



Straightforward guidance for better buildings

iBRoad2EPC layman's report

sympraxis
TEAM

Sympraxis
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TABLE OF CONTENTS

iBRoad2EPC in 123 words.....	4
The challenges of building renovation	5
From iBRoad to iBRoad2EPC	6
The tool	7
Structure	8
Connectivity and Integration	8
Training and testing	9
Outcomes of the tests	9
Stakeholders' feedback	11
Potential for application and further replication	12
iBRoad2EPC and the new Energy Performance of Buildings Directive (EPBD)	13
Conclusion and outlook	14
An open invitation	14
Further reading	15

IBROAD2EPC IN 123 WORDS

The Horizon 2020 iBRoad2EPC project represents a practical contribution to the decarbonisation of European buildings. The project focused on upgrading the main relevant tool already widely available in the market, namely Energy Performance Certificates (EPCs).

By combining EPCs with certain elements of a building Renovation Passport or roadmap, particularly the renovation guidance, and adding new features, iBRoad2EPC supports demand and implementation of deep renovation of buildings.

iBRoad2EPC's pilot testing in six EU countries has been particularly encouraging.

iBRoad2EPC is a flexible tool suitable for adoption by national markets. The iBRoad2EPC methodology relies on a modular approach, ensuring good integration with developing national EPC schemes. The results are very relevant to the implementation of the new Energy Performance of Buildings Directive (EPBD) recently published.

THE CHALLENGES OF BUILDING RENOVATION

Renovations are undertaken for many reasons, mainly for reducing energy costs, for maintenance and building quality, for rearranging spaces or otherwise adapting a building for other uses, and more. In practice, a well-planned renovation can serve multiple benefits such as energy and cost savings, improvement of thermal comfort, indoor air quality, sound insulation, safety & security, and more.

The EU's targets for decarbonisation of its building stock are particularly ambitious, among other reasons, because European buildings have been constructed over several decades without high energy performance standards. Therefore, substantial investment, coordination and planning, time and high-quality interventions are required, while it is often necessary to maintain at least partial usability of a building during execution of the works.

Building upgrades in Europe are mostly financed –and very often supervised– by the owners themselves, and often implemented in stages. This entails several challenges, including the owners' probable lack of know-how, which can impact the quality, as well as the cost of the renovation. A common issue is 'lock-in', whereby choices during the first stages of a stepwise renovation limit the potential –or disproportionately raise the cost– of future improvements. In this context, authoritative guidance is of essence. In practice, buildings differ significantly both as broader typologies and as individual constructions, while owners themselves have different needs and resources. Thus, customised guidance needs to be provided by experts.



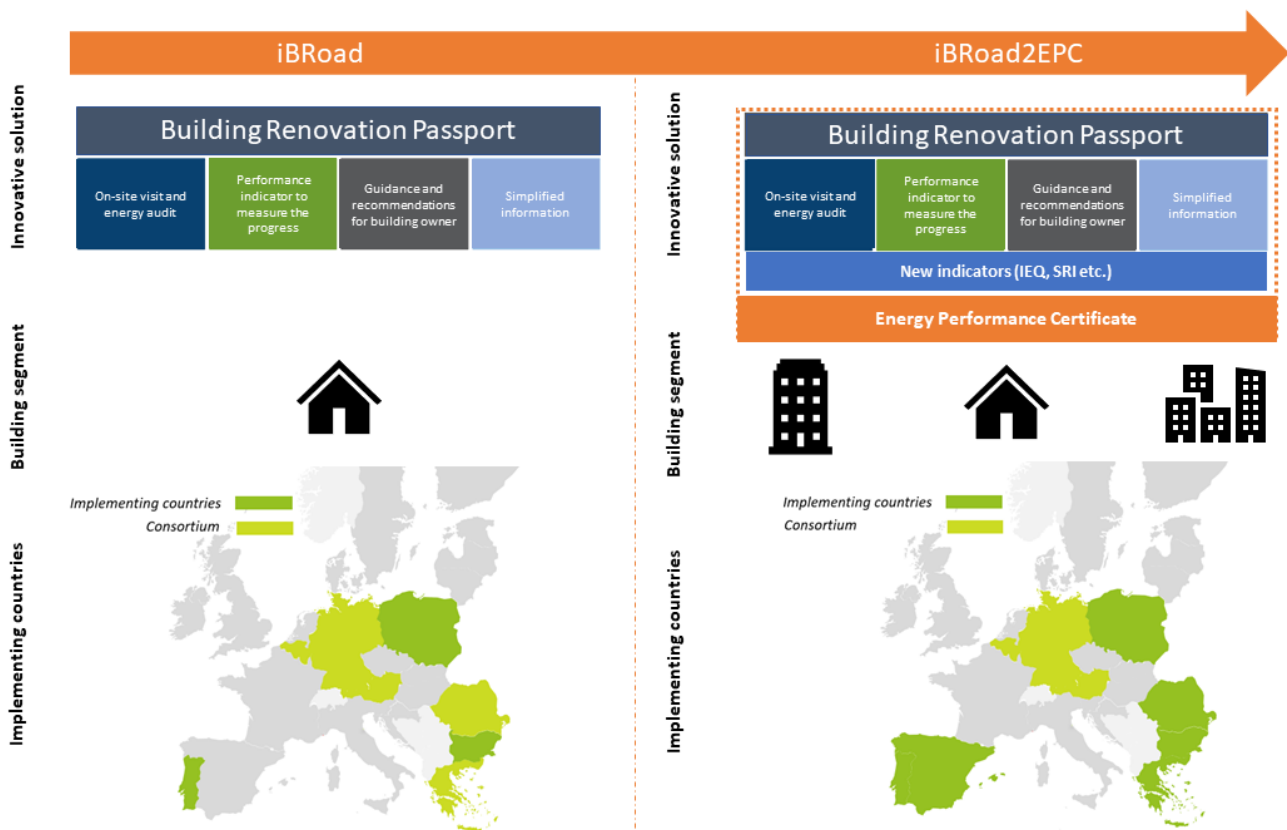
FROM IBROAD TO IBROAD2EPC

Bespoke guidance by experts was the approach taken by iBRoad¹, iBRoad2EPC's predecessor project, which focused on developing a model Renovation Passport for buildings – a step-by-step renovation roadmap customised for individual residential buildings and according to their owners' means and requirements. The Renovation Passport was complemented by a Digital Building Logbook (DBL), a repository of building information.

The iBRoad2EPC project followed on iBRoad's footsteps, while taking a more user friendly, market-oriented and pragmatic approach, simplifying and cutting down the expected cost of the renovation plan, integrating it with the Energy Performance Certificate (EPC), adding new features and facilitating implementation at scale.

iBRoad2EPC integrates all planned changes under a single building Renovation Passport, ensuring the most efficient combination of interventions, and leveraging the multiple benefits that a well-planned renovation can provide.

iBRoad2EPC can become a powerful tool suitable for adoption by national markets, triggering demand for energy efficiency in existing buildings and used to support decision-making in real estate transactions. The iBRoad2EPC methodology includes a modular approach to ensure good integration with national EPC schemes.



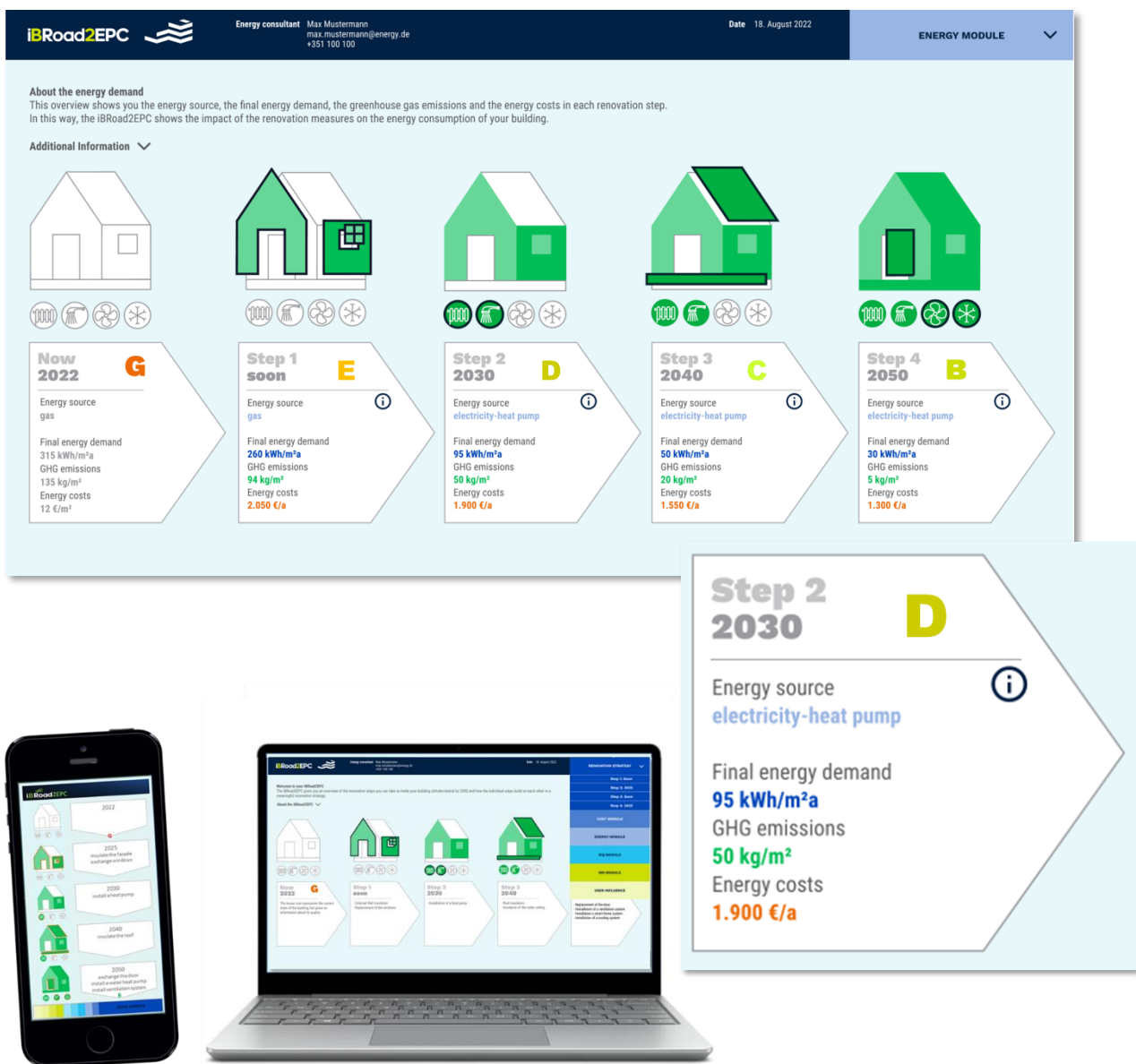
Overview of evolution from the iBRoad project to iBRoad2EPC

¹ For a brief overview on iBRoad, please see that project's Layman's Report, available at <https://ibroad-project.eu/results/reports/>

THE TOOL

The ambition of the iBRoad2EPC project has been to develop a capable tool that is sufficiently flexible and affordable to trigger a major increase in the number of deep –reaching zero or nearly zero net emissions– building renovations, across varying country contexts. In this sense, it was conceived as a complement to existing national Energy Performance Certificate (EPC) schemes, to be jointly issued by a qualified or certified energy expert, following an on-site visit.

The developed iBRoad2EPC is a flexible model Renovation Passport that brings together the benefits of the EPC, as an established tool to assess the energy performance of a building, with those of a tailored roadmap for its deep renovation in a maximum number of steps, significantly improving the building's energy performance. Adding new components to this combined approach iBRoad2EPC aims to give renovation a significant push and contribute to the improvement of the energy performance of European buildings, while providing for health, comfort, cost-effectiveness and energy security.



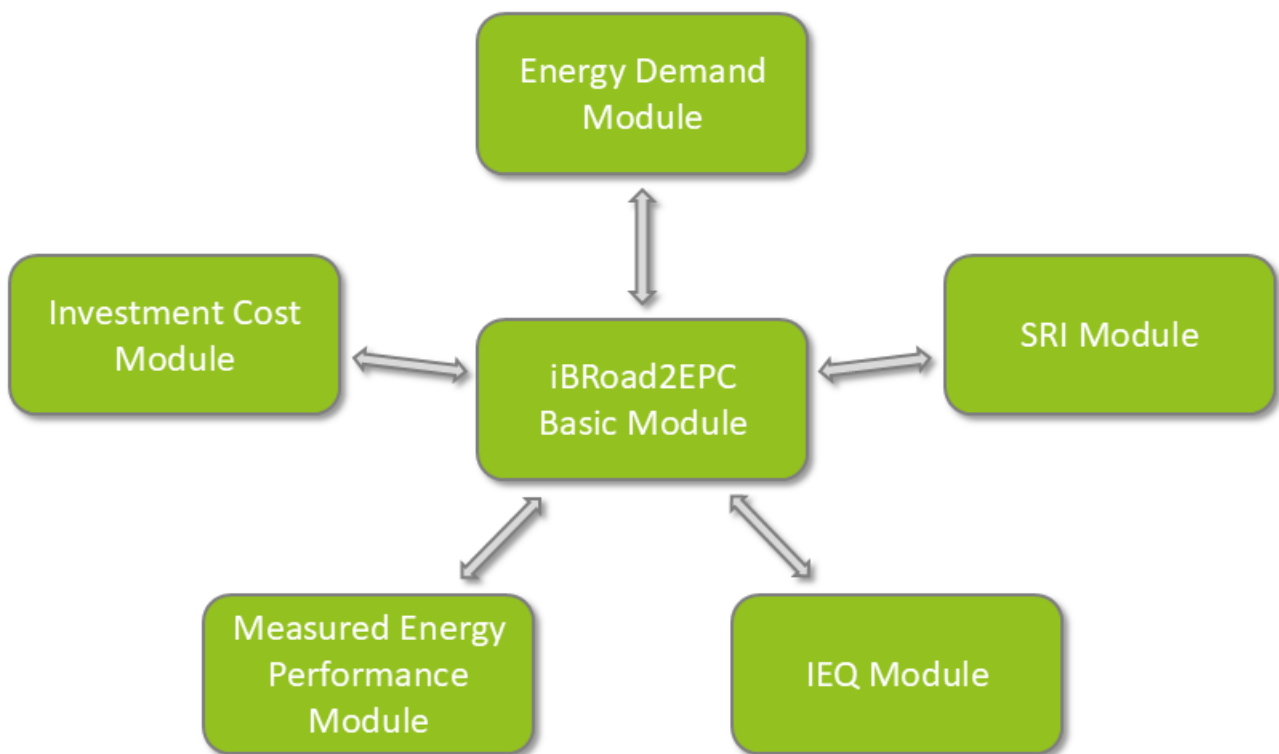
iBRoad2EPC sample renovation path, detail of single step, appearance on various devices.

Structure

The iBRoad2EPC approach consists of a back-end software, the iBRoad2EPC Assistant, through which energy experts, following an on-site visit, can issue the simplified individual building renovation plan, to become part of the EPC. At the heart of iBRoad2EPC is an extensive database of renovation approaches, measures and associated advice, that building energy professionals can utilise to facilitate and streamline their work.

To be able to do this, the main functionality in the iBRoad2EPC Assistant, the so-called Basic Module, includes advanced country- and building-type-specific advice for stepwise renovation. Target dates and states are in alignment with future energy and climate targets, and corresponding notes are included to avoid lock-in effects.

Additional modules can be connected to the application. Currently, implemented modules include the Investment Cost module, Energy Demand module, Indoor Environmental Quality module, Smart Readiness Indicator module, and Measured Energy Performance Indicator module.



iBRoad2EPC modular structure

The iBRoad2EPC Assistant currently supports single-family, multi-family and various types of public buildings. This means that certain aspects of the user interface change depending on the building type. Moreover, location and other characteristics define the specific renovation measures (and related information) chosen.

Connectivity and Integration

iBRoad2EPC has been conceptualised from the start as an open modular tool, adaptable and expandable. In addition, iBRoad2EPC can itself be integrated in the greater value chain of energy performance assessment and certification, building management, as well as policy planning and implementation.

iBRoad2EPC allows the import of EPC data from XML or Excel files and provides an Application Programming Interface (API) to allow data exchange with third party software, such as EPC software, EPC databases, Digital Building Logbooks, Cadastres, Building Registries and more.

TRAINING AND TESTING

A field test in six countries –Bulgaria, Greece, Poland, Portugal, Romania and Spain– piloted iBRoad2EPC implementation and examined how it is perceived by relevant end-users (energy experts and building owners / building managers).

Prior to field testing, a total of 202 energy experts in the six pilot countries were trained on how to issue the iBRoad2EPC. The overall evaluation following the training showed predominantly positive feedback:

- 86% of trained experts saw potential in merging iBRoad2EPC and EPCs
- 91% said they would offer an iBRoad2EPC to their clients

Of the energy experts trained, in total 48 participated in the field test and issued 57 iBRoad2EPCs, covering a built area of almost 280,000 m², of both residential and non-residential buildings, with particular focus on public buildings.


Outcomes of the tests

The experience of the experts and the building owners / building managers who took part in the testing was collected through a survey. The key findings of the evaluation are the following:

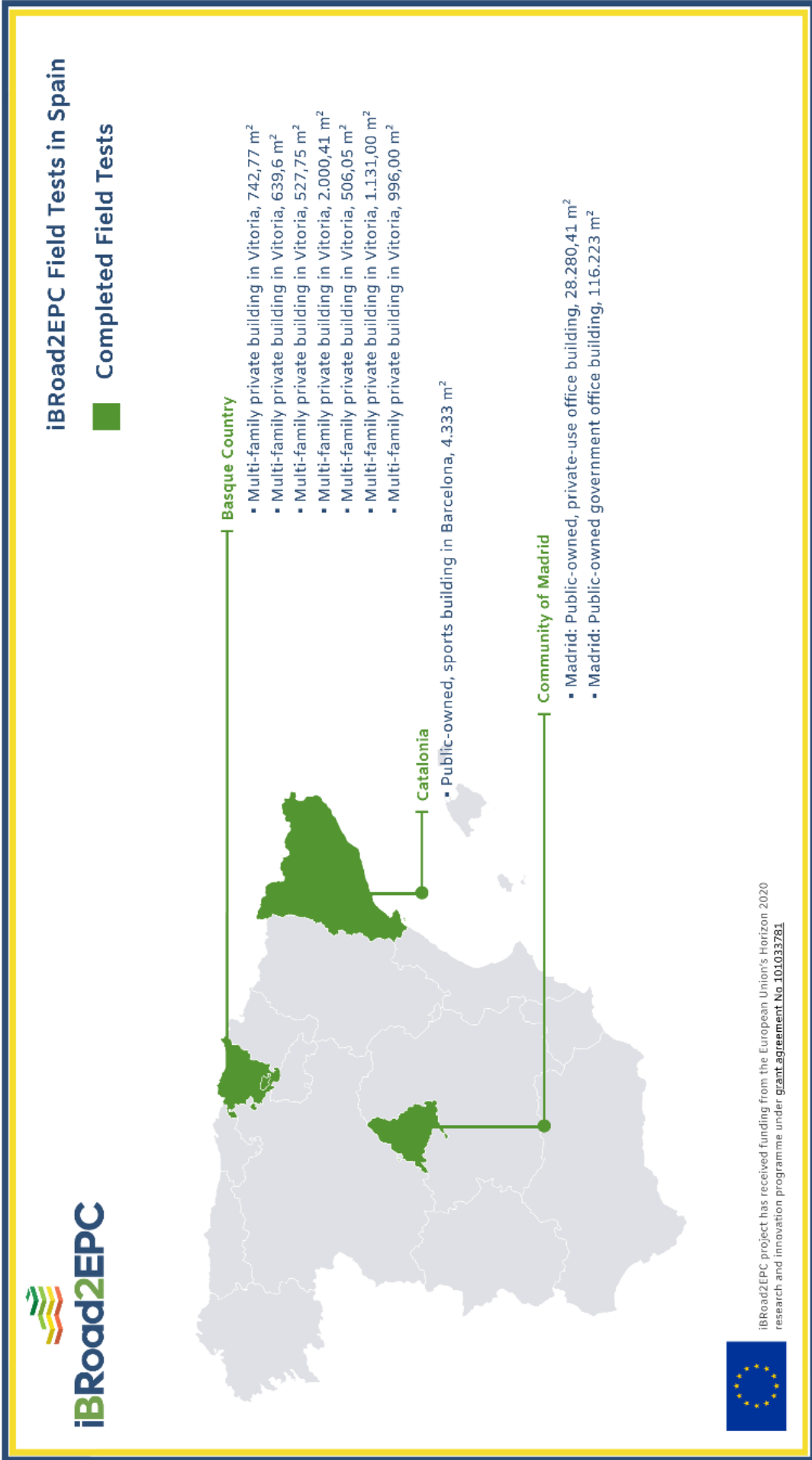
- 85% of the experts and 70% of the owners said that iBRoad2EPC provides the building user/owner with very or extremely useful information.
- 87% of the experts and 78% of the owners said that iBRoad2EPC provides the building user / owner with an outline of a long-term renovation plan for their building.
- 98% of the experts and 83% of the owners found the detailed description of single renovation steps in iBRoad2EPC very or extremely useful.
- The highest rated feature of iBRoad2EPC was the description of preparatory measures for later renovation steps (notes to avoid lock-ins), with 37 % of the experts rating these extremely useful, and another 46% very useful.
- At least half of the building owners felt motivated to conduct concrete renovation measures through the iBRoad2EPC, while 63% of the experts believe the tool will motivate owners to renovate.
- 91% of the experts would recommend the tool to their clients and 93% to their colleagues.
- 80% of the building owners would recommend the tool to other building owners.

Both experts and owners favoured the voluntary integration of iBRoad2EPC alongside the EPC, reflecting the tool's potential to enhance energy efficiency and cost-effectiveness in building renovations.

In terms of pricing, 35% of the experts and 31% of the building owners consider a surcharge of more than 100% on top of the price of the EPC to be reasonable. This is indicative of the perceived value and potential of iBRoad2EPC to contribute to energy-efficient renovations and climate change mitigation.

	<p>Floor area</p> <p>1,560 m²</p>	<p>Building year</p> <p>1987</p>	<p>Last renovation</p> <p>Not renovated</p>	<p>Characteristic</p> <p>Energy class C; no insulation; aims to reach Class A in the first renovation step (asap)</p>
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*Above: Indicative building tested in Bulgaria.
Next page, landscape orientation: iBRoad2EPC field tests in Spain*



STAKEHOLDERS' FEEDBACK

Evaluation of iBRoad2EPC included consultation roundtables in the six pilot countries in which it was tested. Along with those taking part in the testing, a combined total of more than 250 participants / stakeholders provided insights across the six countries. Overall, iBRoad2EPC was considered a robust example of a comprehensive Renovation Passport which offers many advantages:

- a flexible / modular architecture that can be easily adapted to fit different country needs;
- a user-friendly issuing platform (the iBRoad2EPC online Assistant) with pre-filled text blocks that can easily be edited by energy experts, making the issuing procedure very easy and time-efficient;
- aesthetically pleasant output documents with easy-to-understand graphics and responsive, dynamic design;
- potential for interconnection with different platforms, databases and other software tools.



iBRoad2EPC stakeholders' roundtable in Greece

POTENTIAL FOR APPLICATION AND FURTHER REPLICATION

The iBRoad2EPC concept has been adapted, translated and tested in six specific countries (Bulgaria, Greece, Poland, Portugal, Romania and Spain). For those countries, comprehensive guides supporting national implementation have been developed and made available.

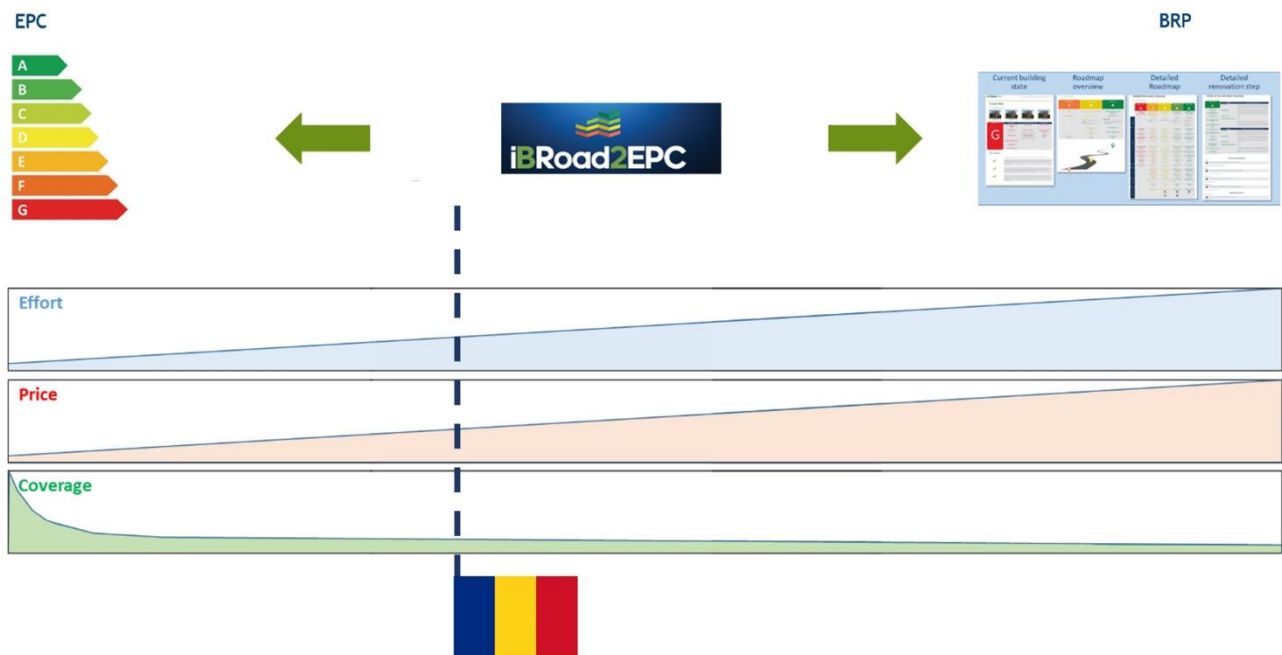
iBRoad2EPC can be further customised for any country implementing the Energy Performance of Buildings Directive, within or outside the EU. A country wishing to implement iBRoad2EPC can adapt to its national requirements the full country database including climate zones, energy classes, colour codes, building types, national target states and related milestones, national energy performance standards, legal obligations or bans, as well as renovation measures and notes to avoid lock-in, etc.

A country can choose which of the available modules it wishes to enable and may also allow new modules to connect to the application.

Finally, all information can be translated to the national language, if not already available.

The iBRoad2EPC consortium encourages the replication of the tool and considers that there is a strategic market placement for iBRoad2EPC, within the national Energy Performance Certification framework.

In alignment with the new EPBD requirements, countries choosing to integrate iBRoad2EPC would substitute the EPC recommendations by those provided through iBRoad2EPC. They also need to ensure that the outcome is uploaded to the national database for the energy performance of buildings and accessed via Digital Building Logbooks. iBRoad2EPC already includes the functionality to do all of this.



The Romanian iBRoad2EPC is conceptually placed towards the EPC end of the EPC-Renovation Passport spectrum

IBROAD2EPC AND THE NEW ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (EPBD)

The recast Energy Performance of Buildings Directive (EPBD) of the European Parliament of 24 April 2024 is significantly ambitious. Among other provisions, it highlights the importance for the upcoming National Building Renovation Plans (currently national Long Term Renovation Strategies) to address remaining barriers in the process and strategy of decarbonising the national building stock. For example, fossil fuel phase-out and heat & cooling decarbonisation may be implemented in more than one steps.

Similarly, aiming to reach net zero emissions for existing buildings would in most cases require several interventions to be gradually implemented. This can also enable building owners to take advantage of the best options available, at affordable market prices.

iBRoad2EPC integrates all these provisions foreseen by the regulatory framework. They are recorded in iBRoad2EPC's database of stepwise renovation advice and fully support the enhanced performance targets. The wider the uptake of iBRoad2EPCs, the more buildings will be gradually renovated toward the required targets.

iBRoad2EPC provides proof of concept of the Renovation Passport as foreseen in Article 12 of the new EPBD and in accordance with the common framework set out in its Annex.

The recast EPBD also expands the scope beyond energy efficiency during building operation, e.g., by including provisions for reducing Whole Life Carbon. iBRoad2EPC is an open modular tool which can integrate additional modules along the way, covering such new aspects.

Last but not least, financing and One-Stop Shops are two of the areas addressed by the new EPBD where iBRoad2EPC can play an important role. It allows planning building interventions to take advantage of any suitable funding and financing options available. iBRoad2EPC can complement One-Stop Shops by providing a single reference for the interventions they support.



CONCLUSION AND OUTLOOK







The iBRoad2EPC project has successfully developed a flexible and practical Renovation Passport model, which has been well received in the pilot countries. Designed as a modular tool, the iBRoad2EPC Renovation Passport allows adaptation to various existing Energy Performance Certification schemes or country-specific ambitions and contexts. Such flexibility is now reflected in the provisions of the 2024 recast Energy Performance of Buildings Directive (EPBD) that allow Member States to determine the extent to which Renovation Passports and EPCs should be linked. As such, the results of the iBRoad2EPC project are highly relevant and provide Member States with a set of solutions that can be immediately applied to the transposition and/or implementation of this, as well as other, important EU policy instruments.

Member States can use and adapt this Renovation Passport model in terms of system integration, affordability, and automation. By addressing these areas and further adapting to national contexts, iBRoad2EPC has the potential to become a key tool in the EU's strategy to decarbonise its building stock, supporting both mandatory and voluntary renovation measures under the recast Energy Performance of Buildings Directive (EPBD). For the future, the project recommends further integration with existing frameworks, exploring new financing models, and extending the scope of iBRoad2EPC with additional modules to meet future regulatory needs and technological advances.

An open invitation

Authorities interested in integrating iBRoad2EPC in their national energy performance certification schemes are encouraged to contact the consortium through the project website www.ibroad2epc.eu or email contact@ibroad2epc.eu

FURTHER READING

 <p>Conceptualising iBRoad2EPC How Energy Performance Certificates (EPCs) can be upgraded with Building Renovation Passport (BRP) elements</p>	<p>The iBRoad2EPC overall concept is described in the report <i>“Conceptualising iBRoad2EPC – How Energy Performance Certificates (EPCs) can be upgraded with Building Renovation Passport (BRP) elements”</i>.</p>
 <p>Training toolkit iBRoad2EPC</p>	<p>Material on how to use iBRoad2EPC is available as part of the <i>“iBRoad2EPC training toolkit”</i>.</p>
 <p>Evaluation of iBRoad2EPC training</p>	<p>For the full iBRoad2EPC training evaluation please see the report <i>“Evaluation of iBRoad2EPC training”</i>.</p>
 <p>Accelerating deep renovation in the EU with Renovation Passports An implementation plan in the context of national strategies of deep renovation</p>	<p>Guidance for policy makers on maximising the use of iBRoad2EPC and best prepare the ground for the transposition of the recast EPBD, in terms of the design and uptake of Renovation Passports to accelerate deep renovation, can be found available in the report <i>“Accelerating deep renovation in the EU with Renovation Passports – EU roadmap proposing concrete measures to maximise the uptake of iBRoad2EPC schemes”</i>. This also includes a detailed analysis which shows the iBRoad2EPC solution for each relevant article of the new EPBD.</p>
 <p>Enhancing incentives through iBRoad2EPC How to best use financial and non-financial incentives for renovation in implementing markets</p>	<p>The iBRoad2EPC report <i>“Enhancing incentives through iBRoad2EPC – How to best use financial and non-financial incentives for renovation in implementing markets”</i> lists various examples of incentives linked with EPCs or improvements in energy performance and offers ways to best use iBRoad2EPC in incentive schemes for renovation.</p>
 <p>iBRoad2EPC perspectives #2 Public authorities views on the integration potential</p>	<p>National guides for the roll-out of iBRoad2EPC in the six implementing countries are included in the report <i>“iBRoad2EPC: Public authorities views on the integration potential”</i>.</p>



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