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Identifying the potential for EU-wide convergence of EPC schemes through a comparison of the existing and experimental enhanced EPC schemes

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ABSTRACT

To achieve the EU's energy efficiency targets, both the rate of building energy renovation and its depth, i.e., the amount of energy savings post renovation need to be improved. QualDeEPC, funded under the EU's Horizon 2020 programme, aims to develop high-quality energy performance assessment and certification in Europe that accelerates deep energy renovation. Following an EU-wide review of existing EPC schemes, and extensive stakeholder discussions in the seven partner countries, QualDeEPC developed an enhanced EPC scheme by improving seven elements of existing EPC schemes and tested their applicability and convergence potential for their EU-wide uptake. For testing the priorities on renovation recommendations and user-friendliness in the enhanced EPC, 98 pilot buildings were selected from seven partner countries. For all the pilot buildings, standard EPCs were prepared as per current national practices, and enhanced EPCs were prepared using the enhanced EPC scheme. Three further priorities – Online tool, Deep Renovation Network Platforms, and Advertisement Guidelines – were tested by means of a questionnaire to building owners and other stakeholders. The results show significant potential for improvement in the existing EPCs and convergence between various member states. In most countries, the number of recommendations and their ambition increased in the enhanced EPCs that provide a clear list of options, and almost 50% of energy savings potential were suggested in the enhanced EPCs. The building representatives found a proposed feature called 'traffic light system' that classifies the efficiency of building envelope elements and technical systems, and the information on energy and cost savings to be helpful. Key barriers for EU-wide convergence include the differences between the minimum legal requirements for presenting the recommendations, and the inputs, outputs and calculation procedure in the national calculation tools that make it difficult to present comparable information between various countries.

Introduction

To achieve the EU's energy efficiency targets, it is essential to improve the energy efficiency of existing buildings through deep energy renovation. Both the rate of energy renovation and its depth, i.e., the amount of energy savings during a renovation, need to be improved. Energy Performance Certificates (EPCs) are key to make energy efficiency measures transparent for the building market and to promote the energy efficiency of buildings through renovation. The revision of the Energy Performance of Buildings Directive (EPBD) is seen as a pre-condition to meet the Renovation Wave objectives and to reach a highly energy efficient and decarbonized building stock by 2050 (European Commission, 2020). One focus of the current revision of the EPBD is therefore the improvement of EPCs.

QualDeEPC, funded under European Union's Horizon 2020 research and innovation programme, aims to develop high-quality energy performance assessment and certification in Europe that accelerates deep energy renovation (QualDeEPC, 2021). The project has national partners from Bulgaria, Greece, Germany, Hungary,

Latvia, Spain and Sweden. Following an EU-wide review of existing EPC schemes, and extensive stakeholder discussions in the seven partner countries, QualDeEPC found that EPCs and EPC schemes need to be enhanced particularly in the following three ways:

1. Establish a close link between EPCs and deep energy renovation
2. Improve the quality of EPC schemes, i.e., both the EPCs and their data, and the processes of assessment, certification, verification
3. Improve cross-EU convergence of EPC schemes.

A detailed analysis of the EPC schemes in the partner countries and the EU was conducted (Gokarakonda, Venjakob, et al., 2020) and gaps, shortcomings (Gokarakonda, Thomas, et al., 2020), and best practices (Kostova, Gokarakonda, et al., 2020) were identified, and also based on the national stakeholder workshops, QualDeEPC identified seven priorities (Table 1) for improvement in the proposed enhanced EPC scheme (Kostova, Thomas, et al., 2020; Thomas et al., 2021). The improvements include improved renovation recommendations consistent with deep energy renovation, high user-friendliness through an improved EPC template, mandatory regular training or examinations for EPC assessors, and four other measures to facilitate better implementation and compliance by Member States and market actors.

Table 1. Seven priorities for improvement in the proposed enhanced EPC scheme

A.	Improving the recommendations for renovation, which are provided on the EPCs, towards deep energy renovation.
B.	An online tool for comparing EPC recommendations with deep energy renovation recommendations.
C.	Creating Deep Renovation Network Platforms (One-Stop Shops plus networking and joint communication of supply-side actors).
D.	Regular mandatory EPC assessor training (on assessment and renovation recommendations) required for certification/ accreditation and registry.
E.	Achieving a high user-friendliness of the EPC.
F.	Mandatory or at least voluntary advertising guidelines for EPCs.
G.	Improving compliance with the mandatory use of EPCs in real estate advertisements.

The seven priorities have been further developed in the course of the project and the preliminary results of the enhanced EPC were summarised in a Green Paper (Veselá et al., 2020). A second round of national workshops was organized, where the results from the Green Paper were discussed (Veselá, Thomas, & Pannier, 2021). Furthermore, the enhanced EPC scheme proposed in the Green Paper was tested for its applicability in a total of 98 pilot buildings from the seven QualDeEPC partner countries. The testing facilitated a cross national comparison of the enhanced EPC scheme. Then, the Green Paper was further advanced to the White Paper on good practices in EPC assessment, certification, and use. This includes the drafts for the enhanced EPC assessment scheme containing a template of the enhanced energy performance certificate of four pages and the concept for the Deep Renovation Network Platforms as well as for the tools. All of this was the basis for developing the national adaption of the enhanced EPC scheme and dialogue activities (Korma & Lampropoulou, 2022; Salve & Thomas, 2022) and the conclusive policy recommendations (Thomas & Venjakob, 2022).

This paper presents the process and results of testing the enhanced EPC scheme, along with relevant information from the pilot cases, such as the stakeholder feedback, with particular focus on similarities and differences between the QualDeEPC partner countries to demonstrate the convergence potential of enhanced EPCs for their EU-wide uptake.

Methodology

In total, 98 pilot buildings were selected from all QualDeEPC partner countries (Latvia -15; Greece -12; Bulgaria - 8; Sweden – 11; Spain – 15; Germany – 20; Hungary – 17) based on the following criteria (Žogla, 2021):

- Commitment – _pilot cases stakeholders have to commit to complete a feedback questionnaire on the assessment and certification scheme and to publish project data (confidentiality issues are considered)
- Availability – _of input data (energy consumption data, technical drawings, information about building system, etc.)
- Coverage – _in general, the pilot cases cover different building uses and types in each target country (with different climates). For each country, a total of 10 to 15 buildings were to be selected for testing as pilot cases. Of these, 5 to 8 have to be residential buildings and 4 to 7 non-residential buildings (such as offices, education buildings, supermarkets and shopping centres).
- Interest - from public institutions/stakeholders and public visibility of the building.

Most pilot buildings were built between 1960 and 1980. Among them, 61 are residential buildings, of which 33 are multi-apartment buildings, 20 are single family or row buildings and eight are single apartments; and 37 are non- residential buildings, consisting of educational buildings, office buildings and other types of non-residential buildings. 50 pilot buildings already had existing EPCs. For pilot buildings without existing EPCs, standard EPCs (according to national practices) were prepared in the course of the testing process. Overall, for all of the pilot buildings, standard EPCs were prepared as per current national practice, and enhanced EPCs were prepared using the enhanced EPC scheme, as proposed in the Green Paper.

To test the suggested improvements, first, the enhanced EPC template was filled in (the first version of enhanced EPC template was developed in work package 3 of the project and translated to the national languages) for each building. While preparing the enhanced EPCs, partners or their subcontractors were advised to be ambitious with the renovation recommendations compared with the recommendations they would make in the standard EPCs. For this purpose, they were provided with some examples of ambitious recommendations in the enhanced EPC scheme (priority A). Then, the standard EPC and enhanced EPC were given to pilot building representatives and stakeholders for evluation and comparison.

Additionally, specific questionnaires on the enhanced EPC were presented to facility managers/building owners for their responses on the improvements related to the priorities – (E) user friendliness of the enhanced EPCs and usefulness of (B) online tool, (C) Deep Renovation Network Platforms, and (F) advertisement guidelines. Furthermore, the results from the pilot cases were presented to the stakeholders and discussed in a series of roundtable discussions in all QualDeEPC partner countries. The participants in the roundtable consisted of various stakeholders, including EPC issuers, policy makers, and building owners. Their feedback was collected, documenting the differences, experiences, and what worked well or not during the preparation of the enhanced EPC in comparison to the standard EPC.

For assessing the priorities A and E (see Table 1), the enhanced EPCs were compared to standard EPCs to identify changes and improvements, or lack thereof. In addition, responses to the questionnaires from the building owners were collected for priority E. Three priorities, B, C, and F, were tested by means of responses to the questionnaires from the building owners and feedback from the stakeholder roundtables. The two remaining priorities, D and G were beyond the scope of testing. Furthermore, based on this information, the theoretical potential for EU-wide convergence (i.e., adaptation and adoption in a coherent manner in most or all EU Member States) for all the priorities was discussed.

Results and discussion

In general, the partners/consultants did not report any major difficulties in developing the enhanced EPCs for the pilot buildings. Minor difficulties in developing the enhanced EPCs are mostly related to the information that is required in the enhanced EPCs but is not present in the standard EPC. However, such difficulty is unavoidable when changes to the existing system are suggested. Furthermore, it appears that these difficulties can be tackled by providing prior guidance to the EPC issuers on filling in the enhanced EPCs and the energy efficiency recommendations towards deep energy renovation.

Key results from testing of the pilot buildings are presented for each of the five priorities in the following subsections. More details can be found in (Gokarakonda et al., 2022; Žogla & Gokarakonda, 2022).

Priority A. Improving the recommendations for renovation towards deep energy renovation

QualDeEPC developed a set of more energy-efficient renovation recommendations to guide the EPC assessors towards deep energy renovation (Veselá, Thomas, et al., 2021).

Basis for recommendations. The enhanced EPC presents recommendations in two categories - first, improvements in the building envelope, and second, improvements in technical (and renewable energy) systems. Furthermore, a description of useful combination of recommendations and their stepwise implementation, 'renovation recommendations – renovation concepts' are presented in two separate boxes. The first box contains recommendations that are included in the 'Main Option', which lists a set of cost-effective recommendations (i.e., cost-effective at least in case of major renovation scheduled anyway). The second box lists further recommendations that are not included in the Main Option e.g. due to high investment cost and long payback period, but maybe be feasible if further funding is available, e.g., under improved national incentive programmes.

The information in both these boxes, together with individual recommendations for building components and technical systems, should provide a roadmap towards nZEB. Moreover, a separate box presents 'Further information' that provides information on energy performance certification, use of EPCs and renovations to improve energy performance including financial assistance programmes. The following table (Table 2) shows the calculation methodology and basis for providing recommendations in standard and enhanced EPCs. However, a weakness of the testing was that it was not clear to all partners that assessors should use the ambitious renovation recommendations provided by QualDeEPC when filling in the enhanced EPCs, so not all of the partners or assessors they subcontracted did use these recommendations (see Table 2). Therefore, potential savings reported in next sub-section may become even higher in some countries, if the EPC form is used in connection with QualDeEPC's enhanced renovation recommendations.

Table 2. Basis for recommendations in standard and enhanced EPCs

QualDeEPC partner country	Calculation tool	Basis for recommendations that are included in the standard EPC	Basis for recommendations that are included in the main option in the enhanced EPC
Bulgaria	Official software of the Sustainable Energy Development Agency (SEDA), but it is not a mandatory one, the assessors can use any type of calculation tool as long as it complies with the approved calculation methodology of Ordinance No 7 "Energy efficiency in buildings"	As per the national regulations and legislations of Bulgaria for energy efficiency in buildings	As per the national regulations and legislations of Bulgaria for energy efficiency in buildings
Greece	National official software tool TEE-KENAK	Based on the requirements set out in the national 'Regulation for the Energy Performance of Buildings', as amended in 2017	Based on the requirements set out in the national 'Regulation for the Energy Performance of Buildings' and further enriched in terms of number of recommendations, towards deep energy renovation
Germany	Calculations are based on DIN V 18599 or a combination of DIN V 4108-06 and DIN V 4701-10 in case of residential buildings without cooling.	The EPC issuer can choose freely, but may consider current funding programs.	The EPC issuer can choose freely, but may consider current funding programs. The main aim should be to improve the energy rating.

Hungary	*Winwatt* commercial tool was used for the calculations, which is based on the 7/2006 (24 May) TNM decree "Methodology for calculation and requirements on energy performance of buildings"	According to existing approach and energy efficiency measures for full building renovation in Hungary	According to new approach proposed by the enhanced EPC template. It is in accordance with a proposed enhanced methodology to revise 7/2006 (24 May) TNM decree.
Latvia	Calculation tool (based in MS Excel) developed by energy assessor (who made the EPC for pilot buildings) according to National regulation No. 348 "Methodology for calculating the Energy Performance of a Building"	According to existing approach and energy efficiency measures for full building renovation in Latvia	According to existing approach and energy efficiency measures for full building renovation in Latvia
Spain	Official software of CE3X	According to existing approach and energy efficiency measures for full building renovation in Spain	According to existing approach and energy efficiency measures for Deep energy renovation towards NZEB
Sweden	N/A	Cost-effective measures (what should be considered cost-effective, and what to consider in the profitability analysis, is not clearly defined)	Few additional measures compared to Standard EPC were added because of lack of guidance on what are considered as cost effective measures

Comparing the recommendations and their presentation between the enhanced and standard EPCs. The enhanced EPCs are compared with the standard EPCs to identify the missing information in the enhanced EPC. Of the 14 key features for presenting the recommendations in the enhanced EPCs, 10 features are identified as primary features that require extensive or exclusive input data and calculation procedure, from which other secondary features can be calculated/derived with minimum effort[1]. The results from 1) a comparison of the standard and enhanced EPCs by the QualDeEPC country partners, 2) questionnaires answered by pilot building representatives, and 3) stakeholder roundtable meetings indicate that while many features in the enhanced EPC are perceived to be a clear or partial improvement over the standard EPC, a few are better represented in standard EPCs. The feature related to presenting energy rating with a 'traffic light system' for recommendations is seen as an improvement in the majority of the partner countries, although this information is not present in any of their standard EPCs (Žogla & Gokarakonda, 2022).

What is important for stimulating deep energy renovation, enhanced EPCs show a significant increase compared to the standard EPCs in the mean number of renovation recommendations in Greece and Hungary; and some increase in Germany, Spain and Sweden. In Bulgaria and Latvia, where the standard EPC is already based on a thorough energy audit, there is no change in the already high number of recommendations between the standard and enhanced EPCs (see Figure 1A). Compared to the recommendations in the standard EPCs, the enhanced EPCs show a significantly higher potential for energy savings in Greece and Spain, and a low to marginal additional potential in Bulgaria and Sweden. In Bulgaria, the reason for this result seems to be that the standard EPC is already based on a thorough energy audit, and the EPC comes with detailed information on the recommendations. In Germany and Hungary, potential energy savings are not provided in the standard EPC, but the potential for energy savings in the enhanced EPC is quite high, in the range of 40 to 50 per cent on average (see Figure 1B). Overall, potential mean energy savings in the enhanced EPCs across all buildings exceed that of standard EPCs by 17.5%.

Feedback from stakeholder discussions. Overall, the recommendations and their presentation in the enhanced EPC are seen as a clear improvement over the standard EPCs. The 'main option', which combines a set of cost-effective recommendations, and the energy rating with a 'traffic light system' for individual building component and technical system wise recommendations are seen as clear improvements across the partner countries (Veselá, Thomas, Gokarakonda, et al., 2021, fig. 11).

[1] effort is calculated based on self-evaluation by the authors

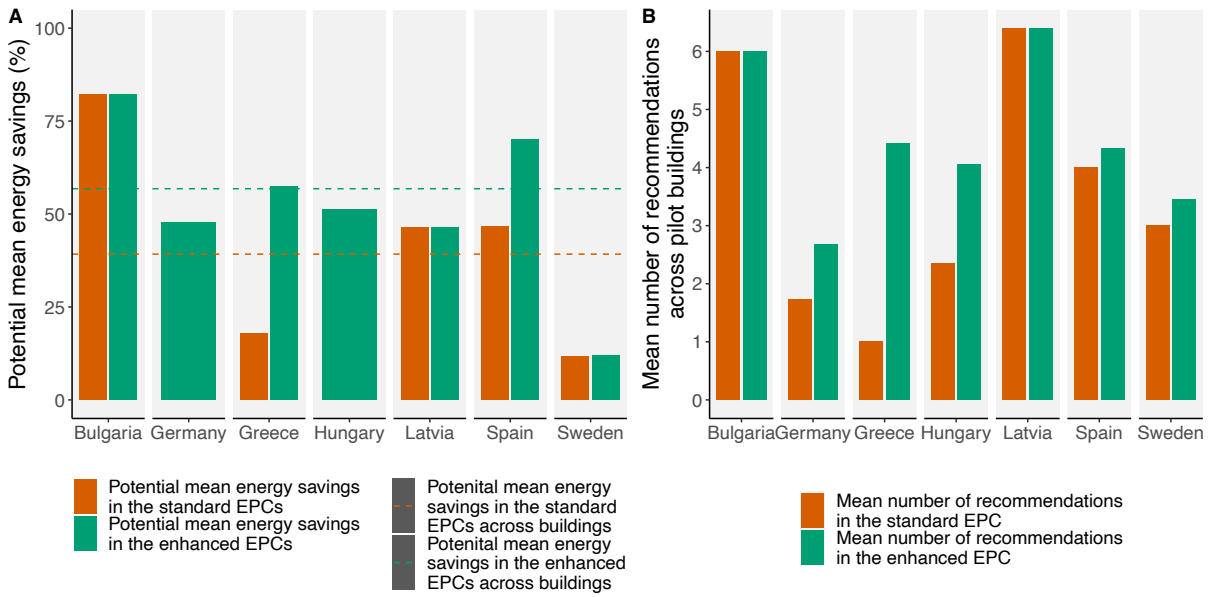

Figure 1: A) Mean number of recommendations provided in the enhanced and standard EPCs of pilot buildings; B) Potential mean energy savings (in percentage) in Enhanced EPCs. Source: Authors, based on (Gokarakonda et al., 2022)

The enhanced EPC clearly shows what energy efficiency measures should be implemented, and helps in decision-making to actually implement these measures by showing the full potential (energy saving potential) of these measures. Key challenges include features that are either missing from or better represented in some of the standard EPCs, including lack of CO_2 emission reductions for the main option, lack of energy savings by end-use and fuel source, and a way to convert this information into monetary terms, lack of information on capital cost investment for component and system wide recommendations, lack of guidance to EPC assessors for providing the recommendations and traffic light system, and cost and payback information for individual recommendations.

Potential for convergence. Compared to the renovation recommendations in most standard EPCs that usually only meet minimum legal requirements, the recommendations in enhanced EPCs are proposed to be consistent with, and guide towards 'deep energy renovation'. In all pilot buildings, the recommendations and their presentation in the enhanced EPCs were compared with the standard EPCs to identify changes and improvements, or lack thereof. Overall, the enhanced EPC presents many features regarding the renovation recommendations that are not usually present in standard EPCs. Out of 10 primary features, four have high, two have medium and four have low potential for convergence. Therefore, the overall potential for convergence of recommendations for renovation can be rated as medium.

Priority B. An online tool for comparing EPC recommendations with deep energy renovation recommendations

QualDeEPC developed a concept for a simple online calculation tool that building owners could use for estimating the potential energy efficiency measures and resulting energy savings in buildings, e.g., to better inform themselves prior to consulting an energy consultant or an EPC issuer (Veselá, Thomas, et al., 2021).

Responses to the questionnaires from the building owners. Building representatives (owners) were provided with a structured questionnaire regarding the tool itself and the information contained in such a tool. The question to the building representatives was: "Would you like to receive the following information from such a tool?" and the responses were recorded as 'yes' or 'not interested'. The list of questions and the results of the

responses are shown in Figure 2. Most questions received an average rate of positive reviews of above 75%. Across countries, building owners are interested in understanding the total costs for renovation, simple payback period, energy cost savings, and improvement in energy class, if the renovation recommendations are implemented. Comparatively, CO_2 emissions savings and economic gains, which are expressed in accurate but less understood metrics, such as net present value received the lowest interest, although it is still above 60%.

Feedback from stakeholder discussions. Overall, the online tool received wide acceptance from the stakeholders. On a national level, these platforms should be operated by the energy agencies, which will give the possibility to consult them not only online, but also physically and receive the required support from them. The cost related information is perceived as unreliable due to the dynamically fluctuating market environment. However, this could be overcome by annually updating the cost database. Instead of a stand-alone online tool, a few participants proposed that this should be part of the DRNPs (see priority C.).

Potential for convergence. The potential for convergence for such an online tool is high, as can be seen from the scores in Figure 2. Most stakeholders have expressed interest in the information provided in such an online tool and in many of its features, suggesting that stakeholders in most countries have similar needs. Some member states already have such tools, sometimes more than one, others don't. Implementing it in more countries will increase the potential for convergence.

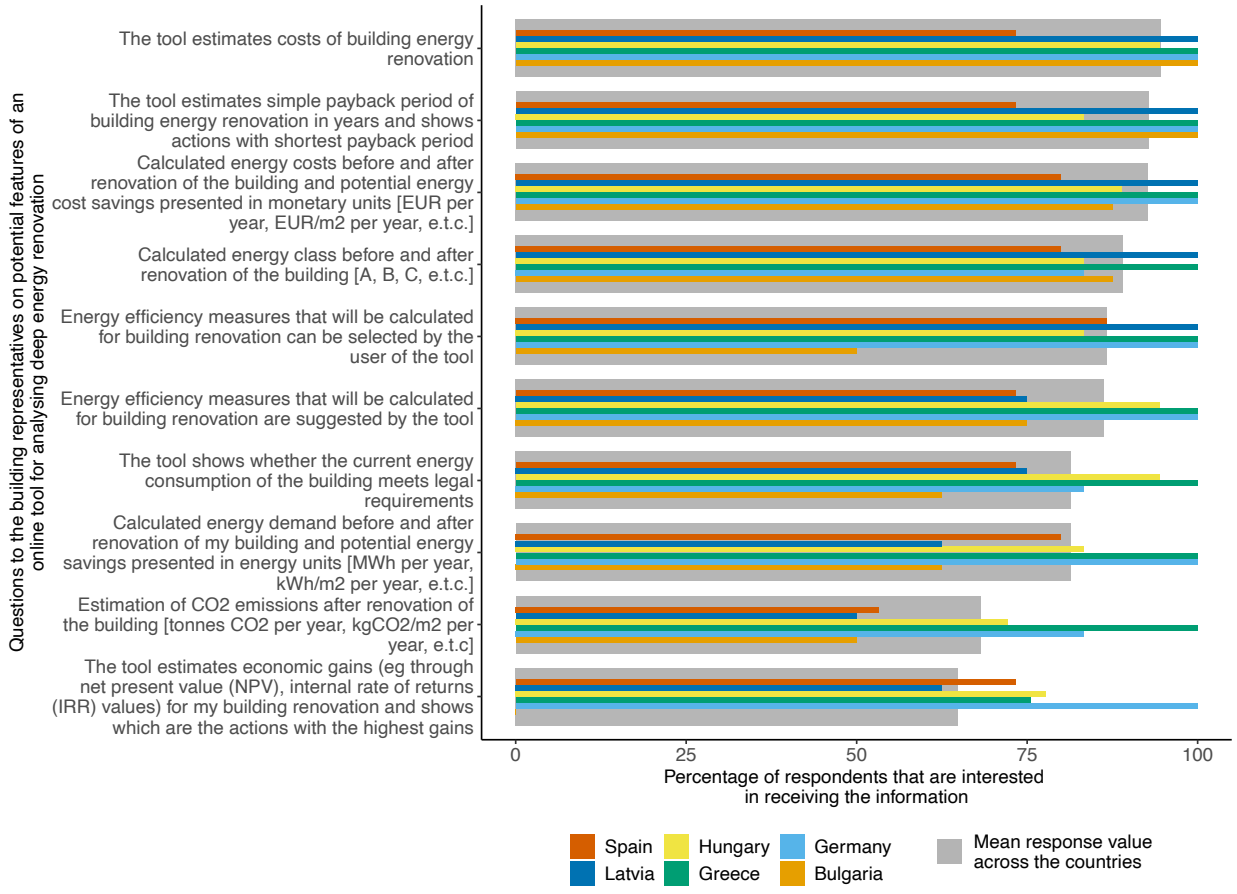

Figure 2. Feedback from building representatives on potential features of an online tool for analysing deep energy renovation. Note: Responses from Sweden are only in the form of descriptive feedback and the filled in questionnaires are unavailable.

Priority C. Creating Deep Renovation Network Platforms

QualDeEPC proposes a Deep Renovation Network Platform (DNRP) that provides all relevant information on EPCs, building renovation and building energy efficiency in one place (Veselá, Thomas, et al., 2021). It can be seen as a One-Stop Shop on energy renovation for building owners plus networking and joint communication of supply-side actors.

Responses to the questionnaires from the building owners. The question asked to the building representatives was whether they would use a type of information or not. The list of questions and the results of the responses are shown in Figure 3. Most questions received an average response ("I would use it") of above 75%. Building owners found these as the most interesting features:

- Finding general information on costs of and financing opportunities for deep renovation;
- Potential for energy and cost savings; building components, building services, renewable energy systems that are required for deep renovation;
- A platform for finding and receiving offers/quotes from energy efficient experts, contractors, technicians, and vendors to implement recommendations.

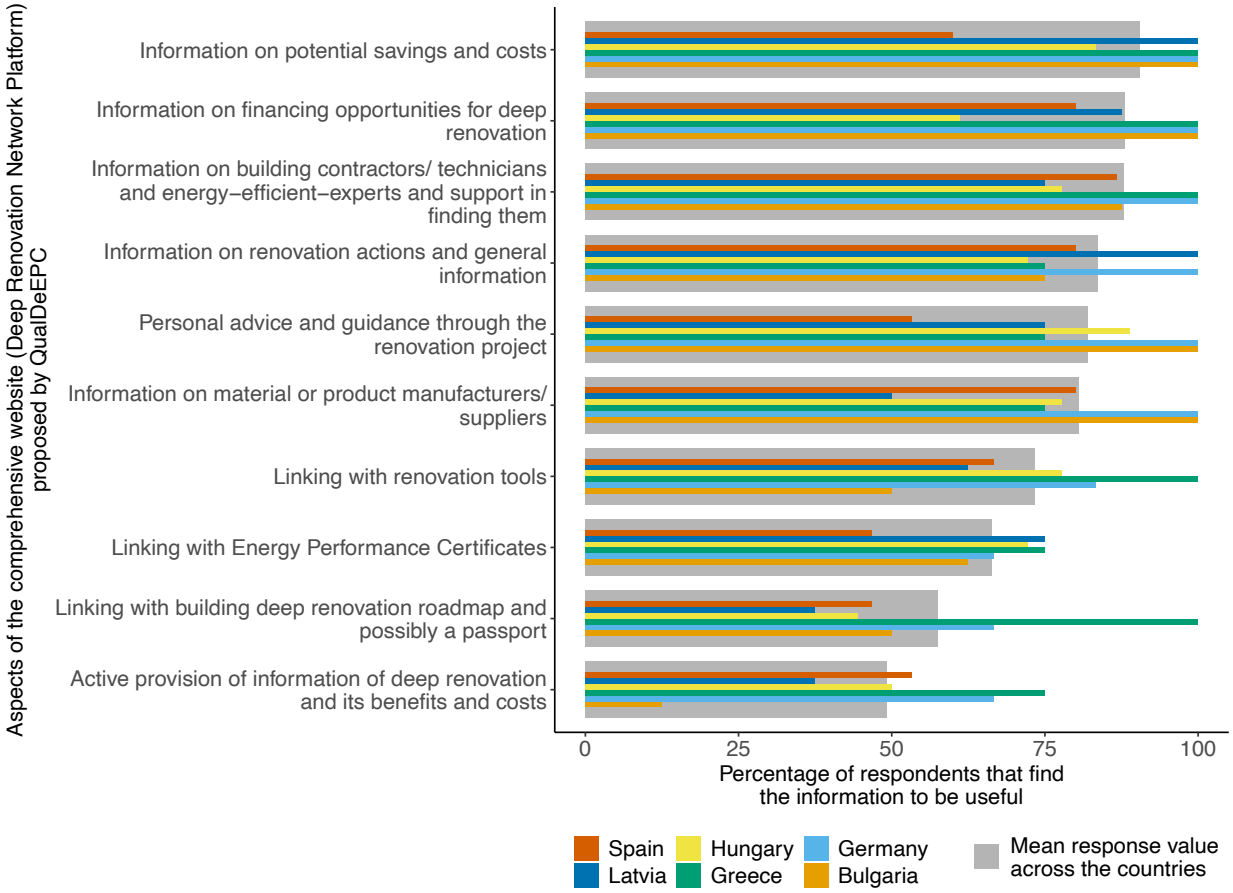

Figure 3. Feedback from building representatives on potential features of a deep renovation network platform. Note: Responses from Sweden are only in the form of descriptive feedback and the filled in questionnaires are unavailable.

Feedback from stakeholder discussions. For both EPC certifiers and end users, providing as much relevant information as possible would be useful. A few suggestions that could maximise the impact of the platform include:

- A good definition of the recommendations for improvement measures, and characteristics of the construction systems and equipment (prices, transmittances, or the relevant data according to the improvement);
- Featuring on the platform the catalogues with ideas and standard equipment to guide the EPC certifier;
- Investment planning for building owners;
- Include national case studies/best practices with technical and financial information;
- Link to a database of certified technicians.

Potential for convergence. The potential for convergence for such an online tool is high. Most stakeholders have expressed interest in the information provided in a Deep Renovation Network Platform and in many of its features, suggesting that stakeholders in most countries have similar needs.

Priority E. Achieving a high user-friendliness of the EPC

QualDeEPC developed an enhanced general template for the EPC form as a policy proposal (Thomas et al., 2021; Veselá, Thomas, Gokarakonda, et al., 2021). As stated above, this was used to issue as an experimental enhanced EPC for all pilot buildings. Building representatives and stakeholders were then sent a questionnaire about whether they think the enhanced EPC is more user-friendly than the national standard EPC, and regarding which features.

Feedback from building representatives. To evaluate the user friendliness of the enhanced EPC template, a questionnaire (containing 17 questions on user friendliness of EPCs) was sent out to pilot building representatives together with the standard and enhanced EPC of their pilot buildings (please refer to Žogla & Gokarakonda, 2022 for details on the questionnaire and scores). They were asked to answer these questions for both standard EPC and enhanced EPC in a scale of 1 (agree) to 5 (disagree). In total 69 questionnaires were filled in and considered for this analysis. Overall, the enhanced EPC template received a 71.4% score (averaged out by 7 countries) and 72.7% score (averaged out by 69 respondents), while the user friendliness of the standard EPC received 62.2% (averaged out by 7 countries) and 60.6% (averaged out by 69 respondents), indicating an improvement in the enhanced EPC compared with the standard EPC by 10.65%. The enhanced EPC scored high (and higher than the standard EPC) in all countries for most of the statements related to renovation and renovation recommendations. However, an exception is Latvia, which already had a very good presentation. In Germany and Latvia, the standard EPC has an additional scale of comparison to other buildings, but the enhanced EPC does not, so the enhanced EPC scores worse for the questions relating to those features.

Feedback from stakeholder discussions. The enhanced EPC has been considered an improvement over the standard EPCs in the way it presents key information about the building energy performance. The energy rating of the existing building envelope and technical systems with a ‘traffic light system’ was perceived as a key improvement. Key challenges include unclear identification of renewable energy fraction, energy consumption by end-use and fuel source, and other country specific requirements. Most of these challenges could be overcome through national adaptation.

Comparing the user-friendliness between the enhanced and standard EPCs. Based on the survey of building representatives and stakeholder discussion, the following features are perceived as clear changes and improvements in the enhanced EPCs by most partner countries (see Figure 4): scale of energy class; identification of new energy class and annual energy savings after implementing the recommendations in the main option; energy rating of existing building elements and renovation recommendations with traffic light system; and useful combinations of recommendations for staged deep renovation. However, in Hungary and Latvia, most of these features are presented in the Annex, rather than on the main EPC, where they are prominently visible. Some standard EPCs present more detail on energy use in the existing building than the enhanced EPC. However, this

can be easily addressed. Furthermore, Figure 5 presents the key features of user-friendliness that are proposed in the enhanced EPCs but may be present or absent in the standard EPCs.

Potential for convergence. In general, the results from the questionnaire for building representatives and the discussions with stakeholders showed that the enhanced EPC template proposed by QualDeEPC has high potential for convergence between EU Member States, for its four pages and innovative user-friendly presentation and features. Although most of the proposed features in the enhanced EPCs already exist in the standard EPCs, they are presented in a more user-friendly way in the enhanced template; and where they are non-existent, e.g., in countries that have had EPCs with one or two pages only, they are perceived as at least a partial improvement. If a Member State has different legal requirements or thinks more information is still important and necessary to inform building owners and users e.g., on the current energy status of the building, this can be added in one or more additional pages to the enhanced EPC. Space for important simple additional check boxes may also be found on the four pages of the enhanced EPC template. The results of the testing also showed that more guidance for EPC assessors is needed, e.g., on how to select recommendations based on cost-effectiveness, how to assess their energy rating and cost-effectiveness, and how to combine them to the main option.

Priority F. Voluntary/mandatory advertising guidelines for EPCs

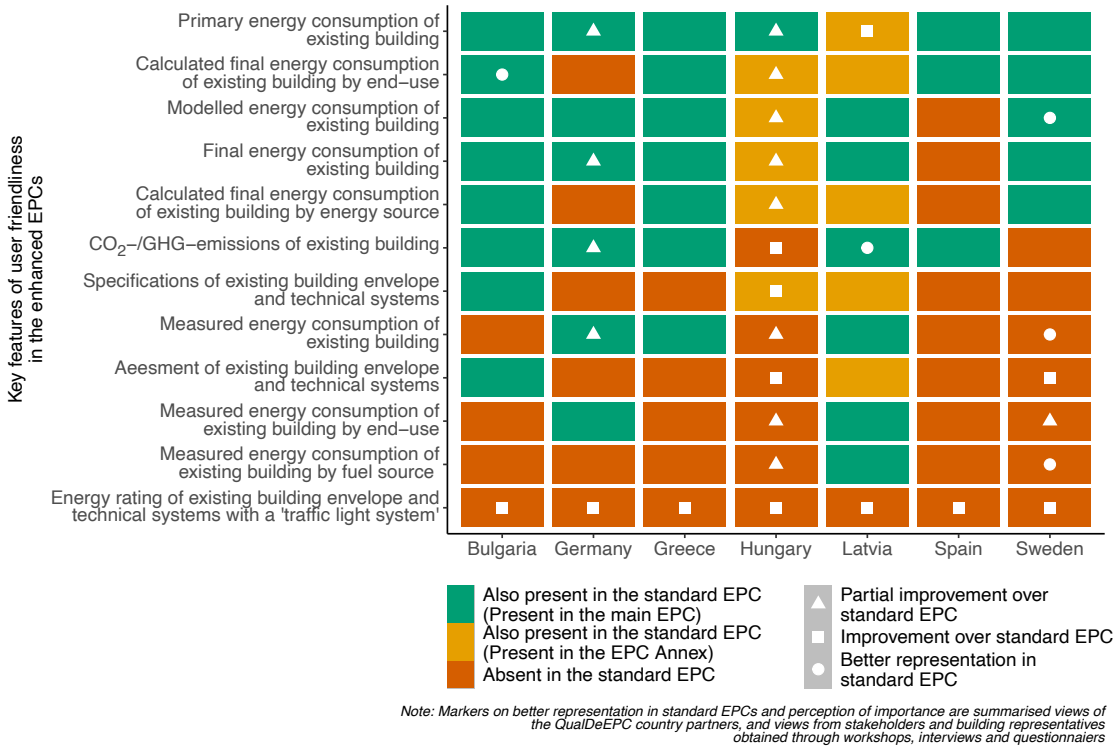

Figure 4: Comparison of key features of user friendliness between enhanced and standard EPCs

According to the EPBD, it is mandatory to show the energy class and energy data from the building's EPC in advertisements when selling or offering a building for rent, although compliance with this regulation may often be low. QualDeEPC has, therefore, proposed that Member States offer advertisement guidelines to ease and increase compliance with this requirement. This is following the example of Sweden, where there is practical

guidance on how to comply with the regulation that efficiency class, scale of energy consumption, and CO_2 emissions should be shown at least (Veselá, Thomas, et al., 2021).

Responses to the questionnaires from the building owners. A question regarding this proposal was also included in the questionnaire to building representatives in six of the seven EU Member States represented in the QualDeEPC project, but not in Sweden, where such guidelines already exist. A number of features were presented under the general question: "Which guidance would be useful for you to comply with this regulation when selling/letting a building?". The list of questions and the results of the responses are shown in Figure 5. Among the aspects that received most interest are ways to find out the current energy demand/consumption and energy costs of the building, energy class and date of issue of the EPC.

Feedback from stakeholder discussions. Stakeholders broadly agreed that in general, control mechanisms to monitor the energy class and energy data from the building's EPC in advertisements need to be strengthened. The provision of guidelines on "how to" find, present, or calculate different values, is a task that also the EPC assessors should undertake when handing in the EPC to the building owner/representative. Furthermore, stakeholders supported the proposal to provide general/indicative guidelines for building owners-users related to the legal requirements when advertising to media. In Sweden, most stakeholders find the guidelines to be very useful for the compliance.

Potential for convergence. The potential for convergence is high for the existence of such guidelines, and moderate for their content (depends on the legal requirements for which information to show, which may differ between Member States).

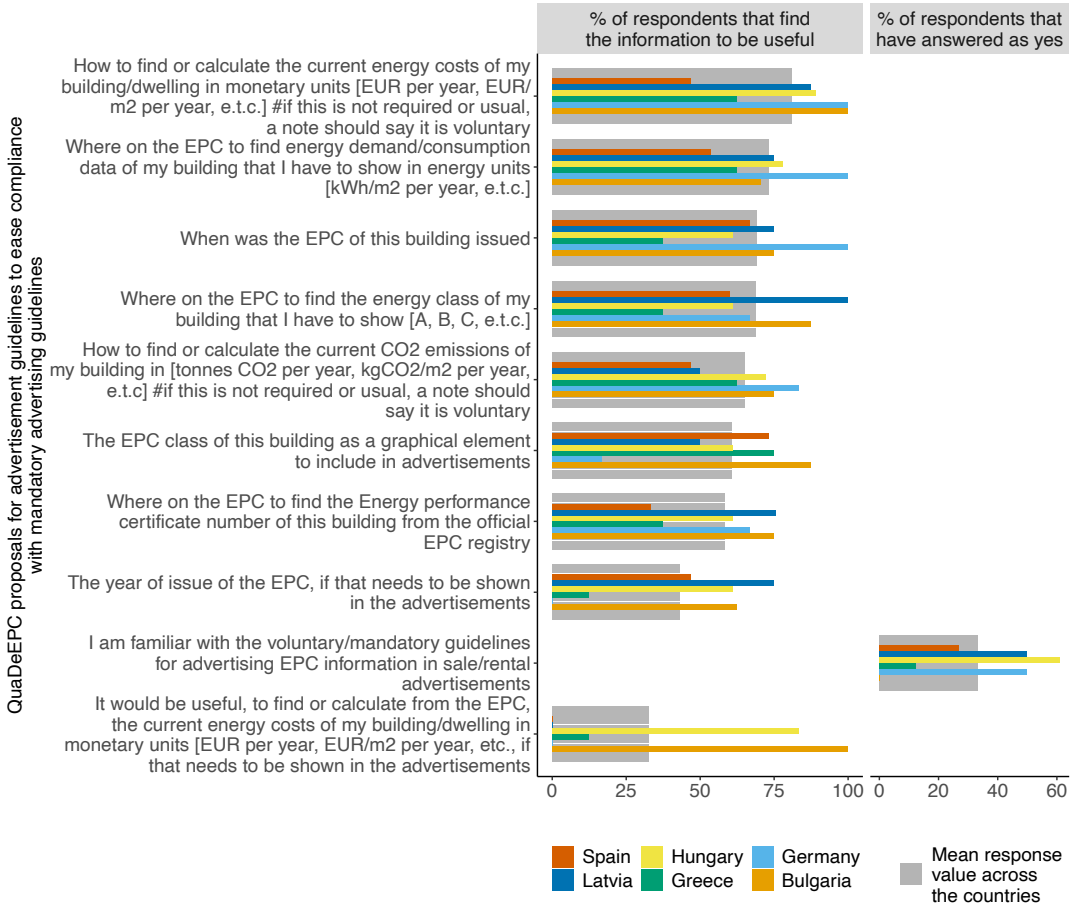

Figure 5: Feedback from building representatives on potential content of voluntary/mandatory advertising guidelines for EPCs

Conclusions

Various aspects of Energy performance certificates (EPCs) differ between various Member States. However, there exists a high potential for convergence of EPCs between them. Evidence from testing the enhanced EPC scheme developed by QualDeEPC clearly shows that improved renovation recommendations – both in number and in ambition regarding the energy savings that can be achieved – and their presentation on the EPCs in a user-friendly manner is an important first step towards deep energy renovation. This should be accompanied by tools such as an online tool to calculate energy savings post deep energy renovation. An eco-system for deep energy renovation should be fostered e.g., with the deep renovation network platform.

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