drafting process, this report continues to use the term 'voluntary' with reference to Annex VIII (instead of 'optional' as used in the Commission Notice).

Table 1 Requirements of the renovation passport and suggestions for how to meet them (paragraph 1)

Paragraph 1	Suggestions to meet requirements
<b>The renovation passport shall include:</b>	
(a) information on the current energy performance of the building	Up-to-date EPC
(b) a graphical representation or graphical representations of the roadmap and its steps for a staged deep renovation	Layout design in connection with (d) and (e); standardised suggestions – cost-effective measures
(c) information on relevant national requirements such as minimum energy performance requirements for buildings, minimum energy performance standards and rules in the Member State on the phasing out of fossil-fuel used in buildings for heating and cooling, including application dates	To be complemented by the more detailed provision of paragraph 2 (b) (ii), and in compliance with NBRP
(d) a succinct explanation on the optimal sequencing of steps	Layout design in connection with (b) and (e); optimal sequencing depends on age of elements and maintenance and repair cycles
(e) information about each step, including:	Layout design in connection with (b) and (d)
(i) the name and description of the renovation measures for the step, including relevant options for the technologies, techniques and materials to be used	To be included in the calculation tool
(ii) 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	Estimation with calculation tool
(iii) the estimated reduction of operational greenhouse gas emissions	Estimation with calculation tool
(iv) the estimated savings on the energy bill, clearly indicating the assumptions on energy costs used for the calculation	Estimation with calculation tool
(v) the estimated energy performance class of the energy performance certificate to be achieved following completion of the step	Estimation with calculation tool
(f) information about a potential connection to an efficient district heating and cooling system	Display map with building location (link with energy spatial planning)
(g) the share of individual or collective generation and self-consumption of renewable energy estimated to be achieved after the renovation	Display map with building location (link with energy spatial planning)
(h) general information on available options for improving construction products' circularity and for reducing their whole-life-cycle greenhouse gas emissions, as well as wider benefits related to health and comfort, indoor environmental quality and the improved adaptive capacity of the building to climate change;	Link to one-stop shops Relevant for EU Taxonomy Display map with building location and climate change risks (heat island, heavy rains, flooding)

(i) information on available funding and links to the relevant web pages indicating the sources of such funding;	Link to one-stop shops
(j) information on technical advice and advisory services, including contact details and links to the web pages of one-stop shops.	Link to one-stop shops

Table 2 Requirements the renovation passport may include and suggestions on how to proceed (paragraph 2)

Paragraph 2	Suggestions
The renovation passport may include:	
(a) an indicative timing of the steps	To be included; to be considered in layout design
(b) for each step:	
(i) a detailed description of the technologies, techniques and materials to be used, their advantages, disadvantages and costs	Link to one-stop-shops
(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	To be included; to be considered in layout design Necessary for ESG reporting and proving compliance with EU Taxonomy Necessary for national building renovation plan
(iii) the estimated costs for carrying out the step	To be included: only for the next steps in the correct sequence which are planned for immediate implementation
(iv) the estimated payback period for the step, with and without any available financial support	
(v) the estimated time needed to carry out the	
(vi) where available, the reference values on the life-cycle greenhouse gas emissions for the materials and equipment and links to the relevant web pages where they can be found	Link to one-stop shops for environmental product declarations (EPDs)
(vii) the estimated lifetime of measures and the estimated maintenance costs	To be included: information on extension of building life
(c) independent modules on:	
(i) the typical trades necessary or recommended for carrying out energy renovations (architects, advisors, contractors, suppliers and installer, etc.) or links to the relevant web pages	Link to one-stop shops
(ii) a list of relevant architects, advisors, contractors, suppliers or installers in the area, that may include only those fulfilling certain conditions such as matching higher qualification or certification labels or conditions, or links to the relevant web pages	Link to one-stop shops

(iii) the technical conditions needed for an optimal roll-out of low temperature heating	To be included as renovation scenario
(iv) how the renovation steps and additional measures could improve the smart readiness of a building	To be included as renovation scenario
(v) technical and safety requirements for materials and works	Not part of RP, regulated elsewhere
(vi) the underlying assumptions behind the calculations provided or links to the relevant web page where they can be found	Information to be included
(d) information on how to access a digital version of the renovation passport	Information to be included, e.g. link to EPC database
(e) any major renovations made to the building or building unit, as referred to in Article 8②, and any retrofitting or replacement of a building element that forms part of the building envelope and which has a significant impact on the energy performance of the building envelope, as referred to in Article 8②, where such information is made available to the expert carrying out the renovation passport	Information to be included
(f) information related to seismic safety, where such information relevant to the building is made available to the expert	Display a map with building location and risk assessment
(g) upon request of and on the basis of information made available by the current building owner, an attachment containing additional information, such as the adaptability of spaces to evolving needs and any planned renovations.	Up-to-date drawings and building information (architecture, statics, heating and cooling, electrical, plumbing)

Table 3 The renovation passport and the EPC, and suggestions on how to proceed (paragraph 3)

Paragraph 3	Suggestions on how to meet requirements
Regarding the status of the building prior to the renovation steps, the renovation passport shall consider, to the extent possible, information contained in the energy performance certificate.	Link with paragraph 1(a): set the requirement for an up-to-date EPC as the starting point for the RP and make use of the EPC data

Table 4 The set of standard conditions and suggestions on how to proceed (paragraph 4)

Paragraph 4	Suggestions on how to meet requirements
Each metric used for estimating the impact of steps shall be based on a set of standard conditions.	Estimating the impact of renovation steps requires two estimations: <ol style="list-style-type: none"> <li>1. Based on user behaviour and energy bill</li> <li>2. Based on the standard conditions used for the EPC</li> </ol>

## A3 Connection between renovation passports and energy performance certificates

The RP and EPC are closely connected. Usually, the same dataset about the building, namely up-to-date drawings and building information (architecture, statics, heating and cooling, electrical, plumbing), is the starting point for both the RP and EPC. The RP takes the specific user behaviour and energy cost into account but also needs to provide an assessment under standard conditions, which is in effect an EPC.

There are several options for linking the RP with the EPC:

- 1 The EPC is extended to cover the requirements of Article 12, including Annex VIII. This also involves extending the existing EPC tool, as the RP will substitute the EPC recommendations. The recommendations part of the EPC tool will need to be revised anyway due to the more detailed requirements of the EPBD; this could be done in a way that also complies with Article 12.
- 2 The RP is issued separately, necessitating data exchange between the RP and EPC tools to facilitate the process.
- 3 The digital building logbook is used as the basis for both the RP and the EPC, meaning that an always up-to-date repository of building data is set up and maintained. This can be used as the basis for assessments for RPs and EPCs, as well as ESG reporting or other purposes. The advantage of the third option is that the adaptation of software products will be easier.

In options 1 and 2, data is entered into the calculation directly, meaning that data needs to be re-entered when an updated calculation tool is available. Data exchange between tools is usually hampered by loss of information and the need for corrections. However, the possibilities of reusing EPC data for the renovation passport depend on the quality of EPC data.

There are several issues to be considered:

- EPCs are valid for 10 years, meaning that changes to the building could have taken place during that period, resulting in EPC data being outdated.
- The EPCs issued for existing buildings during rental and sale are often simplified based on the building typology and year of construction (i.e. based on default data), providing little added value for the preparation of the RP.
- Sources of error, such as in the definition of the reference area, can lead to faulty EPCs, which are not always detected by the independent control system.

Regarding EPC revisions, according to EPBD 2024/1275, the focus should be on minimising the scope of interpretation for input data to improve data accuracy and reliability, as this has an impact on the ability to re-use EPC data for the RP. Alternatively, the flow of information could be reversed, with the site visits undertaken during RP preparation feeding into the EPC. This highlights the need for common tools or at least seamless data integration.

## A4 Options for implementing renovation passports

The needs of different stakeholders, as well as the wide range of possible uses of the RP, call for a flexible approach to its implementation: the RP can be introduced as part of the EPC or as a standalone document supplementing the EPC.

Integrating the RP into the EPC offers clear advantages in terms of legal framework and standardisation. On the other hand, developing the RP as a standalone document opens up new possibilities for more comprehensive use, particularly with regard to individual adaptations and specific requirements, such as those that exist in the real estate industry or in complex renovation projects. The RP could also be used for existing buildings to demonstrate that they are on track to meet minimum energy performance standards (MEPS) or nearly zero-energy building/zero-emission building (nZEB/ZEB) targets.

In addition, it may be necessary to develop tailored schemes for detached houses, apartment buildings and non-residential buildings because renovation measures, maintenance processes and financing instruments differ. An additional category of public buildings may be necessary to support the respective part of the NBRP and to use the RP as an alternative approach to meet renovation requirements for public buildings in the Energy Efficiency Directive (EU) 2023/1791.

#### **A4.1 The renovation passport as part of the EPC**

The intention is for the RP to replace the recommendations provided in the EPC.

The EPC is used for the comparative assessment of buildings regardless of user behaviour and is mandatory in certain cases. The RP, however, explicitly takes user behaviour into account, is intended to facilitate refurbishment, and documents all renovation steps. If the RP is established as an integral part of the EPC, an obligation to update the EPC after each renovation step must be introduced as well.

The main advantage of including the RP within the EPC is reduced cost for operating one scheme instead of two (expenses for software, staff, database, control system).

However, benefits will depend on the reputation of the EPC scheme and the quality of the EPC information, which often go hand in hand: if there are trustworthy EPCs (based on high quality and reliable data), the EPC scheme will tend to have a good reputation. In such an environment, it may make sense to extend the recommendation-related part of the EPC, leveraging the well-established EPC scheme, rather than promoting a new RP scheme.

#### **A4.2 The renovation passport as a standalone document**

If the EPC scheme suffers from reputational problems, operating the RP scheme separately may be a viable option, eliminating the problems of the EPC. A separate scheme also makes sense if tailored approaches for certain building types, construction periods and target groups are more effective than the categories provided for in the EPC. Furthermore, the RP has the capacity to address issues that the EPC is not designed to tackle, for example, displaying measures for adapting buildings to climate change. This will serve the broader needs of the real estate industry, helping to prevent assets from becoming stranded.

The main challenge is to define the interface with the renovation planning: where does the renovation passport end and the renovation planning begin?

For the RP to be used effectively by different target groups, it will be necessary to define different types of renovation passports, also in terms of the level of detail. As well as the “simplified renovation passport” proposed in Article 12, the regular renovation passport can be designed with different levels of detail. These levels must be specified and clearly named (for details, see next chapter). Only then can they be implemented effectively.

## A5 Renovation passport implementation frameworks suggested by EPBD.wise

Based on the information presented above, four generic options for RP schemes have been identified, which are described in the following sections. They build on different ways to use the voluntary Annex VIII elements in combination with the mandatory elements, tailored to the needs of specific target groups. The acronyms have been chosen to simplify the discussion about the possible implementation frameworks.

The options developed and recommended by the EPBD.wise project are described in more detail in dedicated sub-chapters below:

- RP scheme in compliance with all mandatory requirements, extended with selected voluntary features
- RP scheme with mandatory (and voluntary) requirements extended with features not listed explicitly in Article 12 and Annex VIII, but in line with the intention of the EPBD recast.

### A5.1 Four generic RP options

There are four basic options, whereby the first one can be divided into two:

- 1 RP scheme in compliance with all mandatory requirements
  - a. Regular RP – ReReP
  - b. Simplified RP – SiReP
- 2 Extended RP scheme in compliance with all mandatory requirements and extended with all voluntary features – ExReP
- 3 RP scheme in compliance with all mandatory requirements, extended with selected voluntary features – SEReP
- 4 RP scheme according to one of the above listed options extended with features not listed explicitly in Article 12 and Annex VIII, but in line with the intention of the EPBD – SEReP+

Table 5 shows the relevance of the various options for the different building types. While ReReP could be used to access financing schemes, SiReP provides a renovation roadmap for homeowners at minimal cost. Depending on the additionally applied criteria, the RP could be used by property evaluators and facility managers, and by public building owners to prove compliance with NBRP and EED-related requirements.

#### Relevant for RP option 1 to option 4:

**Link with the one-stop shop:** As shown above (and also in depth in Annex A), there are many requirements related to the provision of information. To ensure that this information is always up to date, and to keep the cost of the RP low, this information should be standardised as much as possible and be provided by the one-stop shop in the area where the building is located.

Ideally, a function of the RP tool is to enable the expert to select from a list of links to further information on the internet, e.g. addresses of one-stop shops that are updated regularly and, by choice, are incorporated into the specific RP.

**Link with the digital building logbook:** The digital building logbook will be the central source of information for buildings in the future, and RP programmes must reflect relevant developments. Processes will differ depending on who maintains the digital building logbook.

**There are basically two options:**

- Government-led digital building logbook (public administration oversight)
- Private-sector or hybrid digital building logbook (collaboration between public and private entities and/or the chambers of engineers/architects)

*Table 5 Various RP schemes and their relevance for different building types. As ReReP is included in the ExReP, SReReP and SReReP+ variants, these will also be recognised by the financing institutions.*

	ReReP	SiReP	ExReP	SReReP	SReReP+
<b>Non-residential</b>					
Detached house	Financing				
Apartment building	Financing	Renovation roadmap at minimum cost for home-owners	Covers pre-planning stage; could be done on demand	As part of maintenance and repair plan: could be done by inhouse qualified expert (facility manager)  Provides input for property valuation	
<b>Non-residential</b>					
Office	Financing		Covers the pre-planning stage; could be done on demand	As part of the maintenance and repair plan: could be done by inhouse qualified expert (facility manager)	
Health	Financing			Provides input for property valuation	
Educational	Financing				
<b>Public</b>					
Public buildings	Financing				Covers NBRP and EED-related obligations

Generic specifications of option 3 (SReReP) and option 4 (SReReP+) are shown in the next subchapters, because these are the options recommended by EPBD.wise. They are considered essential by EPBD.wise for the success of a renovation passport scheme on the real estate market. Mandatory RP elements according to Annex VIII alone do not meet the needs of important target groups such as facility managers and property valuers, but the inclusion of all voluntary RP elements according to Annex VIII makes the RP expensive, and some elements that are considered crucial to success (e.g. validity period) are even missing from these voluntary elements.

## A5.2 Recommended option: SReReP

The SReReP scheme complies with all mandatory requirements and is extended with selected voluntary features. The recommended selected voluntary features and why they are chosen are shown in Table 6 below.

Table 6 Voluntary features of paragraph 2 Annex VIII to be included in RP scheme

Relevant features of paragraph 2	Suggestions on how to proceed	Justification
(a) an indicative timing of the steps	To be included; to be considered in layout design	Useful information for building owners, facility managers; useful information for NBRP
(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	To be included; to be considered in layout design	Necessary for ESG reporting and proving compliance with EU Taxonomy  Necessary for NBRP
(iii) the estimated costs for carrying out the step	To be included: only for the next measures in the correct sequence which are planned for immediate implementation	Necessary information for building owners, facility managers
(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	To be included: information on extension of building life	Relevant information for property valuation (and thus also financing institutions)
(iii) the technical conditions needed for an optimal roll-out of low temperature heating	To be included as renovation scenario; standardised as much as possible	Necessary to prevent owners from installing inefficient heat pumps
(iv) how the renovation steps and additional measures could improve the smart readiness of a building	To be included as renovation scenario; standardised as much as possible	Necessary to convince building owners to contribute to grid flexibility

(vi) the underlying assumptions behind the calculations provided or links to the relevant web page where they can be found	To be included	Display the type of RP, data sources and tools applied
(d) information on how to access a digital version of the renovation passport	To be included	Link to EPC database and information on how to access

### A5.3 Recommended option: SEReP+

The SEReP+ scheme is extended with features not listed explicitly in Article 12 and Annex VIII, but in line with the intention of the EPBD.

**Necessary features to achieve the expected impact on the property market, which are not listed explicitly in Article 12 and Annex VIII, are:**

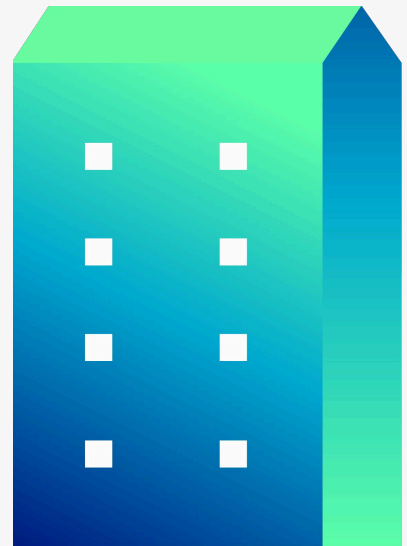
- 1 The RP is updated in the EPC database and the digital building logbook (if available) after each renovation step.
- 2 The updated RP contains detailed information about the next renovation step, and the timing of the planned implementation.
- 3 The RP has a validity of five years. If no measures are implemented within this period, the RP becomes invalid.

The first aspect ensures that the current energy performance condition of the renovated building is represented in the EPC database. This is important because the EPC database becomes the central data repository for developing and monitoring policies, most importantly the NBRP.

The long time horizon until 2050 will bring technological and economic changes, making it impossible to specify technical and economic details for renovation steps in 10 or 20 years. However, it is possible to provide detailed information on the next renovation step within a period of five years. Describing the next renovation step in more detail makes it easier for the building owner to take the necessary actions, increasing the likelihood of implementation.

The third aspect is also related to the long time horizon. If the next renovation step is not implemented promptly, the details will likely become obsolete. The five-year period was chosen to achieve a balance between external developments and the effort required to prepare the RP; it would also be possible to set a shorter validity period of, for example, three years.

# GUIDELINES FOR IMPLEMENTING THE RENOVATION PASSPORT IN HUNGARY



## Executive summary

As part of the Energy Performance of Buildings Directive (Directive 2024/1275), the renovation passport is a key tool designed to guide building owners through the process of staged deep renovation towards zero-emission standards. The RP complements other EPBD instruments such as EPCs, digital building logbooks, minimum energy performance standards (MEPS) and national building renovation plans. This document presents guidelines and implementation recommendations based on national consultations and stakeholder input from Hungary. It outlines how the RP can be effectively integrated into the country's existing policy, regulatory and technical frameworks.

In Hungary, existing and future systems such as EPCs and digital building tools provide a foundation for integrating the RP. However, implementation will depend on the alignment of national policies and institutional roles. For example, in Hungary, the Hungarian Chamber of Engineers and Hungarian Chamber of Architects will take lead responsibilities.

Key recommendations include the need for clear technical definitions, software compatibility and training programmes for local stakeholders. A phased roll-out is recommended, starting with pilot projects, linking the renovation passport to EPC systems, and eventually integrating it into national digital building logbooks. The selection of the appropriate level of detail of the RP scheme, as outlined in this report, should be based on the specific context and building stock. Support mechanisms, including financial incentives, one-stop shops and uniform data interfaces, are critical success factors for effective implementation.

Stakeholder concerns were analysed through questionnaires, roundtables and policy forums, leading to tailored guidelines for country-specific RP implementation. To address challenges in distinguishing mandatory from voluntary elements, new terminology was introduced to clarify definitions and enable targeted implementation based on stakeholder needs and building types.

The core focus is on the development of a step-by-step policy roadmap for RP implementation. Key steps are to i) provide technical and policy support, ii) pilot programmes to test and refine the implementation process, and iii) make iterative updates to accommodate evolving recommendations.

In summary, the RP should be implemented as part of the EPC. However, there are concerns that target groups might be put off by over-complexity. Well-designed digital infrastructure can address this concern and contribute to the implementation of transparent and trackable renovation strategies.

## 1 Introduction

This guideline has been developed to address the specific needs of Hungary in the implementation of the renovation passport (RP) according to Directive (EU) 2024/1275. The Hungarian Chamber of Engineers (MMK) and the Chamber of Architects (MÉK), as the sole authorities responsible for training and quality control of EPCs, play a pivotal role in shaping the RP framework and providing technical guidance to the responsible ministries.

The guidance aims to support effective design, implementation, monitoring and policy evaluation of the RP by outlining a structured approach. Key aspects include developing step-by-step policy guidelines for RP implementation, identifying enabling factors and potential obstacles, and assessing interlinkages with existing policy instruments. Special attention is given to ensuring alignment with the EPC system and leveraging the expertise of the chambers to facilitate a technically sound and administratively feasible roll-out. By integrating technical expertise with policy considerations, these guidelines serve as a strategic tool to support decision-makers in establishing a robust and effective RP framework in Hungary.

### 1.1 Target group and institutional framework

This guideline addresses key stakeholders such as the responsible ministries and the Hungarian Chamber of Engineers and the Hungarian Chamber of Architects and outlines the actions expected by them.

**Responsible ministries** are expected to establish a regulatory framework that integrates the RP into national legislation and to develop financial support mechanisms including incentives and funding programmes.

**Hungarian Chamber of Engineers (MMK) and the Chamber of Architects (MÉK):** As the exclusive authority for training and quality control of EPCs,<sup>1</sup> the Hungarian Chamber of Engineers and the Hungarian Chamber of Architects play a pivotal role in the acceptance and practical implementation of the RP.

**Their responsibilities should include:**

- Actively participating in RP development to ensure technical feasibility
- Providing training programmes for engineers and planners
- Raising awareness among professionals and the public
- Developing technical guidelines for standardising RP applications
- Serving as a coordination hub to facilitate dialogue between policymakers, practitioners and industry stakeholders

### 1.2 Implementation potential and scheme selection

The collaboration between the ministries and the engineering and architectural chambers offers significant potential for effectively implementing the RP.

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1. EPCs are issued by independent experts who have passed the necessary exam at the Hungarian Chamber of Engineers or the Hungarian Chamber of Architects.

This includes selecting mandatory and appropriate voluntary requirements from EPBD Annex VIII for effective RP schemes that balance regulatory compliance with professional flexibility.

A structured approach to RP implementation, supported by technical expertise and financial mechanisms, ensures that the RP is both legally embedded and widely accepted within Hungary's professional and policy framework. By fostering close cooperation between policymakers and the engineering sector, the RP can become a key driver for sustainable and socially inclusive building renovation in Hungary.

## 2 Identified policy needs

The assessment of policy needs in Hungary was based on insights gathered from online calls and a questionnaire, with input provided by the project partner ÉMI. As a key institution for quality control and innovation in buildings, ÉMI offers a valuable perspective on the status quo and the requirements for effective RP implementation. The key findings are summarised below.

### Regulatory and institutional framework

#### Status quo:

- The Ministries collaborate closely with the Chamber of Engineers and Chamber of Architects, whose independent experts are responsible for issuing EPCs.
- The ÉKM Decree 9/2023 (V.25) regulates the integration of the RP into the EPC, effective since 1 November 2023. There is a need for clear technical descriptions, targeted training and digital tools.

#### Policy needs:

- The RP should be supported by a strong technical, organisational and financial framework, including one-stop shops.

### Building stock characteristics and energy performance

#### Status quo:

- The Hungarian building stock consists largely of single-family houses in villages, often built with brick or stone and lacking thermal insulation.
- In large city centres, residential buildings over 100 years old face difficulty in renovation, due to challenges regarding technical standards.
- The primary heating source is gas, following historical reliance on coal and oil. This underlines the necessity for renewable energy integration.
- Zero-energy houses exist but remain rare, highlighting the need for stronger policies to promote energy-efficient construction.

#### Policy needs:

- The diversity of building types (historic buildings, rural homes, and modern zero-energy houses) necessitates a differentiated approach to renovation strategies.

### Financial mechanisms and challenges

#### Status quo:

- Solar panel installation programmes have been in place for three years.
- Home renovation programme: Since July 2024, a home renovation programme has been available for energy modernisation of family houses built before 1990.

- Support is available for residential solar systems or electrification of heating systems in combination with solar. Financial support is available for homeowners with incomes below the national average to assist them in installing renewable energy systems, such as solar panels, and for upgrading energy efficiency in residential properties.
- The Solar Energy Plus Programme provides support for installing household-sized solar power systems.

#### Policy needs:

- Zero-interest loans and non-repayable grants are identified as the most effective measures to stimulate renovation. This insight should be used to reshape funding schemes.

### EPC and RP integration

#### Status quo:

- Since 2013, approximately 1.53 million EPCs have been issued in Hungary according to ÉMI.
- The new 11-page EPC includes an RP component, providing guidance on recommended and mandatory interventions for building owners.
- Lack of knowledge of the application of the new software and the calculation methods according to the ÉKM decree remains a major barrier to efficient implementation.

#### Policy needs: Awareness creation and training

- Public awareness campaigns are necessary to create awareness on legal obligations and to shift the mindset towards holistic renovation approaches.
- Best-practice examples and training can help increase acceptance and understanding of the RP.

#### Policy needs: Data collection and research needs

- There is a need for comprehensive research on the Hungarian building stock, covering different construction periods and typologies, to develop default renovation roadmap typologies.
- Establishing a centralised database would facilitate data-driven policy decisions and improve long-term renovation planning.

The combination of a comprehensive regulatory framework and a diverse, often inefficient building stock underscores the necessity for tailored renovation strategies that address both historic and modern structures. Regarding public buildings, differentiated approaches will be required to effectively align Hungary's renovation policies with its EED commitments. The successful implementation of the RP in Hungary requires a coherent regulatory framework, targeted financial support, digital integration of EPCs and RPs, awareness-raising efforts and improved data collection. Strengthening cooperation between ministries, professional chambers and research institutions will be essential in overcoming current challenges and establishing the RP as an effective instrument for sustainable building renovation.

## 3 The scope of the renovation passport in Hungary

The general part of the EPBD-wise guidance (chapter A) on implementing RP schemes explains the benefits of combining mandatory elements of Annex VIII with different voluntary elements for specific target groups. It also explains the two basic options of 1. introducing the RP as part of the EPC, and 2. introducing the RP as an additional document to complement the EPC.

The RP schemes suggested by EPBD.wise (SReP and SReP+) are also described in more detail. This information is relevant for determining the scope of the country-specific approach.

In principle, the RP should be integrated into the EPC. A central issue in the discussion on EPCs is whether the integration of RPs might make the EPC process too extensive and complex. This concern is particularly relevant for public and historical buildings, which are often exempt from mandatory EPC requirements but may obtain one voluntarily.

The key question is whether energy improvement recommendations can be effectively embedded into the EPC framework without overburdening the process. Another critical aspect is the development and application of digital tools that link renovation roadmaps with EPCs. This raises questions regarding who is responsible for developing these tools, who will use them, and how they will integrate with existing software solutions.

The Hungarian Chamber of Engineers and the Hungarian Chamber of Architects play a crucial role in ensuring that these tools remain practical and user-friendly while maintaining regulatory compliance.

To ensure effective implementation, the integration of RPs into EPCs should strike a balance between providing meaningful renovation guidance and maintaining usability and efficiency. Addressing concerns about over-complexity, technical feasibility and institutional responsibilities will be essential in shaping the future role of EPCs in building renovation strategies.

Looking at concerns regarding over-complexity and technical feasibility, it might be realistic to pursue an RP scheme that mainly focuses on compliance with all mandatory requirements.

## 4 Getting started with tailoring the renovation passport for Hungary

### 4.1 Identify who is driving the process

In Hungary, the responsible ministry is the formal owner of the RP: they set the legal framework according to EPBD Art. 12/Annex VIII and define targets and reporting. The Hungarian Chamber of Engineers (MMK), together with the Chamber of Architects (MÉK), should serve as the technical authority, maintaining guidelines and sequencing rules, accrediting and upskilling assessors, running independent quality assurance, and providing structured feedback to the ministries.

### 4.2 Sources of support

Effective implementation of the RP in Hungary requires structured support from key stakeholders at national and regional levels.

The necessary support can be categorised as follows:

- **Institutional support:** Collaboration between ministries responsible for energy, housing and social policy to ensure legal integration and policy alignment.
- **Financial support:** Access to EU funding, national subsidy programmes and private-sector investments to ensure affordability and uptake.

- **Technical support:** Cooperation with MMK and MÉK to provide expertise in integrating RPs into existing certification frameworks.
- **Social and community support:** Engagement with municipalities, NGOs and local communities to address the specific needs of vulnerable populations, including those in energy poverty.

### 4.3 Get familiar with renovation passport implementation options and select the appropriate one

There are four basic options for integrating and implementing RP schemes, which are tailored to building types and target groups (see chapter A in this report). The following procedure is suggested to decide on a specific approach.

#### Step 1: Evaluating relevant provisions from Article 12 and Annex VIII

- **Mandatory elements:** Assess the requirements outlined in Annex VIII and determine how they should be implemented in the RP framework.
- **Voluntary elements:** Identify optional requirements that can provide additional benefits under specific conditions.
- **Strategic updates:** Ensure that the RP is updated after each renovation recommendation is implemented to maintain relevance and accuracy.

#### Step 2: Coordination with the engineering chamber

- Present the proposed RP framework to MMK and MÉK for validation and alignment with professional standards.
- Define which aspects of Annex VIII should be prioritised in the RP structure to ensure technical feasibility and regulatory compliance.
- Collaborate with software developers to estimate costs and technical requirements for integrating these updates into digital RP systems.

Next steps are to engage stakeholders in a structured dialogue to align policy objectives with technical feasibility, secure funding mechanisms that support mandatory and ideally also voluntary renovation steps, and develop implementation roadmaps tailored to different building typologies so that historic preservation and modern energy efficiency goals are met.

## 5 Development of a roadmap for implementing the renovation passport

The successful implementation of the RP requires a structured roadmap that aligns technical specifications, regulatory requirements and stakeholder engagement. A key milestone in this process is the collaboration with MMK and MÉK, ensuring that the RP specifications are clearly defined and effectively integrated into national building renovation strategies.

A critical aspect of this roadmap is the interpretation and application of Annex VIII, which outlines the requirements. We propose a gradual shift towards mandatory RP updates, which is not yet included in the mandatory requirements, to enhance effectiveness and long-term impact. This approach ensures that energy efficiency improvements are not only recommended but also systematically integrated into renovation planning and can be tracked.

Furthermore, the roadmap includes the elaboration of detailed descriptions of renovation measures, specifying what actions should be taken and how they should be implemented. These descriptions provide clarity for stakeholders, ensuring consistency in execution and compliance.

The five-step roadmap presented below needs to be further detailed for application in Hungary, focusing on integrating the RP into the EPC framework. The Chamber of Engineers and the Chamber of Architects are the key stakeholders, and the steps must emphasise enhancing EPC recommendations with RP elements. A structured timeline and phased implementation approach can establish a robust and scalable RP framework, fostering sustainable and efficient building renovations in Hungary.



## 6 Affordable access to hardware and software

Affordable access to reliable hardware and software is essential for effective energy renovations. By optimising national energy software tools and the EPC database, Hungary can streamline renovation processes, improve energy performance tracking, and support building owners and professionals in implementing phased and cost-effective renovation strategies.

For small and medium-sized enterprises (SMEs), which often operate with limited resources, the cost of software packages can be prohibitive. These tools are essential for feeding databases, creating EPCs and uploading RPs, and they require substantial storage capacity and computing power.

To address these challenges, co-working spaces could be established specifically for SMEs, offering shared access to high-performance hardware and software. This approach reduces individual costs and supports efficient workflows. Additionally, collaboration models could be developed where SMEs rent dedicated desks within larger companies that already provide advanced digital infrastructure and software licences, turning this into a potential business opportunity for technology providers. Cooperation with one-stop shops could also be considered.

The Hungarian Chamber of Commerce and Industry (MKIK) could play a facilitating role by linking firms and promoting partnerships between technology suppliers and SMEs, making access to digital tools both affordable and collaborative.

### 6.1 Technical infrastructure requirements

Priority actions include expanding database capacity for RP data and adding renovation-step fields. On software, APIs should be integrated into RP modules to enable interoperability, and a mobile-friendly interface should be developed along with a comprehensive e-learning system. For hardware, there is a need to increase processing capacity and provide cloud-based redundancy. On security, advanced encryption and access controls should be deployed. Table 1 below shows an overview including a qualitative assessment of priorities.

Table 7 Technical infrastructure requirements and their priorities

Requirement	Detailed requirement	Priority
Database infrastructure	Enhanced database capacity for RP data	High
	Additional data fields for renovation steps	High
Software integration	API integration with RP modules	High
	Development of a mobile-friendly interface	Medium
	Comprehensive e-learning system for training	Medium
Hardware requirements	Enhanced processing capacity	Medium
	Cloud-based redundancy for back-up systems	Medium
Security infrastructure	Advanced encryption and access control	High

Together, these upgrades create a resilient, interoperable foundation for nationwide RP roll-out, secure, scalable, and ready for smooth adoption by experts and end-users.

## 2.6.2 EPC database modifications

The EPC database needs targeted enhancements that capture building context, stepwise renovation logic and verifiable performance outcomes. The additions below focus on information needed to plan, finance, implement and track staged renovations with consistency and auditability.

Table 8 Overview of necessary EPC database modifications

Enhancement category	Detailed requirement	Impact
Building information	Heritage status, seismic information, building typology	Medium
	Stepwise implementation schedule and milestones	Low
Energy performance data	Current and target performance levels, stepwise improvements	High
	Progress tracking and performance verification	High
Renovation steps and cost estimates	Detailed renovation measures, sequencing, dependencies	High
	Cost per step, funding options, payback periods	High
	Material specifications, technical standards, compliance	Medium
	Documentation of technical standards, permits, and certificates	Medium

These modifications turn the EPC database into a living backbone for the RP, linking plans to verified results, enabling financing and compliance, and ensuring transparent, end-to-end traceability.

## 6.3 Nine key steps for affordable access to hardware and software in Hungary

The following technical steps are recommend to keep set-up and maintenance costs low:

- Implement a modular system for gradual upgrades.
- Use cloud-based solutions to minimise hardware costs.
- Develop a mobile-friendly interface to enhance accessibility.
- Strengthen security protocols while ensuring user-friendly access.
- Use open-source components where appropriate.
- Upgrade the EPC database to accommodate new RP data fields and expand the EPC database to include renovation steps and timeline tracking.
- Add fields for cost estimation and funding options.
- Include a repository for technical documentation.
- Implement monitoring capabilities for performance verification.

## 7 One-stop shops

One-stop shops function as centralised service hubs that provide building owners, professionals and policymakers with comprehensive guidance, information and administrative support for energy renovation projects.

In Hungary, where rural and urban areas exhibit significant differences in building stock, technical capacities and access to resources, establishing an efficient network of one-stop shops is critical for the successful implementation of the RP.

## 7.1 One-stop-shops and renovation passport schemes

In the context of RPs, one-stop shops serve several key functions. They standardise renovation information, ensure regulatory compliance, and reduce administrative burdens through automated tools. They assist in selecting appropriate RP schemes and provide access to financial incentives, technical guidance and regulatory support. To enable effective and cost-efficient RP deployment, one-stop shops should be established as the primary infrastructure for information management and technical support.

The following considerations are key:

- **Digital integration:** One-stop shops should feature an automated platform for professionals and property owners to access regionally updated funding opportunities, technical guidance and best practices.
- **Geographical challenges:** Given Hungary's rural-urban divide, tailored one-stop shop structures are necessary to ensure accessibility in remote areas.
- **Centralised coordination with local adaptations:** National coordination should be maintained while allowing regional adaptations to address varying climate, infrastructure and policy conditions.

## 7.2 One-stop shops in rural areas

For rural areas, a hybrid model that combines centralised digital platforms, regional service hubs and mobile consultation units could be explored. Leveraging digital solutions for information access, regional centres for technical support and mobile teams for on-site consultations could enable equal access to renovation services and expertise, addressing the unique needs of rural communities while maintaining cost-efficiency.

## 8 Digital building logbooks

Hungary has implemented an Electronic Construction Log (e-Log) system [*“a documentation being kept from the beginning until the completion of a project, containing all relevant data on construction activities in chronological order, information on the adequacy and certifications of works, as well as data relevant for financial settlement.”*]

This system has been mandatory for most construction projects since October 2013.<sup>2</sup> It facilitates the electronic administration of building matters, aiming to increase flexibility, transparency and compliance throughout the construction process. The e-Log serves as a digital repository for construction-related documentation, including daily logs of building activities, task reports, and attendance records of workers and professionals involved in the project.

However, the e-Log primarily focuses on the construction phase and may not encompass the comprehensive life-cycle data envisioned in a digital building logbook<sup>3</sup> as mentioned in the EPBD.

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2. [www.mondaq.com/construction-planning/452924/recent-changes-in-the-hungarian-construction-law-mandatory-use-of-an-electronic-construction-log-e-log](http://www.mondaq.com/construction-planning/452924/recent-changes-in-the-hungarian-construction-law-mandatory-use-of-an-electronic-construction-log-e-log)

3. [www.construction-products.eu/publications/digital-building-logbook](http://www.construction-products.eu/publications/digital-building-logbook)

A digital building logbook is intended to serve as a common repository for all relevant building data, facilitating transparency, informed decision-making and information sharing among stakeholders such as building owners, occupants, financial institutions and public authorities.

Hungary does not have a fully developed digital building logbook that covers the entire life cycle of buildings. The existing e-Log system could potentially serve as a foundation for developing a more comprehensive digital building logbook in the future, aligning with European Union initiatives to encourage deep energy renovations and overcome barriers in building renovations<sup>4</sup>.

## **8.1 The role of the digital building logbook in renovation passport implementation**

The digital building logbook is envisioned as the centralised repository for building-related data, integrating information on energy performance, renovation history, material use and regulatory compliance. As Hungary advances its digitalisation efforts in the construction and renovation sectors, ensuring a seamless link between RP schemes and the digital building logbook is essential for the cost-efficient and transparent implementation of EU policies. Expanding the e-Log into a fully functional digital building logbook could serve as the foundation for future integration with RP schemes, facilitating efficiency in data collection efforts and ensuring that all renovation efforts are recorded and aligned with national and EU energy efficiency targets.

The specific design of the linkage between the RP and the digital building logbook will depend on the entity responsible for set-up and maintenance of the logbook. There are basically two options, the government-led digital building logbook (public administration oversight), and the private-sector or hybrid digital building logbook (collaboration between public and private entities and/or the Chambers of Engineers/Architects).

## **8.2 Making the RP work with the digital building logbook: standards, automation, roles**

To make the RP work seamlessly with the digital building logbook, the data model and processes must be aligned end-to-end with standardised fields, automated updates, clear linkages to finance and regulation, and role-based access, so that each stakeholder can act on reliable, up-to-date information.

- **Standardised data fields and interoperability**
  - The RP must be structured so that relevant data (e.g. renovation steps, CO<sub>2</sub>eq reductions, financial calculations) can be directly linked to the digital building logbook.
  - Standardised formats should ensure compatibility across RP tools and digital building logbook infrastructure.
  - Alignment between the EPC database, RP and digital building logbook should minimise redundant data entry and ensure consistency.
- **Automatic updates and version control**
  - The digital building logbook must support real-time tracking of energy performance improvements.
  - Version control mechanisms should log past and ongoing renovation measures, ensuring an accurate historical record.

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4. [www.mdpi.com/2075-5309/13/4/1082](https://www.mdpi.com/2075-5309/13/4/1082)

- **Integration of financial and regulatory information**

- The digital building logbook should link to funding schemes, tax incentives and subsidy options for informed decision-making.
- Automatic updates should reflect changes in minimum energy performance standards and regulatory shifts.

- **Access and user rights management**

Access roles should be defined for different stakeholders:

- Building owners: View and update renovation progress.
- Energy experts/auditors: Input technical data and validate RP/EPC information.
- Public authorities: Monitor compliance and policy effectiveness.
- Financial institutions: Assess eligibility for funding.

**By linking the RP with the digital building logbook, Hungary can:**

- Ensure long-term tracking of renovations and energy performance improvements
- Enhance regulatory compliance through automated updates and centralised data
- Improve financial planning by integrating funding opportunities within the RP framework.

Expanding Hungary's existing e-Log system into a fully functional digital building logbook will be crucial for achieving these goals. A well-integrated RP- digital building logbook system will support data-driven renovation strategies, streamline compliance with EU directives, and foster a smarter, more sustainable building sector.

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