Interreg
Baltic Sea Region

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ENERGY TRANSITION
RenoWave

EXTENDED ENERGY PERFORMANCE CERTIFICATES, EPC, INCLUDING ROADMAPS FOR ENERGY RENOVATIONS

A guide for assisting homeowners in energy efficiency by improved use of Energy Performance Certificates.

RenoWave project

Version 2

2025-02-06

About RenoWave

CLIMATE-NEUTRAL SOCIETIES

The project “One-Stop-Shop extended model to increase the multi-apartment building stock renovation in the BSR” (RenoWave) establishes cooperation among homeowners, construction companies, energy agencies, and public authorities to initiate more energy-efficiency renovations in multi-apartment buildings. The main result of the RenoWave project will be a One-Stop-Shop (OSS) model that includes traditional and additional OSS services that cover all the steps necessary to initiate and implement energy-efficiency renovation projects in multi-apartment buildings. The RenoWave project is implemented under the Interreg Baltic Sea Region Program 2021-2027 with the support of the European Regional Development Fund. Implementation time of the RenoWave project is January 2023 to December 2025.

Project partners

1. County Board of Dalarna (Sweden)
2. City of Lappeenranta (Finland)
3. Vidzeme Planning Region (Latvia)
4. Association of Communes and Cities of Małopolska Region (Poland)
5. Magistrat of the City Bremerhaven (Germany)
6. Baltic Environmental Forum Latvia (Latvia)
7. Housing Initiative for Eastern Europe (Germany)
8. Let’s renovate the city NGO (Lithuania)
9. Polish Foundation for Energy Efficiency (Poland)
10. North Sweden Energy Agency (Sweden)
11. Development Centre of Võru County (Estonia)

www.interreg-baltic.eu/project/RenoWave

The project RenoWave establishes cooperation among homeowners, construction companies, energy agencies, and public authorities to initiate more energy-efficiency renovations in multi-apartment buildings.

Summary of the guide

The guide gives advice and recommendations on how Energy Performance Certificates, EPC, for multi apartment buildings can be improved. The guide target OSS service providers supporting multi residential buildings in energy efficiency implementation. The guide include:

- Motives for high quality EPCs
- Guide in procurement of EPCs
- Guide on recommended content of EPCs
- Guide on presentation of EPCs
- Guide on presenting EPC together with a renovation passport

Experience shows that HOMABs receiving an improved EPC with clear measures to achieve a higher energy class, along with a roadmap for implementation, are more likely to take energy efficiency actions.

One solution does not fit all

The use of EPC differs between countries. The content and design of an EPC report needs to be adopted to national context and traditions. This guide therefor gives good examples of different elements of an EPC, rather than proposing a template to fit all.

The development of the solutions

The solutions for improved EPC model have been developed by the RenoWave project in cooperation with energy experts in Sweden, Finland, Estonia, Latvia, Poland and Germany.

Policy recommendations

National authorities should raise the requirements on the use of as well as the content and the quality of EPCs. New standards should be developed together with energy auditors issuing EPCs.

National databases with easily access to building data and registered EPC should be made available.

Introduction

An improved model for Energy Performance Certificates can support HOMABs to take decision on energy efficiency measures.

This guide points out ways for how an OSS can improve the EPC tool, by providing good practice examples.

Background

The EU Renovation Wave strategy aims to achieve 'faster and deeper' renovation in the EU's buildings. In this context, the strategy identifies energy performance certificates (EPCs) as pivotal information tools. The recommendations presented in EPCs are the first step towards buildings' better energy performance.

EPC were introduced in the European Union to support reaching energy efficiency targets by informing actors in the building sector about energy efficiency in buildings. The implementation of EPCs schemes is diverse among the member states.

As the information conveyed by the EPC allows an estimation of building energy demand, it can serve as a powerful instrument to create a demand-driven market for energy-effective buildings. It can serve also as an important source for quality data, on local/regional/national level, about the building stock and to identify the least efficient buildings.

EPCs are the most valuable information source in terms of building energy performance as only professionals and experts are authorized to generate them. They allow benchmarking of energy performance and provide information that can motivate building owners to renovate and implement energy efficiency measures.

However, the coverage of EPCs is still limited, at least in some member states. And the potential for using EPC as a crucial tool for supporting energy efficiency in buildings is not yet fully exploited.

Opportunities

The EPC can, to a larger extent, provide building owners and individuals with trustworthy information about the building condition, energy performance, potential energy savings and how the energy use can be influenced.

Building data from EPCs can, if collected in a uniformed and smart digital way, provide important data about the building stock and point out the least efficient buildings, making also benchmarking between buildings possible.

Information about energy saving possibilities can, if presented in an easily understandable way, be the starting point for individuals to take decisions on energy saving measures.

By pointing out additional values from energy efficiency beyond reduced energy costs in the EPC, for example increased property value and better conditions for bank loans, the motivation can increase.

The problem that needs to be addressed

Even in member states with requirements for all HOMABs to have an EPC, many lack it and HOMABs often do not experience that they create added value.

→ *The added values that can be created by EPC need to be shown.*

The quality of EPCs vary due to different competences among certifiers and due to the fact that HOMABs have a tendency of wanting to pay as little as possible for an EPC, just to meet legal requirements.

→ *Quality requirements for conducting an EPC needs to be set.*

It is difficult for HOMABs to know how to order an EPC.
→ *HOMABs needs guidance in how to order an EPC.*

EPCs often lack well defined and calculated possible energy measures.
→ *Standards are needed for how proposed energy measures should be presented.*

The HOMAB don't get a clear view of the potential in reaching higher energy class
→ *Models are needed on how existing and potential energy class can be presented in a pedagogic way.*

It is challenging for a person without energy expertise to understand the content of an EPC.
→ *EPC reports should be presented in an easy understandable way.*

The HOMAB get a single document without a clear plan how to implement the full renovation journey.
→ *EPCs should be presented together with a plan on how to implement possible measures.*

The Energy Performance of Buildings Directive

According to Article 19 in the new Energy Performance of Buildings Directive, the following requirements are set for Energy performance certificates:

- Member States shall ensure that EPCs are issued by independent experts on the basis of an on-site visit, which may be carried out, where appropriate, by virtual means with visual checks. The EPC shall be clear and easily legible, available in a machine-readable format.
- The EPC shall include recommendations for the cost-effective improvement of the energy performance and the reduction of operational greenhouse gas emissions and the improvement of indoor environmental quality of a building.
- The recommendations included in the EPC shall cover (a) measures carried out in connection with a major renovation of the building envelope or technical building system or systems; and (b) measures for individual building elements independent of a major renovation of the building envelope or technical building systems.
- The recommendations included in the EPC shall be technically feasible for the specific building and shall provide an estimate for energy savings and the reduction of operational greenhouse gas emissions. They may provide an estimate for the range of payback periods or costs and benefits over its economic life cycle.
- The recommendations shall include an assessment of whether the heating systems, ventilation systems, air-conditioning systems and domestic hot-water systems can be adapted to operate at more efficient temperature settings.
- The recommendations shall include an assessment of the remaining lifespan of the heating system or air-conditioning system.
- The EPC shall provide an indication as to where the owner or tenant of the building or building unit can receive more detailed information, including as regards the cost-effectiveness of the recommendations made in the energy performance certificate. The evaluation of cost-effectiveness shall be based on a set of standard conditions, such as the assessment of energy savings and underlying energy prices and a preliminary cost forecast.
- Renovation passports should be encouraged and made available, as a voluntary tool. Since there are some synergies between renovation passports and energy performance certificates, they can be drawn up jointly by the same expert and issued together.

Target group

The target group for this guide is an OSS with the role to support HOMABs in reaching higher energy efficiency. The OSS can either have the competence to issue EPC by themselves or to support HOMABs in procuring an EPC from another certified expert. The OSS can also have the competence to issue Renovation Passports.

Solution: List of motives for a HOMAB having a high-quality EPC

There is several arguments for a HOMAB to have a high-quality EPC, it can:

- Increase the chance that energy efficiency will be implemented.
- Provide more clear information on how to reduce energy consumption and energy costs.
- Be used to easier convince apartment owners if easily understood.
- Ensure compliance with legal requirements.
- Serve as a solid basis when negotiating terms with banks.
- Meet criteria to be eligible for funding.
- Make the HOMAB more attractive if an EPC can prove high energy efficiency, which increase the market value.

Solution: Supporting HOMABs in procuring an EPC

When a HOMAB is procuring an EPC, it should obtain tenders from at least three different suppliers. For some countries, for example Latvia, this is a requirement for receiving state grants. A list of approved/qualified certifiers is useful to have access to when sending out requests for tenders. In most countries this is available from national level.

The request for tenders should be structured similarly to ensure that the tenders are comparable.

The formal part of the request for tenders should include:

- Client and their contact information
- Information about the buildings and their technical systems, including information if it is a historical building under special regulations
- Description of the expected content and quality of the EPC, *see below.*
- Specification of requirements for final delivery
- Form of compensation
- Timeline for the assignment
- Description of how bids will be reviewed and evaluated
- Requirements for the format and content of tenders:
  - Tenderer and their contact information
  - Brief company description, including availability, previous experience with similar assignments, proof of being a certified energy

expert, and education and experience of the individuals who will carry out the EPC
- CV and reference projects for the individuals conducting the energy performance certificate
- Description of implementation
- Prices

- Requirement when conducting the EPC, that a site visit where the building and its installations are reviewed by the energy expert together with a representative from the HOMAB should be carried out.
- Requirement that, in addition to delivering a written report, the energy certifier shall present the contents of the EPC verbally to the HOMABs and also be available for questions.

Solution: Improving the content of an EPC to create higher value

The new EPBD introduces new improvements for the energy performance certificates. Member States are required to use a scale from 'A' to 'G', where 'A' corresponds to zero energy building standard and 'G' represents the very worst-performing buildings at national level. The directive introduces a common template for EPCs that needs to be filled in with numeric indicators of both primary and final energy use and reference values for comparison purposes.

The new EPBD directive also call for widen the scope of EPC recommendations, providing more details on the energy savings and operational greenhouse gas emissions reduction potential, the improvement of indoor environmental quality, financial incentives and benefits, possible alternatives for the replacement of heating and cooling system, and others.

Based on experiences from the RenoWave project there is a potential to create a lot more values from an EPC, by improving the quality and to widen the scope.

The system and requirements for EPC vary among countries. For example, in Germany there are two types: Energy Demand Certificate vs. Energy Consumption Certificate.

The project gives the following recommendations for the content of an EPC:

- General building data, including location, type of building, total area, heated area etc.
- All bought energy presented for different energy sources, per year and month. Share of renewables. (In Germany there is a requirement that 65% of used energy should come from renewables)
- Own energy production and share of renewables.
- All energy use measured or calculated and distributed to different energy entities; Heating, Cooling, Mechanical ventilation, Lighting, Pumping, Tap hot water, Other. When applicable also energy used

for common laundry rooms and vehicle heater and charger should be included.

- Graphs presenting how different energy sources are distributed for different energy entities.
- Energy unit prize for each energy source.
- Assessment of building condition and indoor climate. In addition, when applicable also smartness of technical building installations can be included.
- If obligations for inspection of ventilation and cooling systems have been met.
- National energy performance requirements
- Total Energy performance for the building in terms of real energy use and primary energy use per m^2, including what energy class it corresponds to.
    - Key data on Energy Demand: Final Energy Demand
    - Key data for Energy Consumption: Primary Energy Consumption
    - CO2-Emissions
- Possible energy measures related to operations, maintenance, and investment presented with the following calculations:
    - Description of measures tailored to the property owner's knowledge level.
    - Estimation of investment cost.
    - Calculation of energy cost savings and CO2 savings according to the agreed calculation method.
    - When applicable a description of added value associated with the possible measures.
    - When applicable a description of the need for further studies/calculations.
- Reference values to allocate the own building in a range between similar buildings in different conditions (renovated, partly renovated, not renovated)
- Recommendations of what measures to implement and in what order, including if the building should go for step-by-step renovation or deep renovation.
  Bundling of measures and a proposal for prioritizing measures, along with an illustration of the measures' impact on the buildings' energy class. When bundling, consideration should be given to any planned maintenance measures.

In practice this means that in most cased an extended EPC may be equal or deliver similar information as an energy audit. An extended EPC report will most likely have significantly more pages than a traditional EPC, meaning also that the cost will be higher. It is therefor even more important to promote the additional values of an extended EPC.

Solution: Presenting EPC

Presenting an EPC in a way that homeowners can understand the information is critical to make value of the content.

Do's (Good Practices)

Use Clear and Simple Language

- Explain technical terms in plain language (e.g., "heat loss" instead of "thermal transmittance coefficient").
- Use analogies where helpful (e.g., "Improving insulation is like wearing a winter coat—it keeps the warmth inside").

Visualize the Data

- Use charts, graphs, and color coding to highlight key points
- Energy efficiency classes (A-G) should be clearly marked using color scales similar to energy labels on appliances.
- Provide before/after pictures of similar renovation projects.

Focus on Financial and Comfort Benefits

- Show potential cost savings per year in € or % (e.g., "You could save up to €500 per year on heating").
- Highlight the impact on comfort, health, and property value (e.g., "Fewer drafts, no mold, increased apartment value").

Compare "Current vs. Planned" Scenarios

- Show side-by-side comparisons of energy consumption, costs, and efficiency
- Use real examples or case studies of similar but renovated buildings.

Provide Clear Next Steps

- Outline a step-by-step process for HOMABs, including funding options, available support, and deadlines.
- Use a simple decision flowchart like:
  - Step 1: EPC
  - Step 2: Financing options
  - Step 3: Contractor selection
  - Step 4: Implementation

Don'ts (What to Avoid)

Avoid Overloading with Technical Data

- Too many formulas, equations, or complex energy efficiency terms without explanations.
- Excessive tables with too much raw data—use summaries instead.

Don't Make It All About the Numbers

- Avoid focusing solely on energy savings without explaining why it matters for HOMABs.
- Instead of just listing "Savings: 15%," add context like "This means €300 less on heating per year".

Don't Use Confusing or Unclear Visuals

- Avoid small, cluttered graphs with unreadable labels.
- Don't use too many colors or inconsistent scales (e.g., bar charts with different baselines).

Solution: Presentation of energy measures with calculations

The way measures are presented in EPCs is crucial for a HOMAB. Each measure should be explained in a more detailed and easily understandable way, but there is also a need to make a summary of proposed measures. The summary should include critical facts as investment costs, energy and cost savings as well as cost efficiency.

The RenoWave project recommend the following data to be included, *giving only examples of measures* from different categories:

Measure category	Measure	[CO_2/ year]	[kWh/ year]	[€/ year]	Invest-ment cost [€]	Payback time [year]	Internal rate of return [%]
Building envelope	Wall thermal insulation	30 800	91 500	8 440	135 400	16,05	3,75
Building envelope	Exterior windows replacement	1 800	5 400	450	15 600	34,06	-
Building envelope	Seal windows	3 920	70 000	7 000	26 500	3,8	25
Heating	Renovation central heating system, replacement of water pipes, system adjustment.	87 700	260 000	8 750	33 300	3,8	25,39
Lighting	Replacement to LED	116	167	27	300	11,2	4,01
Tap water	Install flush efficient mixers and shower nozzles	952	17 000	1 700	3 090	1,8	50
Heating source	Replacement of coal boiler with air source heat pump,	4 825	13 746	-	6 800	-	
Energy production	Installation of a 9 kWp photovoltaic system on part of the building's roof.	5 100	7 449	1 100	19 200	15,3	

Payback time method explained

This method works out how long it takes to recover the amount invested (reimbursement period). The advantage of the method is that it is easy to use and understand. The disadvantage is that it encourages short-term investments because it does not consider technical lifetime and interest. The method is often misleading for investments with a long reimbursement period such as solar cells, thermal insulation, window replacement, etc. Therefor this method is not so suitable for use in the building sector.
Investment (€)
Saving (€/year)
Payback time (years)

The internal rate of return method explained

This method compares the cost of investment with the cost of capital. The required rate of return from the investor or interest rate from the bank on a loan decides about the internal rate. If the investment generates a higher rate of return than the cost of the capital to do the investment, then the investment is considered to be profitable. This calculation method has advantages when evaluating investments with long lifetime.

Example: Energy-saving measures are calculated to generate an annual saving of € 5 000/year and require an investment of € 20 000. The period of calculation is 10 years and required rate of return is 8 %.
The internal rate of return will be: 21 %
Since the internal rate of return will be higher than the required rate of return, the investment is considered to be profitable.

Financial calculation tools
A tool for creating financial calculations has been developed by EFFECT4buildings project and can be found here: [Financial Calculations - Effect4buildings]

Solution: Presentation of measures with easy-to-understand graphs

An example how an overview of measures can be presented in an easy understandable way is the current and future target energy status graph in the IRR (iSFP) from Germany, adapted from BMWK master IRR and designed here for the special needs of HOAs by Simon Richter and Julia Lawrenz from ifeu Institut (GER).

Sources: Lawrenz, Julia (2023): Green Home. Ergebnisse eines konzeptionellen WEG-Sanierungsfahrplans. ifeu - Institut für Energie- und Umweltforschung Heidelberg gGmbH, 20[illegible]2022): Optimierung des individuellen Sanierun[illegible]ngebä[illegible]sterarbeit an de[illegible] Hochschule für Techni[illegible]2022[illegible]d.): Musterbeispiel: Mein [illegible]Online[illegible]e: https://www.bmwk.de[illegible]wnloads/S-T/sanierungsfahrplan-muster.pdf?__blob=pu[illegible]BMWK (n.d.): Musterbeispiel: Umsetzungshilfe für m[illegible]Online available:https://www[illegible]n/DE[illegible]s/S-T/sanierungsfahrplan-[illegible]?__blob=publicationFile&v=1

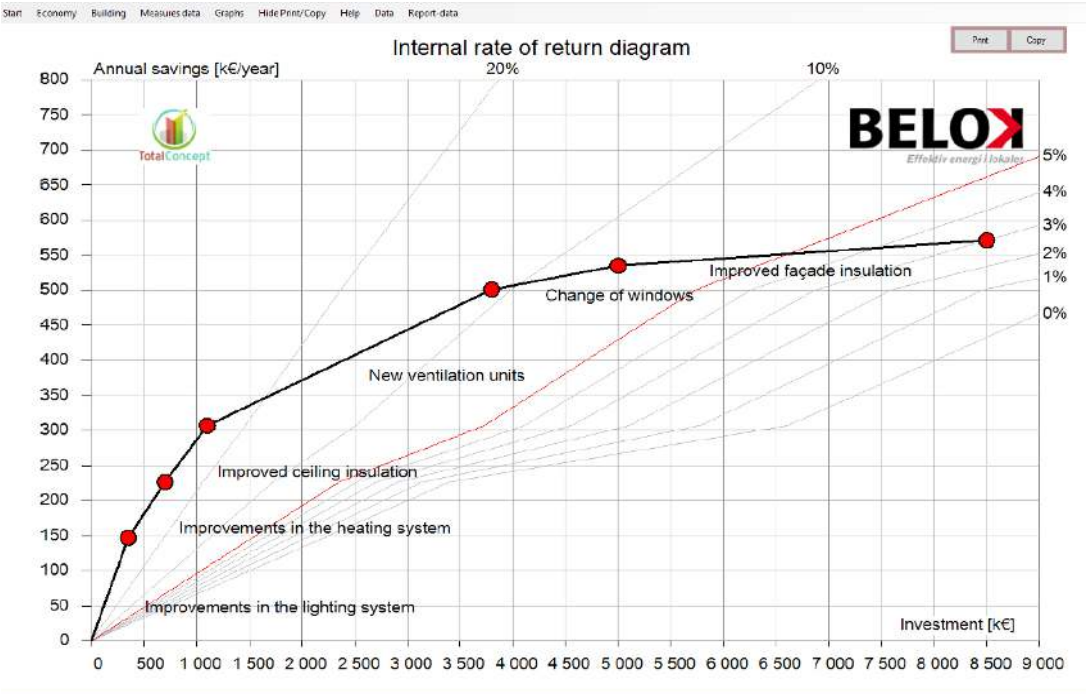
Solution: Presenting how to bundle investments

An energy audit or an extended EPC typically results in a comprehensive list of potential measures across various categories, some more profitable than others. These measures are often interdependent, with one measure affecting another—and vice versa. As mentioned earlier, how these measures are presented and calculated plays a crucial role in determining the building's energy efficiency outcome. The profitability of a measure often determines whether it will be implemented or not.

When decision-makers evaluate individual measures, there is a risk that only the most profitable ones will be prioritized, while many measures that could enhance energy efficiency may be overlooked. This risk is mitigated by using the Total Concept Method. The Total Concept Method combines measures into a cohesive package. The most economically viable measures support less profitable ones, enabling the entire package to meet the property owner's profitability requirements. By adopting a package-based approach instead of assessing individual measures separately, actions that would have been unprofitable on their own can be included, contributing to greater overall energy efficiency.

A guide for bundling of investments can be found here [Bundling - Effect4buildings]
More information and tools for using Total Concept Method in English can be found here [http://totalconcept.se/].

This is an example, illustrating measures with different profitability (internal rate of return) and what a package with all the proposed measures bundled as one package will deliver as internal rate of return.



Solution: Presenting existing and potential energy class

For each building a potential energy class can be calculated, taking in consideration all the different aspects of the actual building type and its location. A maximum potential for increasing energy efficiency and reducing GHG-emissions can be determined by calculating type of measures. If it is a historical building, there might be limited possibilities for insulation of walls, installation of solar panels etc. This calculation of maximum potential is explicitly done without a profitability calculation.

The maximum potential energy class that can be reached, can be compared to the actual energy class concluded in an EPC. To present this in a pedagogic way for the building owners gives opportunities to benchmark and set goals for energy efficiency.

An example for a German Jugend style multi-apartment building

An example of how to present existing and potential energy classes has been developed by Magistrat der Stadt Bremerhaven in the RenoWave project. Wilhelminian (Jugendstil) style multi-apartment building was selected as a calculation example, which is the dominant building type in the German project pilot area.

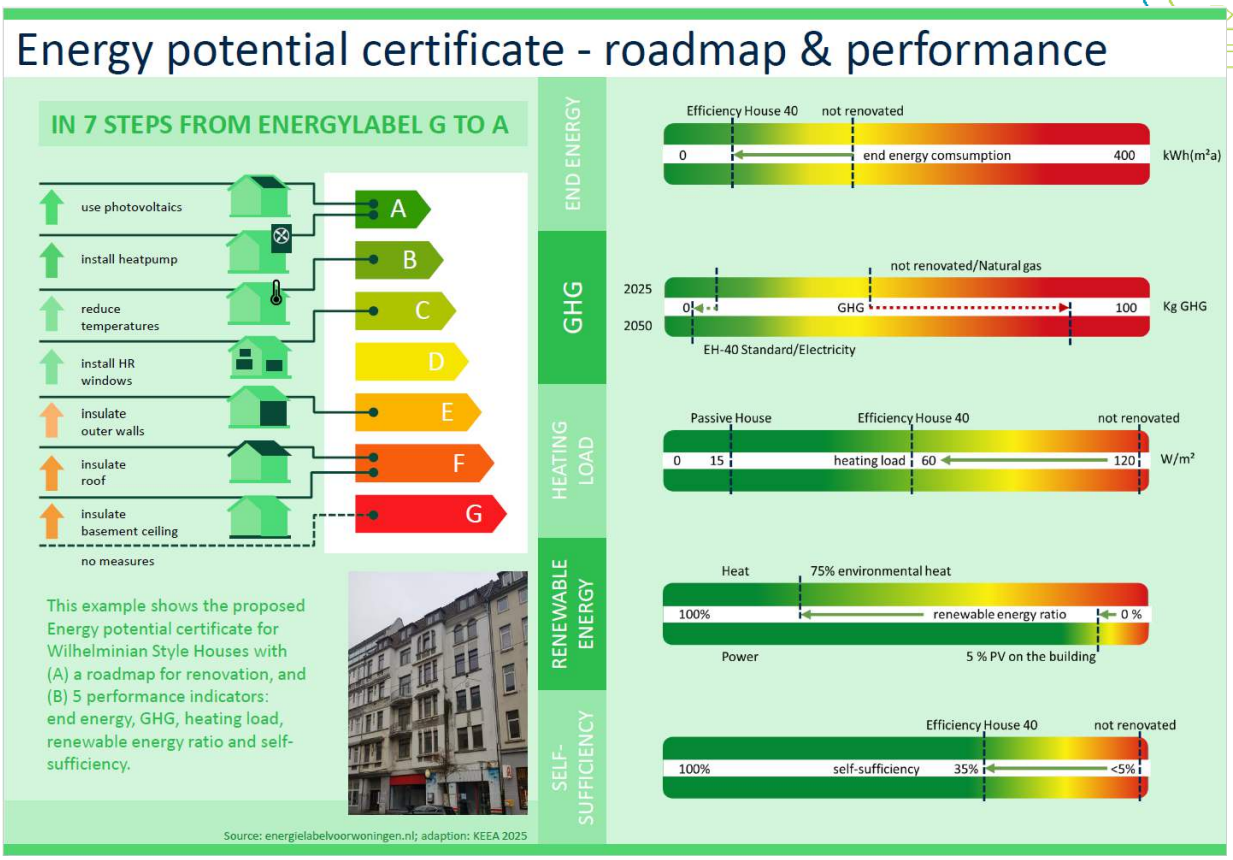
Efficiency classes: renovation in 7 steps

To the left the infographic describes qualitatively the sensible renovation in seven steps, based on the Dutch EPC.

1. insulation of the basement ceiling or the parts of the building that touch the ground.
2. roof insulation as insulation of the top floor ceiling or the roof cladding.
3. insulation of the facade as external insulation or, in the case of a decorative facade that remains visible in terms of building culture, as internal insulation.
4. improvement of windows and doors.
5. reduction of the interior temperature (the interior wall temperatures are lower, comfort can be achieved with lower temperatures).
6. installation of a heat pump to utilize renewable environmental heat.
7. installation of photovoltaics to produce electrical energy for the building.

Performance indicators

The energy potential certificate consists of two illustrations. The left-hand section shows the building renovation based on the EU label of classes A to H. The right-hand section consists of bar charts that correspond to the current energy performance certificate and the target values for complete renovation to energy label “A.” Visual communication is thus based on a familiar visual language.



Energy potential certificate - (A) Roadmap and (B) Performance

Performance indicators on the right-hand side

- *Final energy: The final energy consumption is shown as "not renovated." The potential as target "A." Other energy efficiency standards can also be shown for information purposes, in this case the "Efficiency House 40" standard.*
- *The most important indicator is the emission of greenhouse gases. The upper section of the bar shows the emissions in the year the certificate was created, while the lower section shows the emissions for the year 2050. This distinction is important because the emissions of energy sources may change by 2050. For example, GHG emissions may increase significantly due to the extraction (e.g. fracking) and transportation (liquefaction for tankers) of natural gas. The increasing share of RE in electrical energy will reduce GHG emissions. The renovation to efficiency class "A" is also shown.*
- *The third diagram shows the heating load of the building and its potential reduction. The heating load determines the technical dimensioning of the energy supply infrastructure for supplying the building. The lower the heating load, the smaller and more cost-effective the municipal energy supply can be built and operated.*
- *The fourth diagram shows the proportion of renewable energy produced in the building. This is divided into heat and electricity. In the upper part under heat, waste heat, environmental heat or solar thermal energy is shown. For example, a heat pump with an annual coefficient of performance of four uses around 75 % of the ambient heat. A PV system produces around 10 % of the electricity required.*
- *The fifth diagram shows the existing and potential degree of self-sufficiency in renewable energy. The higher the degree of self-sufficiency, the greater the load on the higher-level energy supply infrastructure. This should be determined using an annual load simulation.*

Presenting bundled packages of measures with potential energy class

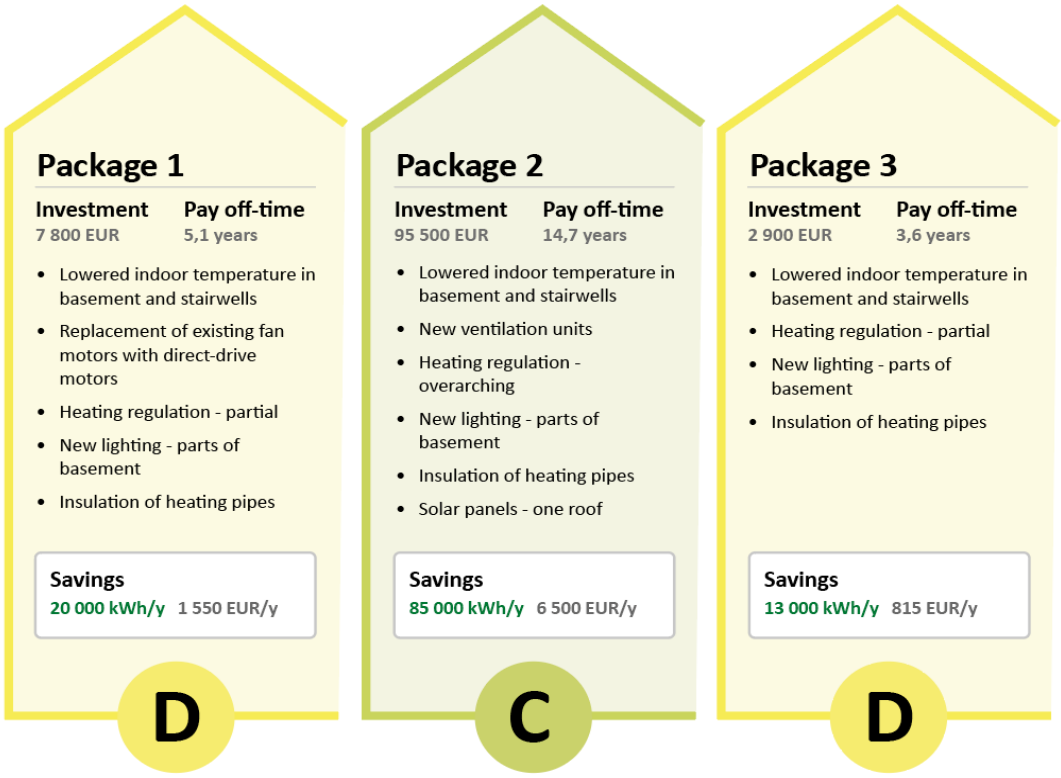
When packages of measures have been identified, it is wise to illustrate the results that HOMAB could achieve depending on which measures are implemented. In the example below, three different packages of measures have been identified and presented in an easy-to-understand format. The summary begins by showing HOMAB's current state. The result of each package of measures is then presented both in table form and through an appealing visual illustration. The potential improvement from the current state that HOMAB would achieve by implementing each package of measures is clearly displayed.

The table and graph show an example of three different bundles of measures for a HOMAB, presenting current energy consumption and energy class compared to potential energy consumption and energy class after implementation.

	Current	Package 1	Package 2	Package 3	
Heating	194 726	184 146	142 442	184 146	kWh
Hot tap water	38 476	38 476	38 476	38 476	kWh
Electricity	23 200	15 300	10 000	22 200	kWh
Total energy consumption, adjusted	254 754	236 364	189 714	243 264	kWh
Primary energy consumption	90	79	62	86	kWh/m^2
Energy class	D	D	C	D	

Energy Efficiency Measures Packages

It should be noted that the actual example is from Sweden where energy class C is equal to new building energy performance standard.



Solution: Developing EPC results into a renovation passport

The new EPBD directive point out renovation passports as an important key component to increase the implementation of energy efficiency measures. Renovation passports should provide information on the number of renovation measures, details of individual measures and the best sequence of measures. They may also provide comprehensive and detailed information on energy and cost savings as well as guidance on funding opportunities.

Energy passports are voluntary for the building owner, but all member states shall have a framework for energy passports in place by May 2026. Mandatory content of an energy passport is:

- Current energy performance of the building
- Graphical presentation
- Explanation of the optimal renovation step sequencing
- Information on each energy measure and renovation step, including possible energy sources
- Share of renewable energy before and after the renovation
- General information on improvement options for various other aspects of a green building, such as CO_2-emissions, circular economy, indoor climate.
- Information on funding
- Contact details for technical advice

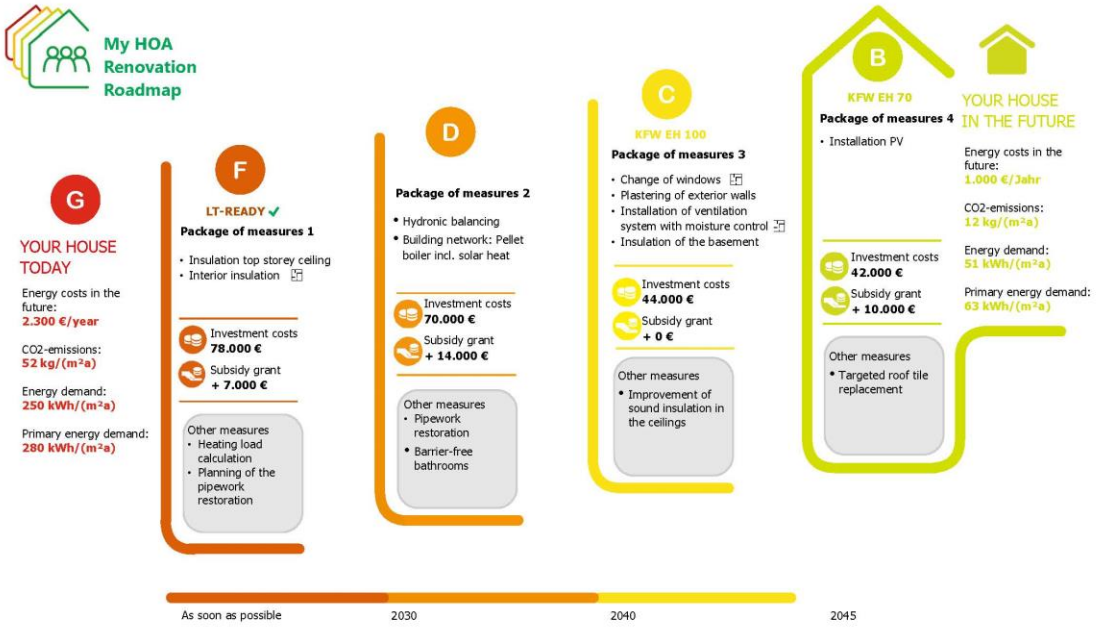
When comparing the mandatory content of energy renovation passports with what already is recommended from the RenoWave project on content for an extended EPC, the conclusion is that most requirements have already been met. In addition, a more detailed plan for the different renovation steps is needed along with information on how to get access to funding and technical assistance.

A step-by-step plan increases the possibility that the measures will actually be implemented. Promotion of renovation passports can therefore be a priority.

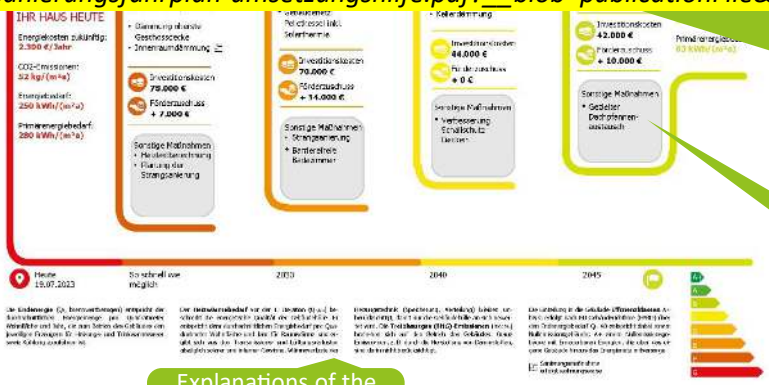
Step-by-step presentations

A step-by-step presentation of proposed energy measures can be done in many different ways. The success factor for reaching out to homeowners is to present each step in a pedagogic easy-understandable-way.

One example how to present a roadmap comes from the German model called Mein Sanierungsfahrplan designed by BMWK and adapted from ifeu Institut for the special needs of HOAs.



Sources: Lawrenz, Julia (2023): Green Home. Erstellung eines konzeptionellen WEG-Sanierungsfahrplans. ifeu - Institut für Energie- und Umweltforschung Heidelberg gGmbH, 2023; Richter, Simon (2022): Optimierung des individuellen Sanierungsfahrplans für Wohngebäude. Masterarbeit an der Hochschule für Technik Stuttgart und ifeu, 2022; BMWK (n.d.): Musterbeispiel: Mein Sanierungsfahrplan. Online available: https://www.bmwk.de/Redaktion/DE/Downloads/S-T/sanierungsfahrplan-muster.pdf?__blob=publicationFile&v=6 ; BMWK (n.d.): Musterbeispiel: Umsetzungshilfe für meine Maßnahmen. Online available:https://www.bmwk.de/Redaktion/DE/Downloads/S-T/sanierungsfahrplan-umsetzungshilfe.pdf?__blob=publicationFile&v=1



e energy
y classes

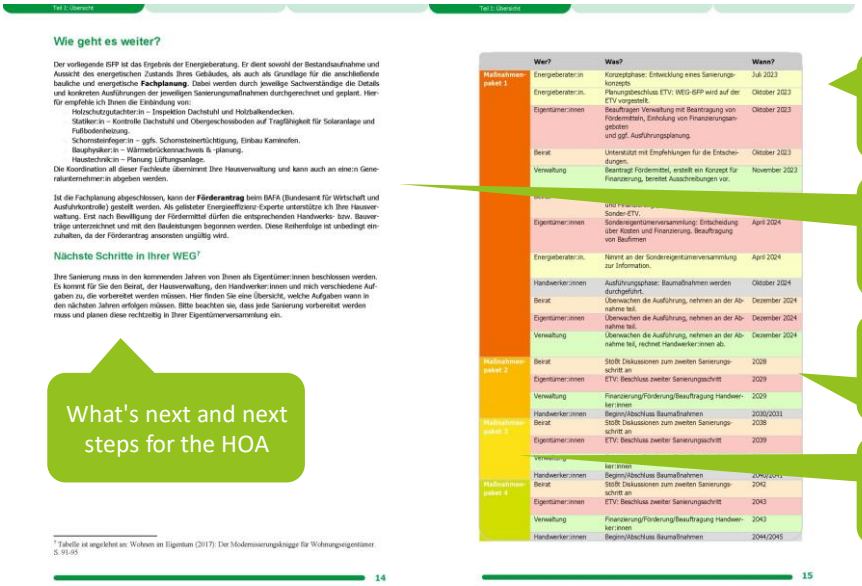
Marking of housing-specific measures with a sign to determine which measures affect the entire building and when the individual flat is affected

Addition of further measures that do not affect efficiency (string renovation, etc.)

Explanations of the timetable directly on the page

Green Home - iSFP for HOA
Julia Lawrenz

What's next + time & measures schedule



Source: iSFP adapted by ifeu (Julia Lawrenz, Simon Richter)

Source: Lawrenz, Julia (2023): Green Home. Erstellung eines konzeptionellen WEG-Sanierungsfahrplans. ifeu - Institut für Energie- und Umweltforschung Heidelberg gGmbH, 2023; Richter, Simon (2022): Optimierung des individuellen Sanierungsfahrplans für Wohngebäude. Masterarbeit an der Hochschule für Technik Stuttgart und ifeu, 2022

Solution: Database with data from EPC

The OSS should have an overview of the building stock in its area and its energy performance. Data collected when issuing Energy Performance Certificates needs to be collected and made available for statistics and benchmarking. An OSS could then extract valuable data for targeting buildings with low energy performance and draw conclusions on energy saving potential. There should be a systematic approach to regularly extract data from the database, to analyze the data and draw conclusions for further proactive work.

The data source to review existing EPCs in Finland is a good example on how a database can be presented: https://www.energiatodistusrekisteri.fi/

(available in Finnish and Swedish)

One-Stop-Shop extended model to increase the multi-apartment building stock renovation in the Baltic Sea Region

Länsstyrelsen Dalarnas län

Energikontor Norr

LAPPEENRANTA

BEF LATVIA