



iBRoad2EPC perspectives #1

Stakeholders views on iBRoad2EPC adoption

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Published in August 2024 by iBRoad2EPC.

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EXECUTIVE SUMMARY

This document details the results of the evaluation process of iBRoad2EPC in the form of consultation roundtables in the six pilot countries in which it was tested (Bulgaria, Greece, Poland, Portugal, Romania and Spain). The main focus of these roundtables was to present the testing results to all national stakeholders, including the National Advisory Committee (NAC) members, share experiences, evaluate the methodology, and discuss the adoption potential of iBRoad2EPC. These consultation roundtables concluded the process of the iBRoad2EPC roll-out in the six pilot countries during the project's duration, which aimed to bring the iBRoad2EPC method and tools as close as possible to its actual integration to the national EPC schemes for single-family, multi-family and public buildings by addressing local legal, social, financial and other parameters.

A brief introduction to the iBRoad2EPC concept and tools is followed by a specific section for each pilot country where the minutes/ proceedings of the roundtable discussions are presented along with the key insights deriving from the discussions. The results of the evaluation procedure set the basis for potential future improvements of iBRoad2EPC.

The six pilot countries differ in terms of established EPC frameworks, awareness regarding Renovation Passports and stakeholders' willingness to adopt a tool such as iBRoad2EPC. It was, however, agreed that iBRoad2EPC is 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 be easily 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 due to the three approaches developed for integration (API, XML and EXCEL options).

The roundtable discussions in the six pilot countries highlighted the potential of iBRoad2EPC to fulfil the obligations that arise from the 2024 recast of the EPBD, specifically the provisions of Article 12 regarding Renovation Passports [1].

Suggestions for future improvements included more generalised interconnection with other tools related to the EPC and other databases/software tools in the countries, scalability of projects beyond the individual building case, and coupling with financing mechanisms to mitigate the additional cost for building owners.

The key takeaways from the consultation procedure with the combined total of more than 250 participants/stakeholders who provided insights across the 6 pilot countries are the following:

- In countries with a more advanced EPC framework, such as Portugal, new perspectives and links with existing successful tools and platforms are needed to ensure iBRoad2EPC is future-proof.
- The simplified approach and pre-filled text descriptions of iBRoad2EPC play a very important role in Bulgaria, where the complex methodology for building certification requires a high degree of effort from energy experts and translates to high costs for building owners.
- There is willingness of authorities to collaborate with iBRoad2EPC for the improvement of energy efficiency schemes (Bulgaria, Greece, Poland), the integration with existing or planned databases and tools (Greece, Portugal, Romania) and the national transposition of the revised EPBD (Portugal, Romania, Spain).
- Future actions should focus on the alignment of iBRoad2EPC with EPBD transposition requirements in each country, finalisation of the automation and interconnections with third-party software, platforms and databases, as well as necessary legal, financial and regulative amendments to ensure adaptation in the country related procedures and schemes, as described in the priorities and actions identified in the national action plans included in the report "Public authorities views on the integration potential".

TABLE OF CONTENTS

INTRODUCTION	7
OBJECTIVES OF THIS REPORT	8
METHODOLOGY	9
OVERVIEW OF STAKEHOLDER DISCUSSIONS PER COUNTRY	10
Bulgaria	10
Agenda of the event	10
Presentations and discussion topics	11
Key takeaways - stakeholders views	12
Greece	14
Agenda of the event	14
Presentations and discussion topics	15
Key takeaways - stakeholders views	15
Poland	17
Agenda of the event	18
Presentations and discussion topics	18
Key takeaways - stakeholders views	19
Portugal	20
Agenda of the event	20
Presentations and discussion topics	21
Key takeaways - stakeholders views	24
Romania	26
Agenda of the event	26
Presentations and discussion topics	27
Key takeaways - stakeholders views	28
Spain	30
Agenda of the event	30
Presentations and discussion topics	31
Key takeaways - stakeholders views	32
CONCLUSIONS AND RECOMMENDATIONS	33
REFERENCES	34

LIST OF FIGURES

Figure 1: Photo of the iBRoad2EPC stakeholders’ Roundtable in Greece..... 14

Figure 2: Photo of the iBRoad2EPC stakeholders’ Roundtable in Poland 17

Figure 3: Screenshots from the iBRoad2EPC stakeholders’ Roundtable in Portugal 21

Figure 4: Overview of the participants of the Romanian roundtable discussion 27

Figure 5: Screenshot from the iBRoad2EPC stakeholders’ Roundtable in Spain. 30

LIST OF TABLES

Table 1: Agenda of the iBRoad2EPC roundtable in Bulgaria 10

Table 2: Agenda of the iBRoad2EPC Roundtable in Greece 15

Table 3: Agenda of the iBRoad2EPC Roundtable in Poland. 18

Table 4: Agenda of the iBRoad2EPC roundtable in Portugal 20

Table 5: Agenda of the iBRoad2EPC Roundtable in Romania 26

Table 6: Agenda of the iBRoad2EPC Roundtable in Spain 30

Table 7: Key conversation points raised during the Spanish Roundtable 32

ABBREVIATIONS

EU	European Union
EPC	Energy Performance Certificate
EBPD	Energy Performance of Buildings Directive
NBRP	National Building Renovation Plan
RP	Renovation Passport
IEQ	Indoor Environment Quality
SRI	Smart Readiness Indicator
MEPI	Measured Energy Performance Indicator
SEDA	Sustainable Energy Development Agency
NRRP	National Recovery and Resilience Plan
NAC	National Advisory Committee
RCCTE	Regulation of Thermal Behaviour Characteristics in Buildings
CSCAE	Consejo Superior de Colegios de Arquitectos de España (Architects Association of Spain)
CGATE	Spanish National Council of Technical Architects
API	Application Programming Interface
XML	Extensible Markup Language file
EED	Energy Efficiency Directive
RED	Renewable Energy Directive
EERSF	Energy Efficiency and Renewable Sources Fund (Bulgaria)
MRiT	Ministry of Economic Development and Technology (poland)
ECF	European Climate Fund
BIM	Building Information Modelling
DECO	Consumers Association (Portugal)
SCML	Santa Casa Misericórdia de Lisboa (Portugal)
GEBALIS	Gestão do Arrendamento da Habitação Municipal de Lisboa
LED	Light Emitting Diode
AICCOPN	Portuguese Construction Companies' Association

INTRODUCTION

iBRoad2EPC is an energy consultation tool which builds on the Energy Performance Certificate (EPC) and integrates building Renovation Passport elements and new parameters into existing EPC schemes to improve the EPC recommendations and guide renovation, either in one or in several steps. It offers several advantages both for building owners/managers and energy experts, such as preventing lock-in effects, incorporating national climate and decarbonisation targets and priorities in the proposed renovation steps, promoting synergies with existing tools and databases, etc. It is designed as a modular tool which offers in its core/Basic module staged deep renovation advice, along with optional additional add-on modules such as the Investment Cost module, Energy Demand module, Indoor Environmental Quality module (IEQ), Smart Readiness Indicator module (SRI) and Measured Energy Performance Indicator module (MEPI).

Moreover, its flexible and modular nature allows for extensive adaptations to fit the specific needs and market maturity of different countries, as showcased in the six pilot countries in which it was tested (Bulgaria, Greece, Poland, Portugal, Romania and Spain). The adaptations implemented concern not only the number or type of modules selected for each country as being more suitable, but also the adaptation to the national context of the databases (renovation advice, etc.) and software (technical adaptation), the language, as well as the technical integration with the national EPC tools (API, XML or EXCEL approach).

The developed iBRoad2EPC concept and methodology is described in detail in the report titled “iBRoad2EPC in depth” [2], whereas the context, target groups and methodology for country specific adaptation is described in the report titled “Specification for the iBRoad2EPC software tools” [3], both available at the project’s website¹. The iBRoad2EPC field test took place after training a number of energy experts in the six pilot countries. The results show that the iBRoad2EPC, together with the EPC, has significant potential to support the implementation of the 2024 EPBD recast and help meet the EU’s building decarbonisation targets. The report “iBRoad2EPC field test results” [4] summarises the results of the iBRoad2EPC testing procedure based on the analysis of the evaluation surveys from energy experts and building owners that took part in the field test.

As foreseen by the recast EPBD, Renovation Passports are expected to provide a clear roadmap for staged renovation over the lifetime of a building, helping owners and investors plan the best timing and scope for interventions. This is the case for iBRoad2EPC, as presented in the project report “Accelerating deep renovation in the EU with renovation passports” [5] which analytically demonstrates the ways in which iBRoad2EPC can support and facilitate the implementation of the EPBD also beyond Article 12 and its requirements for the Renovation Passports as set in Annex VIII, as well as the Renovation Wave strategy, the Energy Efficiency Directive (EED) and the Renewable Energy Directive (RED).

¹ <https://ibroad2epc.eu/>

OBJECTIVES OF THIS REPORT

The design and national adaptation of the tool was supported by National Advisory Committees (NACs) in the six pilot countries consisting of various key actors/stakeholders involved in the national frameworks regarding EPCs and Renovation Passports. NAC meetings were pivotal for the success of the national roll-outs, the design of the initial [6] and updated² national guides for iBRoad2EPC implementation and to ensure that the tool offers real added value for all concerned parties.

National stakeholders outside of the NACs were also asked to provide their feedback to the iBRoad2EPC methodology during roundtable discussions that were organised by pilot country national partners at the end of the field-testing procedure. In some cases, national partners organised also a final NAC meeting after the roundtable discussions, to discuss some aspects more in detail before concluding with the assessment. The minutes/proceedings of these roundtable and final NAC discussions are presented in this report. The purpose of these discussions was to reassess iBRoad2EPC's integration potential into the national frameworks of the six pilot countries based on recent feedback and testing results.

The discussions held during the above-mentioned roundtables also drive the update of the iBRoad2EPC national guides which are included in the report "*iBRoad2EPC perspectives #2: Public authorities' views on the integration potential*". Finally, the lessons learnt from the national roll-outs and the evaluation procedure also feeds the report "*Revamping the iBRoad2EPC concept: lessons learnt from implementation*" in which the overall concept will be reviewed and improved for dissemination beyond the project's six implementing countries.

The objectives of this report are:

- to present an overview of the structure, points discussed and key takeaways of the roundtable discussions during the evaluation of iBRoad2EPC and
- to conclude on the main findings regarding iBRoad2EPC future adoption potential, as seen through the eyes of different stakeholders in the six pilot countries.

The report is structured in country specific chapters, where the roundtable discussions are described in detail starting with the date, nature (physical or hybrid/online) and participants of the Roundtable, and then proceeding with the detailed description of the topics discussed, the feedback from stakeholder groups and NAC members and, finally, the key takeaways from the discussions with regards to the iBRoad2EPC implementation potential and overall assessment in each country. In the end, a conclusions section summarises the key findings in each pilot country and provides a holistic overview of the assessment results.

² Project report titled "*iBRoad2EPC perspectives #2: Public authorities' views on the integration potential*"

METHODOLOGY

The stakeholders' views during the roundtable discussions were gathered by pilot country partners and provided in the form of detailed minutes which are presented in the current report. Key insights regarding barriers and facilitators concerning iBRoad2EPC adoption in each pilot country are derived from the discussions and are presented in the respective country sections. The format of roundtable discussions was similar to the NAC meetings, with an extended list of participants identified by pilot country partners as relevant to iBRoad2EPC and considered useful to provide feedback on the concept, tools, methodology and overall adoption potential from their point of view. The meetings in some countries took place as a standalone event, whereas in other countries was a closed session as part of a larger event organisation.

The agenda of the dedicated sessions included a presentation from the national partners of the iBRoad2EPC concept and tool, the activities of the project and the learnings of the field-testing procedure. Then, interested parties provided their comments and feedback, as part of a general discussion moderated by the partners. The participant groups as well as the moderation of the sessions were left free for country partners to decide on the structure, duration and contents, in order to address country-related peculiarities in the best way possible.

In some countries, a separate final NAC meeting took place, combined with the roundtable discussions as a session held before or after the stakeholders' assessment. In other cases, there was no separate NAC discussion since NAC members were already invited to participate in the Roundtable. When a separate session was organised, the proceedings of the discussions that concern the assessment of iBRoad2EPC's implementation potential are also included in the pilot country chapter.

OVERVIEW OF STAKEHOLDER DISCUSSIONS PER COUNTRY

Bulgaria

The roundtable discussions to engage different iBRoad2EPC stakeholders in Bulgaria took place on 24 April 2024, on the second day of the final conference of the H2020 project BeSMART³ dedicated to financing of sustainable energy projects which gathered a total of 93 stakeholders from various participant groups. The hosting conference, as well as the Bulgarian Roundtable, was held as a hybrid event (both physical at the Alfaresort Palace Chiflika Hotel and via Zoom platform). On the same day, after the end of the conference proceedings, five (5) members of the Bulgarian NAC gathered for the closing NAC meeting of the iBRoad2EPC project, to discuss more in depth on the findings and main takeaways from the field test in Bulgaria.

Agenda of the event

The agenda of the conference which also hosted the iBRoad2EPC Roundtable is available online⁴. The session dedicated to the iBRoad2EPC assessment was under the focus topic “Certification of Buildings and Construction Professionals” and was held between 12:15-13:00 local time (45 minutes duration). The session was moderated by Stanislav Andreev from EnEffect and included one presentation followed by a panel discussion.

The iBRoad2EPC project aims to link the Building Renovation Passport with the Energy Performance Certificate (EPC), expanding and enhancing its format to improve reliability, utility, and efficiency, thereby creating the next generation of EPCs. Therefore, the main goal of the session was to discuss how the outcomes and lessons learned during iBRoad2EPC project can support future legislative changes related to EPC, specifically in terms of content, quality, and methodology. In addition, special attention was paid on the certification of construction professionals, focusing on knowledge, skills, and qualification requirements, based on the findings during the trainings organised within the project.

The session specific agenda is shown in Table 1.

Description	Presenter	Time
FOCUS TOPIC II: CERTIFICATION OF BUILDINGS AND CONSTRUCTION PROFESSIONALS	Moderator: Stanislav Andreev, EnEffect	12:15-13:00
Quality Assurance, Professional Capacity Building and Market Orientation: The role of Building and Professional Certification Systems	Dragomir Tzanev, Eneffect	12:15-12:30
Panel Discussion: Opportunities for Improvements in the Certification System	Participants: Zdravko Genchev, EnEffect Fantina Rangelova, UACEG Ivaylo Aleksiev, Executive Director, SEDA Martina Krasteva, Bulgarian Construction Chamber Kostadin Hristov, Chamber of Architects in Bulgaria	12:30-13:00

Table 1: Agenda of the iBRoad2EPC roundtable in Bulgaria

³ <https://www.besmartproject.net/>

⁴ https://www.besmartproject.net/uploads/1/3/8/4/138414569/2024-04-23_ecoenergy_besmart_conference_agenda_%D0%95n1.pdf

Presentations and discussion topics

Roundtable discussion

The opening plenary session of the 2nd day of the event focused on the financing instruments for building renovation. The next thematic panel focused on energy management, where stakeholders identified challenges to the local authorities, including the widespread lack of capacity in managing and utilising energy management systems. Harmonising energy consumption data was stressed as essential for effective analysis and recommendations. It was agreed, that without proper procedures, energy management systems can lead to unnecessary financial and time expenditures. The utility of iBRoad2EPC was underlined as a suitable tool to incorporate into local and/or national strategic planning, aligning the set targets with those in iBRoad2EPC plans. Thus, the discussion made a smooth transition to the last panel, the round table organized under iBRoad2EPC project where the focus was on building certification and the certification of building professionals. Key panellists were representatives from EnEffect, the Sustainable Energy Development Agency, the Chamber of Architects in Bulgaria, and the Bulgarian Construction Chamber.

At the beginning of the discussion, Stanislav Andreev (EnEffect) highlighted the main challenges in Bulgaria's building certification process, including complex methodologies and high costs, as well as the lack of adequate training courses for EPC assessors and effective quality control. The representative from the Sustainable Energy Development Agency emphasised the importance of smart building energy management systems and called for simpler software solutions for building modelling. Dragomir Tzanev (EnEffect) then gave a brief introduction to iBRoad2EPC goals and features, commenting on the need for a tool facilitating energy auditing and at the same time providing the added value of a new product for step-by-step renovation that also incorporates future changes in national legislation coming from the EED and EPBD. He then presented results from the field tests of the iBRoad2EPC tool in Bulgaria, which have yielded highly positive results, with energy auditors and building owners finding it user-friendly, efficient, and valuable. On-site work typically ranged from 3 to 12 hours, including fine-tuning with building owners. The use of the assistant tool added just 1-2 hours on top of the efforts for development of standard EPC for most experts, who appreciated its simplicity. While auditors support the importance of site visits and the need to consider multiple renovation plans, they also highlighted the preference for online forms and the tool's clear, graphical interface. Overall, both auditors and owners found the tool and its elements extremely beneficial.

The representative from the Bulgarian Chamber of Architects expressed willingness to collaborate with iBRoad2EPC on the way it could be utilised in relation with future programs for financing energy efficiency in buildings. The representative from the Bulgarian Construction Chamber highlighted the need for skilled labour and continuous training in the sector, referring to the training materials developed under iBRoad2EPC that can be a useful base for future training courses and support the update of the official training materials used during the certification of energy auditor. The session concluded with Dragomir Tzanev (EnEffect) stressing the importance of mandatory training modules and multi-level control, i.e. control during all stages of the renovation process, from the EPC issuance to the completion of construction works, in future energy efficiency programmes and that iBRoad2EPC can aid to these challenges.

Final NAC meeting

The primary objective of the meeting was to present the results of the field tests to the NAC, serving as a basis for discussing how the project outcomes can contribute to the development of national legislation and the improvement of regulations related to EPCs.

Alexander Stankov (EnEffect) greeted the members and made a brief overview of the purpose of the meeting and the main topics to be discussed. He then jumped straight to the main questions at stake, as no further introduction was necessary since all experts were present in the roundtable discussions. He went more in depth into the findings from the field tests of the iBRoad2EPC tool in Bulgaria and also presented the main takeaways derived from the field test evaluation in the context of Task 4.3. The presentation included the feedback from the auditors on the additional efforts, on top of the issuing of standard EPC, to deliver the renovation roadmaps to the users. The features of iBRoad2EPC, including the Indoor

Environmental Quality (IEQ) and Smart Readiness Indicator (SRI), were widely regarded as very useful by the auditors.

Building owners also reported finding the iBRoad2EPC renovation roadmap extremely useful. They particularly appreciated the ability to compare the effects of individual renovation steps, better understand their obligations, and found the graphical representation and user-friendly interface of the tool to be highly beneficial. Overall, building owners found all elements of the iBRoad2EPC to be easy to understand, making it a valuable resource in their renovation planning.

Aleksander Stankov (EnEffect) concluded by stating that setting good triggers and training future energy auditors is key to the success of the tool's implementation, whether it is this project or another development, for example at state level. Next off, he gave the floor to the experts present for questions, views and comments.

The representative from Bulgaria Sustainable Energy Development Agency (SEDA) expressed his satisfaction with the results from the iBRoad2EPC field tests and stated the importance of step-by-step renovations of residential buildings as very useful in bridging the gap between residential and public renovation rates in the country⁵. He once again highlighted the importance of intelligent building energy management systems, which play a crucial role in the SRIs outlined in the new EPBD. He voiced concern about the absence of a market-driven ecosystem for energy-efficient services and the heavy dependence on grant-funded mechanisms, which are main hindrances to a well-running larger scale building renovation.

The representative of Bulgarian Energy Efficiency and Renewable Sources Fund (EERSF) added that the EPBD gives very clear guidelines for policies, with a timetable for implementation and specific targets for non-residential buildings and for residential buildings. He wished best of luck to the project and expressed his willingness to follow the future developments.

Stanislav Andreev (EnEffect) highlighted that these specific targets can be included in iBRoad2EPC. He added that the tool can also be used at local level such as plans given to a municipality to link with energy audits in the area.

The representative from the consulting firm AMP Consult shared her opinion as an auditor who participated in the iBRoad2EPC field test, expressing her praise for the tool, especially its user-friendliness and its ability to streamline an auditor's workflow significantly. The assistant feature was also praised, cutting down the time usually spent preparing reports while ensuring that no critical details are missed. The ability to compare different renovation scenarios and the inclusion of new features like the Smart Readiness Indicator were also mentioned, making the process not just efficient, but also comprehensive.

Key takeaways - stakeholders views

- iBRoad2EPC could be incorporated within local and/or national strategic planning to include the set targets so that unnecessary financial and time expenditures due to the lack of proper procedures can be avoided.
- Bulgaria's building certification presents special challenges due to complex methodologies and high costs making smart building energy management systems and simpler software such as iBRoad2EPC extremely important.
- Representatives from the Chamber of Architects and the Bulgarian Construction Chamber expressed their willingness to collaborate with iBRoad2EPC on the way it could be utilised in relation with energy efficiency programmes, and the need for ongoing education in the building sector.
- The need for simplified procedures, continuous training, and accountability mechanisms in the energy efficiency sector can all be supported by iBRoad2EPC.

⁵ Very high percentage of public buildings in Bulgaria are already renovated while the residential buildings are not, due to insufficient national support and lack of EPCs.

- The energy experts appreciated the simplicity of the iBRoad2EPC assistant tool which added just 1-2 hours for most experts, whereas in cases that the iBRoad2EPC recommendations were fully utilised from the outset there was often no increase in work time compared to a standard audit. Its web-based nature and clear graphical interface were very positively received. Overall, both auditors and owners found the tool and its elements extremely beneficial.
- The field test results demonstrated that building owners found all elements of the iBRoad2EPC to be easy to understand, making it a valuable resource in their renovation planning. The ability to compare different renovation scenarios and the inclusion of features like the Smart Readiness Indicator make iBRoad2EPC not just efficient, but also comprehensive.

Greece

The roundtable discussion with stakeholders to assess the iBRoad2EPC potential in Greece took place on 17 May 2024, in the context of the 1st Policy Forum of the EPBD.wise Life project⁶ which provides direct support to local authorities in six European countries (Bulgaria, Greece, Hungary, Poland, Romania and Ukraine) for the design and implementation of the revised Energy Performance of Buildings Directive (EPBD). The event was held as a physical event at the Amalia Hotel in Athens, Greece. The policy forum was attended by a total of 26 participants from various stakeholder groups.



Figure 1: Photo of the iBRoad2EPC stakeholders' Roundtable in Greece.

Agenda of the event

The agenda of the event is available online⁷. The discussion dedicated to the iBRoad2EPC assessment was held under the “Building Renovation Passports” session and was held between 14:00-15:30 local time (1,5-hour duration) (Table 2 below). It included 4 presentations (1 from the local project partner INZEB and 3 from energy auditors who participated in the field test) followed by a moderated panel discussion.

⁶ <https://www.bpie.eu/epbdwise/>

⁷ https://inzeb.org/wp-content/uploads/2024/05/EPBD.wise_Policy-Forum-Greece_17.05.2024_v1.1_EN-simple.pdf

Description	Presenter	Time
BUILDING RENOVATION PASSPORTS (Joint session with iBRoad2EPC H2020 project)	Moderator: Eleftheria Touloupaki, INZEB	14:00-15:30
The iBRoad2EPC project progress in Greece	Eleftheria Touloupaki, INZEB	14:00-15:15
Experiences from the iBRoad2EPC Field Tests in Greece	Olga Rozou, Energy Inspector Periklis Zolkou, Energy Inspector Stavros Spyridakos, Energy Inspector	
Conclusions and Next Steps	Alice Corovessi, INZEB	15:15-15:30

Table 2: Agenda of the iBRoad2EPC Roundtable in Greece

Presentations and discussion topics

Alice Corovessi (INZEB) welcomed the Policy Forum Participants and presented the objectives of the event, outlining also the involvement of INZEB with Renovation Passports since the iBRoad project in 2017. The first session of the Policy Forum was dedicated to the EU policy updates regarding Energy Efficiency and the presentation of the EPBD.wise project, which organised the host larger event. The second panel of the Policy Forum started with the presentation of 6 best practice cases relevant to the evolution of EPCs and building Renovation Passports. Dr Margarita Petroligaki (Ministry of Environment and Energy) proceeded to present the future progress and challenges regarding EPCs in Greece and then a moderated discussion took place focusing on the renewed role of EPCs after the latest EPBD recast and its challenges (rescaling ratings from A-G, public reaction, increased demand for energy efficiency funding, etc.).

After the lunch break, the session dedicated to iBRoad2EPC started with the presentation of Eleftheria Touloupaki (INZEB) which introduced the iBRoad2EPC concept, methodology, and tools to the participants. A brief demonstration of the iBRoad2EPC Assistant and outputs of the online tool was followed by an overview of the training of auditors and field-testing results in Greece. Then, three (3) of the energy auditors that participated in the Greek field test shared short statements describing their experience from using the tool in practice. They highlighted the user-friendliness of the Assistant interface, the added value of the iBRoad2EPC related to EPC recommendations and preparation notes, as well as the additional time needed to prepare it, which ranged from a few hours to 2-3 working days depending on the complexity of the buildings tested.

The discussion unravelled the framework necessary to effectively adopt Renovation Passports. Forum participants discussed legislative alignment, compliance strategies, and the level of complementarity between EPCs and Renovation Passports to elevate energy efficiency standards nationally. They also discussed their possible link with one-stop shops. Finally, Alice Corovessi and Eleftheria Touloupaki from INZEB concluded the event and thanked the participants for their useful insights.

Key takeaways - stakeholders views

- The stakeholders were impressed by the ease in which iBRoad2EPC produces a Renovation Passport due to of the pre-filled text blocks and the dynamic nature of the output document because of the QR code-link that follows all changes made by the energy experts.
- Bank representatives expressed their confidence that a tool like iBRoad2EPC can aid in the business plan preparation for renovation/energy efficiency upgrade loan applications and that they prefer it from EPCs for this scope.

- The energy experts said that they found iBRoad2EPC easy to use and that the amount of effort needed to prepare the output document may vary depending on the type of building examined and the depth of analysis of individual parameters in each module by the auditor.
- Regarding the adoption potential of iBRoad2EPC, it was mentioned that the cost of the Renovation Passport may deter building owners from issuing it in a voluntary basis (as is the case currently with EPCs), and therefore a funding scheme is considered very important.
- After a live demonstration given by INZEB to the technical and administrative staff of the Ministry of Environment and Energy, the Ministry representative confirmed that they are willing to test iBRoad2EPC's integration with the Greek EPC database "Buildingcert". The Ministry representative also agreed that iBRoad2EPC can possibly fulfil Greece's obligation to establish an official Renovation Passport in line with Article 12 of the 2024 recast EPBD.

Poland

The roundtable discussion to assess iBRoad2EPC in Poland was held on 28 May 2024 starting at 12:00 CET in person, as a standalone event at the headquarters of the Ministry of Economic Development and Technology (MRiT) in Warsaw. The meeting lasted three hours and was attended by three (3) representatives of KAPE, six (6) representatives of MRiT, one (1) representative of the Association of Energy Auditors and one (1) representative of the European Climate Foundation (ECF) (in total, 11 persons participated in the discussion).



Figure 2: Photo of the iBRoad2EPC stakeholders' Roundtable in Poland

Agenda of the event

The agenda of the Roundtable in Poland is shown in Table 3 below.

Description	Presenter	Time
Part I. Presentation of the proposed concept, methodology and content of iBRoad2EPC	Karolina Junak	12:00-13:00
Part II. Demonstration of iBRoad2EPC creation in the assistant	Piotr Zdanowski	13:00-13:30
Part III. Questions about iBRoad2EPC	Karolina Junak	13:30-14:00
Part IV. Discussion to define the feasibility of iBRoad2EPC national rollout and technical adaptation	Karolina Junak	14:00-15:00

Table 3: Agenda of the iBRoad2EPC Roundtable in Poland.

Presentations and discussion topics

Karolina Junak welcomed the participants and proceeded to present the agenda of the event. The first session of the event concerned the presentation of the proposed concept, the methodology and contents of iBRoad2EPC and in particular:

- The iBRoad family that evolved to the iBRoad2EPC concept, methodology and tool
- The aspects of long-term planning and cost-effectiveness
- The role of iBRoad2EPC in fulfilling these requirements
- The pilot testing of iBRoad2EPC in Poland
- The ways in which iBRoad2EPC can help implement Article 12 of the 2024 recast EPBD

The next session consisted of a demonstration of the necessary steps for the creation of an iBRoad2EPC using the online assistant. For this reason, a sample building project was prepared in the assistant to clarify all iBRoad2EPC assumptions and practical details.

After the demonstration of the sample iBRoad2EPC project, it was time for questions followed by a discussion to define the feasibility of iBRoad2EPC national adoption and technical adaptation. The first question from stakeholders was whether iBRoad2EPC is a calculation programme, or it is only used to enter data from the Energy Performance Certificate. It was explained that the tool is used to enter data already calculated by the auditor and that it does not perform any calculations on its own. The next question concerned the training of auditors, how long it takes, and the flexibility of auditors to enter data into the assistant on their own. It was explained that one 3-hour training session with an input demo was enough for auditors to be able to use the tool customising the text blocks and its features, and that a manual for auditors and a hotline from KAPE is available to address all inquiries that the experts may have.

The third question concerned the iBRoad2EPC modules and customisability. The modularity/flexibility behind the architecture of iBRoad2EPC was explained, the basis on which the energy upgrade measures can be selected, the origins of the IEQ and SRI methodologies adopted in the iBRoad2EPC concept, and the flexibility to add to the tool's architecture additional modules in the future.

After the Q&A session, a discussion started on the potential for implementing iBRoad2EPC in Poland and the obstacles this may pose. The Ministry representatives stated that it is not yet known how Renovation Passports could be implemented in Poland but iBRoad2EPC is considered a very promising solution. They highlighted their intention to review the information in the manual and on the website and examine whether Renovation Passports should be mandatory or voluntary. The use of Renovation Passports (e.g., in the form of iBRoad2EPC) has been proposed as a tool to support thermal modernisation programmes. The building owner would receive an action plan, and the departments responsible for the programmes could, based on

the renovation plan, confirm the achievement of the relevant goals. Stakeholders stated that this could improve the operation of subsidy schemes.

An obstacle identified is the low level of knowledge of authorised EPC issuers; to address this, the Ministry is considering introducing higher requirements to obtain authorisation or creating additional courses and exams on EPC issuing. Regarding training procedures, it would be possible to combine EPCs and Renovation Passport training courses.

Participants further recognised the need for developing information campaigns for building owners in order to promote the advantages of Renovation Passports.

The final point of discussion was the EPC database and its possible interlinkage with iBRoad2EPC. At the moment, the EPC database contains little information and checking any data is difficult. The Ministry is aware of the database's infirmity and is working on an improved version. After the implementation of improvements, it would be possible to link the .xml file of the EPC to the iBRoad2EPC Assistant and facilitate the document creation. The Ministry representative declared that there is high interest in the iBRoad2EPC results, and that they want to be updated on the results of the project and are willing to cooperate on the topic of Renovation Passports.

Key takeaways - stakeholders views

- It is not yet known by the Ministry how Renovation Passports could be implemented in Poland but iBRoad2EPC is considered a very promising solution and there is intention to review the information in the manual and on the website and examine whether Renovation Passports should be mandatory or voluntary.
- The Ministry representative declared that there is high interest in the iBRoad2EPC results, and that they want to be updated on the results of the project and are willing to cooperate on the topic of Renovation Passports.
- Stakeholders said that iBRoad2EPC could improve the operation of subsidy schemes.
- An identified obstacle is the low level of knowledge of authorised EPC issuers; to address this, the Ministry is considering introducing higher requirements to obtain authorisation or creating additional courses and exams on EPC issuing.
- It will be necessary to develop an information campaign for building owners to promote the advantages of Renovation Passports.
- At the moment, the EPC database contains very little information and checking any data is difficult. After the implementation of improvements, it would be possible to link the .xml file of the EPC to the iBRoad2EPC Assistant and facilitate the document creation.

Portugal

The iBRoad2EPC stakeholder roundtable in Portugal was held on 27 June 2024, online, as a standalone event using the Academia ADENE infrastructure⁸. It addressed the concepts and principles of a building Renovation Passport, the national and European strategies and plans in force and future perspectives, namely the new obligations associated with the recent recast of the European Energy Performance of Buildings Directive.

The main results of the testing phase in Portugal were also presented, which included the evaluation of 10 buildings of different types (offices, schools, multi-family and single-family buildings). Finally, two round tables were held to discuss the perspective of the qualified experts involved in the testing phase and the representatives of institutions that collaborated in the project by providing the buildings for testing, such as SCML - Santa Casa Misericórdia de Lisboa, Construção Pública E.P.E., GEBALIS - Gestão do Arrendamento da Habitação Municipal de Lisboa, E.M., S.A. A total of 31 attendees (including ADENE representatives) joined the roundtable discussion, among them policy makers, industry, scientific community, professionals and consumers representatives.

On the same day, following the conclusion of the roundtable, the final Portuguese NAC meeting was also held online between three (3) stakeholders and ADENE representatives, to delve deeper into several aspects of the field test and the iBRoad2EPC tool. It also had the ambition of examining more in detail the potential options for future development of the iBRoad2EPC and Renovation Passport in relation to the EPBD.

Agenda of the event

The agenda of the roundtable discussion in Portugal is presented in Table 4.

Description	Presenter	Time
Welcome	Joana Fernandes, ADENE	9:30-9:45
The new Energy Performance of Buildings Directive (EPBD): key provisions and challenges	Rui Fragoso, ADENE	9:45-10:00
Results of iBRoad2EPC project: platform for issuing renovation passports and testing phase in Portugal	João Cleto, ADENE	10:00-10:20
Round Table I "What are the advantages and challenges of the Renovation Passport for a PQ?" <i>Qualified Experts (PQ's) involved in the iBRoad2EPC project</i>	Moderator: João Cleto, ADENE	10:20-10:40
Round Table II "Challenges of building renovation and the role of the Renovation Passport" <i>Entities: SCML - Santa Casa Misericórdia de Lisboa, Construção Pública E.P.E., GEBALIS - Gestão do Arrendamento da Habitação Municipal de Lisboa, E.M., S.A.</i>	Moderator: Joana Fernandes, ADENE	10:40-11:00
Final conclusions	Joana Fernandes, ADENE	11:00-11:15

Table 4: Agenda of the iBRoad2EPC roundtable in Portugal

⁸ <https://academia.adene.pt/sessao-ibroad2epc-passaportes-de-renovacao-dos-edificios-resultados-finais/>



Figure 3: Screenshots from the iBRoad2EPC stakeholders' Roundtable in Portugal

The NAC meeting agenda was split in two parts, the first focusing on the project results with the following specific sub-topics:

- Summary of the national roundtable
- Detail of project results and evaluation by experts and owners
- Evolution of the tools compared to the last meeting and integration of contributions from NAC members and qualified experts (PQs)
- Relationship with other projects and initiatives (Next Gen EPC Cluster and SRI2MARKET)

The second part of the final NAC meeting consisted of 35 minutes of discussion with three (3) stakeholders about the possibilities for the future development and integration of iBRoad2EPC and its relationship with the transposition of the EPBD recast in Portugal, along with the next steps to take towards that direction.

Presentations and discussion topics

Roundtable discussion

The first two sessions of the roundtable consisted of presentations on the key provisions and challenges of the new Energy Performance of Buildings Directive (EPBD), and the results of the iBRoad2EPC project, respectively. The discussions that followed at the subsequent roundtables are summarised below.

Round Table I: "What are the advantages and challenges of the Renovation Passport for a PQ?"

This roundtable was attended by Qualified Experts (here onwards referred to as PQ's following the Portuguese abbreviation) involved in the iBRoad2EPC project. They presented their experience during the field-testing phase of the tool in Portugal as follows:

- The first energy expert introduced his work on a Santa Casa da Misericórdia building in Rua Leandro Braga, highlighting the need for major renovation and energy improvement measures. The project aimed to enhance the building's energy performance to meet global standards.
- The second expert presented her case study from the University of Minho, focusing on a small "island" (traditional informal settlements) in Porto with six single-family houses. The houses suffer from energy inefficiency and energy poverty, presenting common issues like humidity and poor heating. The expert faced challenges with landlords who were reluctant to invest in energy-efficient solutions.
- The third expert linked the field test to his PhD work on sustainable energy systems at MIT Portugal. He studied a two-house building, using advanced tools to explore community-scale energy solutions. The expert emphasised the potential of neighbourhood-level projects over individual ones, noting the importance of return on investment and community involvement.

A discussion followed where the second expert highlighted the challenges of overcoming prejudices against energy-efficient measures. She navigated the constraints posed by landlords who were hesitant to adopt certain technologies due to cost concerns. The first expert continued to emphasise the need for community-level solutions, arguing that individual interventions are often costly and less effective. He suggested that municipalities could play a crucial role in facilitating energy communities and shared infrastructure. Finally, the expert shared his work with drone technology for dynamic simulation and planning. He pointed out that digitalisation could enhance the effectiveness of energy renovations, especially when applied at the community level. The discussion acknowledged the potential for integrating digital tools and community-level planning to address energy efficiency challenges more comprehensively.

The link with the revised Energy Efficiency Directive (EU/2023/1791), which challenges municipalities with over 45,000 inhabitants to develop local heating and cooling plans was also highlighted. This directive emphasises regional cooperation and the inclusion of various stakeholders. Specifically, participants discussed the directive's focus on solar energy, highlighting the need for a diversified approach that includes solar thermal and other renewable technologies.

Round Table II: "Challenges of building renovation and the role of the Renovation Passport"

This roundtable revolved around the experiences and challenges faced by organisations involved in building renovation and maintenance which collaborated with iBRoad2EPC by providing some of their buildings for the test phase. Key stakeholders shared insights on how they manage large portfolios of buildings, the role of new technologies, and the importance of strategic planning for energy efficiency.

Joana Fernandes thanked the participating entities for their collaboration in the project. She acknowledged the tireless efforts from Santa Casa da Misericórdia de Lisboa (SCML), Construção Pública EPE, and GEBALIS, emphasising the importance of their role in meeting new challenges in building renovation.

The representative from SCML highlighted several challenges such as the difficulty in aligning interests among tenants, landlords and other stakeholders, especially in multi-family buildings where subleases can complicate deep renovations, as well as the uncertainty of lengthy processes with local government approvals. The same representative referred that the renovation passport should be as aligned/streamlined as possible with the EPC system as the need for additional documentation can cause stress, particularly in the private sector where there is pressure for quick turnaround times.

The representative from Construção Pública EPE discussed the challenges in the public sector such as the difficulty in involving multiple stakeholders, including managing and political decision-makers. For state-owned buildings, the absence of financial benefit from energy savings makes stakeholder engagement even more challenging which highlights the importance of involving users in energy-saving measures as they don't feel direct financial impacts, leading to a lack of motivation to reduce consumption. He also highlighted the challenges in planning with rapidly evolving technologies and regulatory landscapes. The uncertainty around

future technology viability, such as heat pumps versus traditional boilers, complicates decision-making. Some coping strategies were identified with focus on the importance of regular maintenance and strategic planning to ensure building longevity and implementation of solar and LED systems in schools, noting initial success but challenges in sustaining user engagement.

The stakeholder from GEBALIS stressed the concrete difficulties in sourcing and certifying new materials suitable for existing structures and, also, the difficulty to integrate smart systems due to cost constraints and lack of expertise. Problems with accessing accurate cadastral information and the complexity of auditing numerous residential units were also addressed. He gave an important perspective on costs and the need to even-out the cost of renovation with the need for energy efficiency. He also stressed the importance to invest in comprehensive training at all levels, from workers to decision-makers, to ensure understanding and implementation of new energy standards. The stakeholder also emphasised the need for investment in Building Information Modelling (BIM) technology to improve planning and execution of renovation projects.

The final discussion underscored the importance of building Renovation Passports as tools for long-term planning, despite the challenges in adoption due to cost and time constraints. There was consensus on the need for clearer regulations and incentives to encourage the uptake of Renovation Passports, particularly in the private sector.

Final NAC meeting

João Cleto from ADENE led the meeting through a presentation detailing the progress made over recent months, including the integration of various new features such as the XML integration. He clarified that the full development of certain features such as the full integration with the casA+ platform is out of the scope of the iBRoad2EPC project, though significant progress has already been made in this direction.

The importance of addressing energy poverty in future developments was highlighted. The role of the Digital Building Logbook and one-stop shops that are being set-up in Portugal were referred as major opportunities for the Renovation Passport. The integration of iBRoad2EPC with ongoing projects and European initiatives was detailed, including SRI2MARKET⁹, CA-EPBD¹⁰ and EPBD.wise¹¹, where ADENE is a partner. Integration of the Smart Readiness Indicator (SRI) in the iBRoad2EPC Assistant was presented, with improvements in integration and synergies among projects positively noted.

Experts feedback on the testing phase was detailed and covered its usability, the integration of external tools such as the IEQ and SRI spreadsheets, areas needing improvement and also suggestions for further development. Specifically, the NAC members provided suggestions such as the inclusion of a neighbourhood and energy communities module in the future, as well as further integration of the SRI and IEQ modules into the Assistant itself instead of uploading excel files. Also, they mentioned the need to resolve some minor visualisation issues in the final iBRoad2EPC document along with the importance of developing a different printable version of the iBRoad2EPC document or enhanced EPC (for instance a summary version), without the need of using a QR code, as some people don't know how to access it. The contents of the iBRoad2EPC databases could use some additional fine tuning to reduce confusion in naming conventions and provide clearer guidance on energy consumption metrics. Also, the stakeholders suggested some enhancements to the templates used during site visits.

There was mixed feedback about the module on energy cost savings, with some experts expressing concerns that the energy cost savings estimated with current prices can create unrealistic expectations. Improvements in the approach and communication are needed to provide more accurate assessments of the cost savings. The MEPI module could contribute to this, but the current assessment methodology is probably too complex to be extensively used.

⁹ <https://sri2market.eu/>

¹⁰ <https://www.ca-epbd.eu/>

¹¹ <https://www.bpie.eu/epbdwise/>

The iBRoad2EPC tool was generally well-received for its ease of use, though there were concerns about the additional work required on top of EPC assessment which is already quite time-intensive in some cases. Streamlining, i.e. aligning and automating, Renovation Passports with EPCs issuance should be a priority when implementing this new tool in the national landscape. It was noted that iBRoad2EPC is very efficient in handling information input. The XML integration, although not extensively tested, reduced a lot the time needed to input information compared to manual filling of the different fields. In terms of costs, the average expected additional fee for issuing an iBRoad2EPC in comparison with the energy performance certificate ranges between 25% to 100% of the current price, with a consensus around 60%.

Adaptations to external tools and databases, such as the Portuguese EPC/casA+ improvement measures database, have been performed throughout the iBRoad2EPC testing phase and follow a continuous improvement process. Significant progress has been made during the project duration but some challenges remain, particularly with coherence across different databases and updating of external tools (SRI and IEQ) to align with the Portuguese norms. This has been successfully delivered but there was not time for extensive testing of the updated tools. Future steps could include developing and testing API integrations with platforms like the Energy Certification System for Buildings (Sistema de Certificação Energética dos Edifícios - SCE) portal and the online national one-stop shop CasA+. Specifically, casA+ can be enhanced with Renovation Passport features by creating a link with iBRoad2EPC. Possible implementation will be undertaken in 2024/2025, following the Recovery and Resilience Plan funding.

Future exploitation was discussed: despite the project coming to an end, iBRoad2EPC and BPAC will ensure maintenance for at least two more years. This includes the possibility of conducting additional tests. An English version of the tool will be available for use by other countries, based on the advanced Portuguese version. The decision on how to proceed with the tool's use and potential adaptations will be based on strategic considerations and specific country needs but also the current EPBD transposition work that is being led by ADENE, current updates foreseen for the casA+ platform and opportunities arising from other EU projects and initiatives.

The consumer's association (DECO) representative highlighted a potential interest for testing iBRoad2EPC in municipalities outside of Lisbon. Specifically, municipalities from various regions, including those more inland, have shown interest.

The representative from the construction companies' association (AICCOPN) will explore potential for involving construction companies and other stakeholders in additional testing but also for disseminating the training materials built within iBRoad2EPC. Though current training efforts have mainly focused on training the auditors involved in the project, there is also a need for comprehensive training for construction professionals. The potential to integrate the iBRoad2EPC tool training into existing courses on building rehabilitation and sustainability delivered by Academia ADENE to construction professionals is being considered. There was agreement that further adaptation of the training (for instance adding some dedicated material in Portuguese) could be taken up as part of future work together with a continuous update of the rollout plan in line with the EPBD transposition.

Finally, it was agreed that ADENE will keep lines of communication with national advisory committee members open for ongoing feedback during the EPBD transposition process and iBRoad2EPC additional tests/fine tuning. This will allow for additional discussions on potential future projects and tool enhancements.

João Cleto from ADENE thanked all attendees for their contributions and acknowledged the hard work and advancements made in the project. He emphasised the importance of continued collaboration and feedback to ensure the tool's success and relevance for future projects.

Key takeaways - stakeholders views

- Effective coordination among stakeholders is crucial for successful renovation projects and long-term planning is necessary to adapt to rapidly changing technologies and regulations. The long-term perspective of iBRoad2EPC along with its dynamic nature can address these challenges.

- Enhanced training and awareness raising are considered vital by stakeholders in order to achieve energy efficiency goals. iBRoad2EPC can aid to raise awareness through its user-friendly interface and simplified outputs for building owners. Additionally, clear policy guidelines and incentives are needed to drive the adoption of Renovation Passports and energy-saving measures.
- Energy efficiency projects benefit significantly from community-level approaches rather than isolated individual interventions. Grouping of projects should be preferred when possible.
- The revised Energy Efficiency Directive (EU/2023/1791) requires active involvement from municipalities, promoting regional cooperation and a holistic approach to heating and cooling needs. The Renovation Passport can also have an important role in achieving these objectives.
- Digitalisation of procedures, including the use of dynamic modelling and the use of BIM solutions, are important parameters that should be considered and be integrated in the Renovation Passport procedures to ensure long-term feasibility of the relevant concepts and tools.
- The online national one-stop shop (portal casA+) can be enhanced with Renovation Passport features, such as the long-term perspective and upgrade measures database, by creating a link with iBRoad2EPC. Possible implementation will be undertaken in 2024/2025, following the Recovery and Resilience Plan funding.
- Further cooperation with the national consumers association was agreed with a focus on territorial dispersion and addressing rural and inland areas. This also relates with the need to future engagement and dissemination within municipalities that will be the recipients of the one-stop shops.
- Other relevant and related issues, such as energy poverty, should be hard linked to the Renovation Passport alongside the role of the Digital Building Logbook.
- There is a need for comprehensive training for construction professionals, and AICCOPN can potentially provide support; this will be further investigated. Also, the integration of iBRoad2EPC training into existing courses on building rehabilitation and sustainability delivered by the Academia ADENE will be further assessed.
- Strategic considerations and specific country needs arising from the current EPBD transposition work that is being led by ADENE will pave the way for the iBRoad2EPC tool's use and potential adaptations in Portugal.
- Continuous cooperation among NAC members will proceed, especially under the EPBD transposition process where ADENE will have a leading role.

Romania

The stakeholders' consultation on iBRoad2EPC implementation in Romania was organised on 18 May 2024 during the nZEB Week Constanța 2024 event¹², in physical form, at Vivo Mall in the city of Constanța. The overall objective was to introduce the results of the iBRoad2EPC project and to discuss potential implementation of the developed preliminary solutions in Romania. Previously, on 15 May 2024, the final iBRoad2EPC NAC meeting had already been organised online to present a summary of project results (final training materials, update on the iBRoad2EPC Assistant, results of the field test etc.) to discuss implementation possibilities in Romania.

Agenda of the event

The agenda of the roundtable, which was similar to that of the final NAC meeting in terms of topics discussed, is presented in Table 5:

Description	Presenter	Time
Participants registration	-	13:50 - 14:00
Introduction	Horia Petran, INCĐ URBAN-INCERC	14:00 - 14:10
- The iBRoad2EPC project in brief: Transition from Energy Performance Certificate (EPC) to Renovation Passport (RP) - Training materials available - The iBRoad2EPC assistant - Results of the first field evaluation phase of the iBRoad2EPC implementation - Possible implementation in Romania	Horia Petran, INCĐ URBAN-INCERC	14:10 - 14:40
Roundtable discussions: - Identification of necessary adaptations of iBRoad2EPC and prospects for national adoption in the context of the new EPBD - Recommendations for implementation - iBRoad2EPC integration into EPCs - iBRoad2EPC assistant integration/connection with the digital building register and/or with the MC 001-2022 calculation programs, - Financial and non-financial incentives for phased renovation	All participants	14:40 - 15:20
Conclusions on the potential of iBRoad2EPC implementation and stakeholder's involvement	All participants	15:20 - 15:30

Table 5: Agenda of the iBRoad2EPC Roundtable in Romania

A total of 20 stakeholders participated in the roundtable discussion, mostly building energy auditors and designers/consultants. The NAC meeting was attended by 8 stakeholders.

¹² <https://www.pro-nzeb.ro/articol-pro-nzeb/saptamana-nzeb-constantia-17-19-mai-2024/>

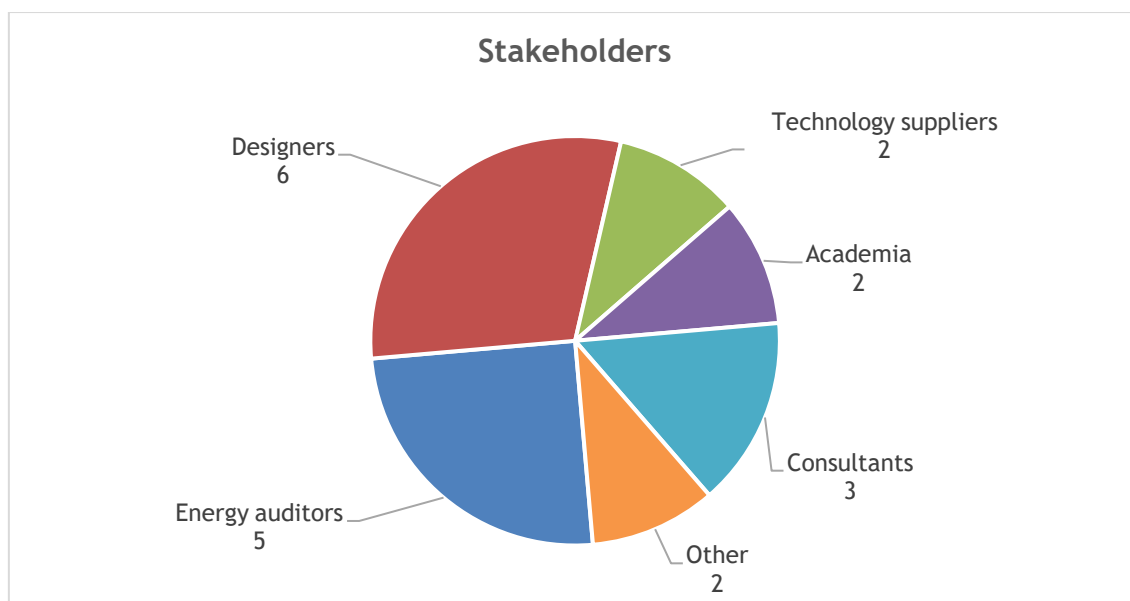


Figure 4: Overview of the participants of the Romanian roundtable discussion

Presentations and discussion topics

Roundtable discussion

The presentation given by Horia Petran (INCD URBAN-INCERC, project partner) included the overall iBRoad2EPC concept, the results achieved, including the iBRoad2EPC Assistant and training modules, and the results of the field test of iBRoad2EPC. iBRoad2EPC is considered by energy auditors to be a very useful tool, with an easy to use assistant and good graphics, enabling a better understanding of the energy performance and solutions to improve it for the building owners, but is considered difficult to include this approach in the current practice of energy auditors.

The building Renovation Passport is not mandatory at this stage. The iBRoad2EPC could be a simplified version of the Renovation Passport, but a more detailed tool could be developed as part of the future Digital Building Registry (EPC database module). The implementation of iBRoad2EPC in the EPC scheme is considered feasible, but mostly if this will be required by the relevant technical regulations. The building energy auditors (the experts issuing the EPC and performing the energy audit of existing buildings) would use the iBRoad2EPC if it would be mandatory or if it would be included as an add-on tool (or embedded) in the existing EPC software they currently use.

The roadmap included in the iBRoad2EPC could be used for dedicated, staged financing, for staged renovations. Banks could be interested to develop dedicated renovation loan products for deep staged renovations, and iBRoad2EPC could be used to facilitate the disbursement of staged financing for specific renovation steps for an agreed deep energy renovation plan.

Final NAC meeting

The progress and the preliminary results of the field test of iBRoad2EPC were presented Horia Petran (INCD URBAN-INCERC, project partner). Specifically, information on the training of auditors (> 60 participants), the open calls and the contracts for the five buildings (with a total floor area of 2335 m²) that have already been tested was shared. The intention to call for the assessment of additional buildings was also shared with the participants.

Stakeholders agreed that the iBRoad2EPC layout/format, graphics and features are very good. All the developed modules are considered useful and possible to implement, except for the MEPI module, for which reliable information is not likely to be found in practice.

The implementation of iBRoad2EPC in the EPC scheme is considered feasible, but mostly if this will be required by the relevant technical regulations.

At the moment, there is no functional database with EPCs and the transmission of EPCs developed by the energy auditors is not regulated in a unified and automated way so that it can be easily linked to a future building Renovation Passport. However, a digital building registry is currently being prepared by MDLPA and there are preliminary discussions with other ministries (e.g., Ministry of Research, Innovation and Digitalisation) to develop tools for the automatic extraction of information from existing EPCs (submitted in various formats with hard to extract/utilise data), resulting in populating a digital building registry type system.

The Renovation Passport is not mandatory at this stage. The Terms of Reference for the digital building registry is under final definition stage, and it is useful to include iBRoad2EPC as an example of good practice or model of a Renovation Passport. In this context, it should also be useful to define how the links between the various modules of the registry and iBRoad2EPC should be made. It would be very useful for the Digital Building Registry to contain a module to provide the roadmap (iBRoad2EPC) to track whether the building is on a set performance route at a certain point in time and to track whether certain requirements are met.

There is a need to join the efforts of software vendors to develop EPCs or elaborate building energy audits. The organisation of a meeting between the representatives of EPC software producers (DosetPEC¹³, AllEnergy¹⁴, ENERGA¹⁵) and the iBRoad2EPC project team was proposed, to discuss the possibilities of connecting the two types of tools in Romania. At this time the discussion is still open.

The potential provision of iBRoad2EPC was discussed in the context of assessing the energy performance of public buildings and the possibilities for improvement to reach the level of nearly zero or zero-emission buildings, in line with Article 6 of the EED Directive (2023/1791/EU) on obligations to renovate a minimum of 3% of the stock of public buildings. The provision of a renovation plan for existing public buildings (e.g., roadmap developed by the iBRoad2EPC assistant) would facilitate the prioritisation of annual funding, opening the possibility of energy renovation funding for a larger number of buildings for which certain renovation milestones are implemented. This is a discussion to be held in the working groups for the transposition of the EED and EPBD Directives. This would also help operationalise and streamline the public building inventory (now extended from central government buildings to all public buildings).

iBRoad2EPC is also a useful tool to be included in financing, e.g., for financial instruments (bank loans), to facilitate the definition and implementation of staged financing for staged renovation (the whole renovation plan is initially assessed and the implementation of the phases according to the roadmap is agreed in correlation with the defined loan tranches).

Key takeaways - stakeholders views

- iBRoad2EPC is considered by the stakeholders to be a very useful tool, with an easy to use assistant and good graphics, enabling a better understanding of the energy performance and solutions to improve it for the building owners.
- The current practices of energy auditors for buildings make it difficult to integrate the iBRoad2EPC approach in the near future unless a legal obligation is in place or if iBRoad2EPC is included as an add-on tool (or embedded) in the existing EPC software.
- iBRoad2EPC could act as a simplified version of the building Renovation Passport, but a more detailed tool could be developed as part of the future Digital Building Registry (EPC database module).
- iBRoad2EPC could be used to apply for financing specifically addressed to stepwise deep renovations. Banks could develop dedicated renovation loan products for deep stepwise renovations, and iBRoad2EPC could be used to facilitate the disbursement of funds for specific renovation steps as part of an agreed deep energy renovation plan.
- The iBRoad2EPC Assistant should ideally be interconnected, in an automated way, with the EPC tools

¹³ <https://www.dosetimpex.ro/doset-pec/doset-pec.php>

¹⁴ <https://www.algorithm.ro/>

¹⁵ <https://energ-plus.ro/>

software tools, to have an already implemented calculation engine (and hopefully an approved one in the near future). If this does not happen, it is highly probable that the iBRoad2EPC Assistant will be not used, as it could be perceived as burdensome and with no added value.

- The information extracted from the iBRoad2EPC Assistant should be, at the same time, usable at other levels beyond the individual building. Ultimately, the information should be scalable through aggregation of coherent and harmonised data. The interoperability of data is one of the big objectives in Europe, so the tool should make it possible, or it would soon become obsolete.
- There is potential use identified in the preparation of the implementation of the 3% obligation for the yearly renovation of public buildings, by prioritising the buildings and packages to be financed each year.
- There is interest to discuss the possibility to include iBRoad2EPC in the actions related to the transposition of the EED and EPBD on the 3% obligation for public buildings yearly renovation, as part of working group discussions for transposing the EPBD in the national legal framework.
- It will be useful to organise joint meetings of EPC software providers to discuss the interest and possibilities to interconnect the iBRoad2EPC Assistant with the EPC software tools.

Spain

The roundtable discussion to assess iBRoad2EPC in Spain took place on 23 July 2024, online (webinar). The initially registered participants were 150, of whom around 70 showed up at the event, which lasted 1,5 hours starting at 12:00 local time. Among the participants were technicians from different renovation offices all over Spain, authorities such as the National Council of Architects (CSCAE), the National Council of Technical Architects (CGATE) and national entities such as the Observatory 2030. There was no separate final NAC meeting, rather 2 members of the NAC and an expert who participated in the field test were panel members during the discussion and received questions from the audience in the form of a debate.

Agenda of the event

The agenda of the event was as given in Table 6:

Description	Presenter	Time
Welcome	Alicia de la Fuente	12:00-12:10
Introduction	Ander Bilbao	12:10-12:20
iBRoad2EPC project	Alicia de la Fuente	12:20-12:35
Round Table	Ainhoa Mata, Albert Cuchi, Ana García, Ander Bilbao	12:35-13:15
Public questions and closing	Alicia de la Fuente, Dolores Huerta	13:15 -13:30

Table 6: Agenda of the iBRoad2EPC Roundtable in Spain

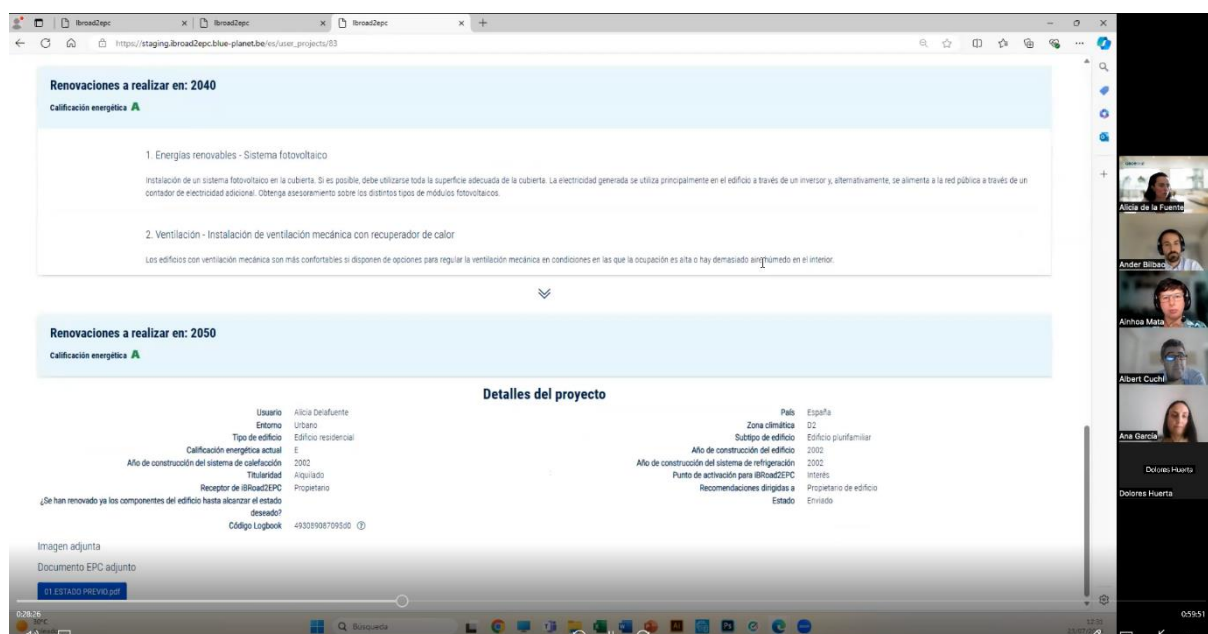


Figure 5: Screenshot from the iBRoad2EPC stakeholders' Roundtable in Spain.

Presentations and discussion topics

The event consisted of 30 minutes of presentation followed by 1 hour of roundtable discussion and questions. The presentation of the iBRoad2EPC project introduced the stakeholders to the activities of the project, the proposed concept, methodology and tools, as well as the field test results in Spain. The key points highlighted during the iBRoad2EPC presentation to the stakeholders were the integration of two instruments, i.e. the EPC and the Renovation Passport, iBRoad2EPC's long-term vision and step-by-step renovation structure, its characteristics as an intuitive and simplified tool which provides support for visualisation and communication between energy experts and building owners.

The questions held during the Roundtable and the key points of the conversation following each question are presented in Table 7:

Question	Key conversation points and suggestions for improvement
First-hand experience from an expert <i>Can you briefly explain your experience in the project? What advantages or strengths would you highlight? Also, what do you feel is missing that we could propose as future developments?</i>	The tool is very useful; the most interesting aspect is the visualisation of the roadmap. It goes beyond simply proposing specific improvement measures, as it incorporates both the property owner's desires and regulatory requirements. It should allow for the addition of improvement measures beyond the pre-established list/database of renovation measures.
EPC as a central instrument in the EPBD, integrated with other tools <i>How do you see the future of the EPC from your perspectives? How can we make this instrument a source of value for technicians and users, rather than just a mere formality?</i> <i>What level of integration can it have with new EPBD instruments like the Renovation Passport or the Digital Registry? And with existing ones like the IEE or LEE?</i>	The certification was created to inform property owners about the energy costs of their property. Transitioning this information, which primarily applies to appliances like washing machines and refrigerators, to buildings is insufficient. Certificates need to be professionalized alongside tools like the renovation passport, but we must ensure that these steps are simple; otherwise, people will get lost. They should be accessible and serve as effective communication tools.
The Renovation Passport and challenges for its implementation <i>What are the main challenges the implementation of the Renovation Passport will face? These could be technical, communication-related, or involve training for the auditors, etc.</i> <i>In this regard, how do you think tools like iBRoad2EPC can help overcome these barriers?</i>	A lot needs to be done in a very short time. It is essential that those who create these documents are trained or certified. The best renovation plan a country could have would be a document like iBRoad2EPC for each building, providing a clear path toward complete decarbonisation that is understandable for everyone. iBRoad2EPC is extremely useful for outlining the long-term needs for rehabilitation within a community. The main drawback of the Renovation Passport is its voluntary nature. It is crucial that these matters are regulated, but even more important is that people recognise that buildings require renovations, just as everyone is accustomed to changing their phone or car every few years. A good trigger for this was the MEPs, although they ultimately did not materialize. We cannot rehabilitate the entire housing stock solely through subsidies.
Communication as a key piece in achieving objectives <i>It seems that communication and even pedagogical efforts will be crucial if we want to trigger renovation and achieve long-term climate goals.</i> <i>How do you see, from your perspectives (administration, academia, and private sector), that communication should be approached with the different parties or clients?</i>	An important figure to work with is the property administrator, someone who can encourage and explain documents such as the iBRoad2EPC to the building owners. Spain has the opportunity to establish some form of obligation regarding Renovation Passports or a simplified version of iBRoad2EPC.

Question	Key conversation points and suggestions for improvement
<i>In this context, how do you believe tools like iBRoad2EPC can help overcome these barriers?</i>	
Utility and fit of iBRoad2EPC <i>What utility and fit do you think the tool could have? For example, i) relating or integrating it into an existing EPC software to introduce the step-by-step vision into official programs, ii) maintaining it as a complementary tool to EPCs and Passports, iii) becoming a simplified version of the passport promoted by the EPBD.</i>	iBRoad2EPC is based on data from the Spanish EPC, making it very useful to avoid duplicating information and overloading technicians with work; it serves both in the design phase and at the final phase for visualisation. It is essential that the wider public gives validity and quality to these certificates, which must stem from greater oversight by the administrations. The Renovation Passport is a key tool because it serves as a communication instrument, and it reaches a broader audience. This project has hit the nail on the head by reaching as many people as possible.

Table 7: Key conversation points raised during the Spanish Roundtable

Some additional questions posed by the participants were in relation to iBRoad2EPC's cost, its availability in Spanish, its application to already renovated buildings and its relationship with the Spanish building Logbook Libro del Edificio¹⁶. Overall, the stakeholders commented that iBRoad2EPC is a tool of great interest, and that it offers many possibilities and important features. The discussion then focused on how this tool could be made available in the market and what the subscription would be like for energy experts and building owners. It was identified that iBRoad2EPC can address the provisions of the recast EPBD regarding Renovation Passports and the need for the EPC to be a much more professional, complete document with a long-term vision, like the one provided by iBRoad2EPC.

Key takeaways - stakeholders views

- The stakeholders consider iBRoad2EPC very interesting and promising because of its flexible architecture and multiple features (long-term perspective, avoidance of lock-in effects, integration of legal requirements, database of energy upgrade measures, etc.). They highlighted that it goes beyond simply proposing specific improvement measures, as it incorporates both the property owner's desires and regulatory requirements.
- The stakeholders proposed that the online Assistant should allow for the addition of improvement measures beyond the pre-established list/database of renovation measures.
- It is not clear yet how iBRoad2EPC could be introduced in the Spanish market and how much it could cost for building owners.
- iBRoad2EPC can address the recast EPBD provisions on Renovation Passports and also the need for an upgraded, more professional and complete Spanish EPC with a long-term vision. It seems like the moment for real change in the sector has arrived, driven by new regulations and tools like iBRoad2EPC.
- They expressed the opinion that the Renovation Passport that Spain will have in the near future can very well be iBRoad2EPC or something extremely similar, simple, encompassing a lot of information while remaining understandable.

¹⁶ <https://librodeledificio.com/>

CONCLUSIONS AND RECOMMENDATIONS

The pilot countries' national Roundtables for the assessment of iBRoad2EPC's integration potential yielded important results on the barriers and facilitators for future implementation of the tool. A combined total of more than 250 participants provided insights across the 6 pilot countries and overall agreed that the iBRoad2EPC concept, methodology and tool presents great value both for energy experts and building owners. Overall, the iBRoad2EPC concept, methodology and features received very positive feedback from stakeholders, with its strongest points being the modular and flexible nature of its architecture, the ease of use for energy experts through the measures database and pre-filled text blocks, the well-designed graphics of its interface and outputs, and the multiple approaches for technical adaptation (API, XML and spreadsheet). It is identified as a suitable Renovation Passport to fulfil the 2024 EPBD provisions, and authorities are generally open to test it in combination with current tools, subsidy schemes and other national initiatives regarding energy efficiency.

In countries with a more advanced EPC framework, such as Portugal, new perspectives and links with existing successful tools and platforms are needed to ensure iBRoad2EPC is future-proof. The simplified approach and pre-filled text descriptions of iBRoad2EPC play a very important role in Bulgaria, where the complex methodology for building certification requires a high degree of effort from energy experts and translates to high costs for building owners. There is willingness of authorities to collaborate with iBRoad2EPC for the improvement of energy efficiency schemes (Bulgaria, Greece, Poland), the integration with existing or planned databases and tools (Greece, Portugal, Romania) and the national transposition of the revised EPBD (Portugal, Romania, Spain).

Future actions should focus on the alignment of iBRoad2EPC with EPBD transposition requirements in each country, finalization of automation and interconnections with third-party software, platforms and databases, as well as necessary legal, financial and regulative amendments to ensure adaptation in the country related procedures and schemes, as described in the priorities and actions identified in the national action plans included in the report "Public authorities views on the integration potential".

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101033781

