



## 2nd REBs conclusion report

**Minutes of 2nd Set of Meetings of Northern, Western, Central, Southwestern  
and Southeastern Regional Exploitation Boards (REBs)**

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## OVERVIEW OF THE ePANACEA PROJECT

After 10 years of track record, the current EPCs schemes across the EU face several challenges which have led to not fully accomplish their initial objectives: lack of accuracy, a gap between theoretical and real consumption patterns, absence of proper protocols for inclusion of smart and novel technologies, little convergence across EU schemes, lack of trust in the market and very little user awareness related to energy efficiency.

The objective of the ePANACEA project is to develop a holistic methodology for energy performance assessment and certification of buildings that can overcome the above-mentioned challenges. The vision is ePANACEA becoming a relevant instrument in the European energy transition through the building sector. ePANACEA comprises the creation of a prototype (the Smart Energy Performance Assessment Platform) making use of the most advanced techniques in dynamic and automated simulation modelling, big data analysis and machine learning, inverse modelling or the estimation of potential energy savings and economic viability check.

A relevant part of the project is to have a fluent dialogue with European policy makers, certification bodies, end-users, and other stakeholders through two types of participatory actions: on the one hand a feedback loop with policy makers will be carried out through the so-called Regional Exploitation Boards (REBs) covering EU-27+Norway+UK, and the dialogue with the end-users will be established by means of specific thematic workshops. Thanks to these participatory actions we will ensure that ePANACEA approach is aligned with and meets the needs of national public bodies, end-users, and other stakeholders with a view to test the acceptance and to validate the methodology developed.

ePANACEA will demonstrate and validate reliability, accuracy, user-friendliness, and cost-effectiveness of the methodology through 15 case studies in 5 European countries.



## EXECUTIVE SUMMARY

The Regional Exploitation Boards (REBs) represent an important pillar of ePANACEA. The project aims to establish a fluent dialogue with different European stakeholders with special focus on national/regional policy makers and certification bodies, which are directly involved in the implementation of the different EPC schemes and are responsible for energy regulations development in their own regions/countries. Therefore, the REBs are composed of these important regional European stakeholders, as well as consumer associations, building products manufacture associations, professional associations, etc. The dialogue is moderated by the ePANACEA project partners. This document summarizes the content of the second five Regional Exploitation Board meetings which took place in November and December 2021. In total, 36 different and highly relevant institutions from 20 different countries primarily discussed the two topics of insights and recommendations from end-user interviews and convergence and prioritisation of key indicators for EPCs during the five online sessions.

The second round of Regional Exploitation Board meetings was divided into three sections, supplemented by two parts in which the "Progress of ePANACEA " and "Summary, conclusions and next steps" were elaborated. The first section was planned as an "Introduction", with the aim of getting all participants up to date on the Mural working system and answering simple questions with "post-its". Four questions were asked about ePANACEA REB meetings, satisfaction with the current energy performance certificates in one's own country, and two questions about visits to the ePANACEA website and the REB exclusive area.

In the following section, the "Insights and recommendations from end-user interviews and workshops from 6 countries" were presented, evaluated and later once more discussed. The insights and recommendations were summarised in four categories and the agreement or alternative opinions of the participants were asked for: "end-users' and other stakeholders' needs", "possible and suggested solutions", "criteria-set for an adequate EPC derived by user need assessment" and "expert feedback".

In the third section, the "Convergence and prioritisation of key indicators for EPC's" was discussed. For this purpose, two summary sheets were developed based on the input from stakeholders during the first REB meetings as elaborated in Deliverable 6.1. A general EPC front page, a summary sheet for all stakeholders (administration and end-user), as well as a second page, which is an administration-oriented EPC summary sheet, were developed. The contents of each were evaluated and discussed with the experts from the five REB meetings.

It is highlighted that this document provides an evaluation on different subjective opinions from several experts from different member states. The conclusions summarize valuable feedback for the upcoming project activities related to the ePANACEA methodology development.



# 1. INTRODUCTION

The **Regional Exploitation Boards (REBs)** represent an important pillar of ePANACEA. The project aims to establish a fluent dialogue with different European stakeholders with special focus on national/regional policy makers and certification bodies, which are directly involved in the implementation of the different EPC schemes and are responsible for energy regulations development in their own regions/countries. Therefore, the REBs are composed of these important regional European stakeholders, as well as consumer associations, building products manufacture associations, professional associations, etc. The dialogue is moderated by the ePANACEA project partners.

The REB members will be involved in the definition of the energy assessment methodology, in its validation and evaluation, and in supporting local dissemination actions. This feedback loop will allow ePANACEA to develop an upgraded EPC methodology, suitable for national requirements of the stakeholders.

The REBs are organised based on their geographical location. In total, there will be five REBs established, in order to cover all EU Member States (EU27+Norway+UK). The following

Figure 1 gives an overview on the five different REBs. Each REB is led by one ePANACEA project partner.

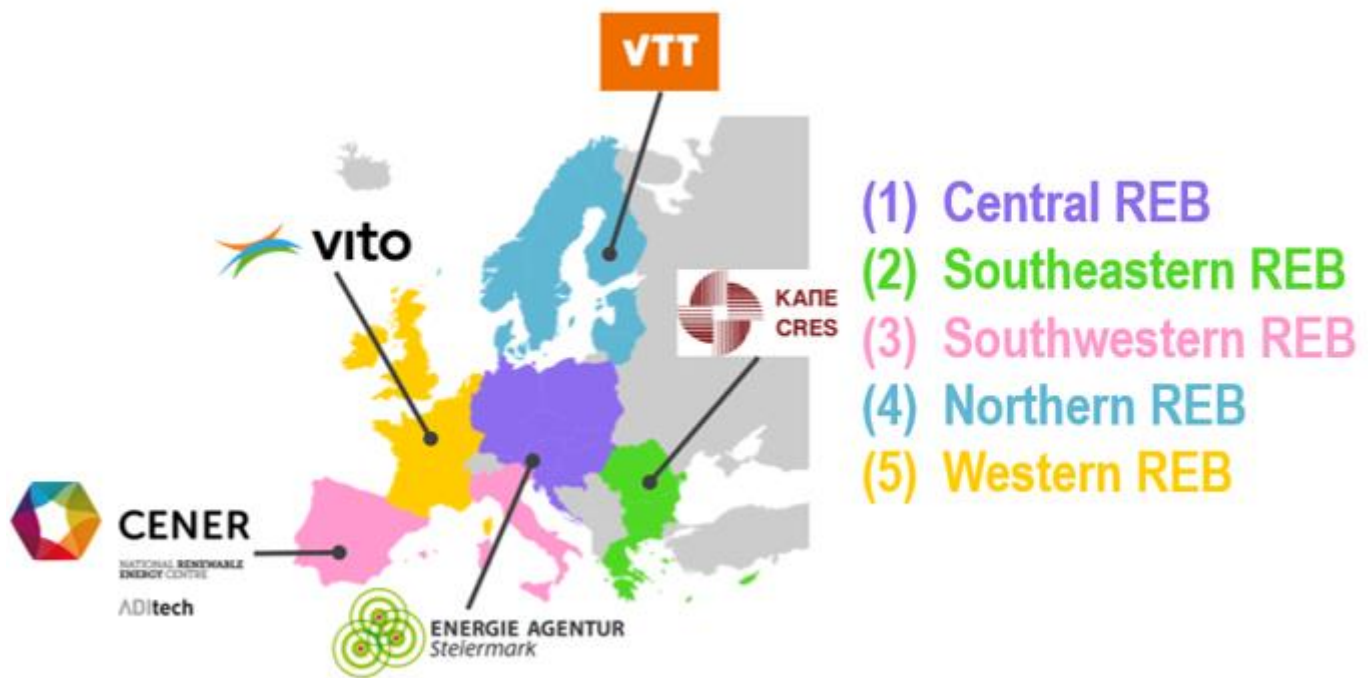


Figure 1: Overview on the REB structure

Each REB will meet three times during the project lifetime. The 2<sup>nd</sup> REB meetings took place in November and December 2021, as specified below:

- **Northern REB**, led by VTT (Technical Research Centre of Finland) **on 29th November 2021**
- **Central REB**, led by EASt (Energy Agency of Styria) **on 1st December 2021**
- **Western REB**, led by VITO (Vlaamse Instelling voor Technologisch Onderzoek N.V.) **on 8th December 2021**
- **Southwestern REB**, led by CENER (National Renewable Energy Centre of Spain) **on 13th December 2021**
- **Southeastern REB**, led by CRES (Center for Renewable Energy Sources) **on 13th December 2021**

The second round of Regional Exploitation Board meetings, as shown in Figure 2, was divided into three sections, supplemented by two parts in which the "Progress of ePANACEA " and "Summary, conclusions and next steps" were elaborated. The first section was planned as an "Introduction" (not discussed later on), with the aim of getting all participants up to date on the Mural



working system and answering simple questions with "post-its". Four questions were asked about ePANACEA REB meetings, satisfaction with the current energy performance certificates in one's own country, and two questions about visits to the ePANACEA website and the REB exclusive area.

## 2. MEETING OF THE CENTRAL REGIONAL EXPLOITATION BOARD

**1<sup>st</sup> December 2021** **10:00-12:00 CET**

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**Slightly updated AGENDA for TODAY**

- 1. 15 min** - Welcome and Introduction
- 2. 10 min** - Progress of ePANACEA
- 3. 40 min** - Insights and recommendations from end-user interviews and workshops from 6 countries
- 5 min** - Break
- 4. 40 min** - Convergence and prioritisation of key indicators for EPCs
- 5. 10 min** - Summary, conclusions and next steps





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Figure 2. Representative presentation of the agenda of the second Central REB meeting on 1 December 2021 organised and hosted by the project partner Energy Agency Styria.

In the following section, the "Insights and recommendations from end-user interviews and workshops from 6 countries", discussed in Section 3.1. , were presented, evaluated and later once more discussed. The insights and recommendations were summarised in four categories and the agreement or alternative opinions of the participants were asked for: "end-users' and other stakeholders' needs", "possible and suggested solutions", "criteria-set for an adequate EPC derived by user need assessment" and "expert feedback".

In the third part, see Section 3.2. , the "Convergence and prioritisation of key indicators for EPC's" was discussed. For this purpose, two summary sheets were developed based on the input from stakeholders during the first REB meetings as elaborated in Deliverable 6.1. A general EPC front page, a summary sheet for all stakeholders (administration and end-user), as well as a second page, which is an administration-oriented EPC summary sheet, were developed. The contents of each were evaluated and discussed with the experts from the five REB meetings.

It is highlighted that this document provides an evaluation on different subjective opinions from several experts from different member states. The conclusions summarize valuable feedback for the upcoming project activities related to the ePANACEA methodology development.



## 2. PARTICIPANTS OF THE 2<sup>ND</sup> REB MEETINGS

The following Table 1 and Figure 3: Overview on participants' structure among the five REB meetings give an overview of the participants of the five 2. REB meetings and their structure. In total, 36 different and highly relevant institutions from 20 different countries primarily discussed the two topics of insights and recommendations from end-user interviews and convergence and prioritisation of key indicators for EPCs during the five online sessions.

Table 1: Overview on participating REB institutions; \*Austrian partners participated in 3/5 meetings; Spanish in 2/5;

REB	Participating institutions (including project partners PPs)	Countries
Western REB	4 (1 PPs)	3
Southwestern REB	10 (3 PPs)	5
Central REB	10 (2 PPs)	6
Southeastern REB	8 (1 PPs)	3
Northern REB	7 (2 PPs)	5
<b>Total</b>	<b>39 (36 different)*</b>	<b>22 (20 different)*</b>

In terms of the fields of activity of the 30 participating external organisations, the following picture became apparent. Most of the participants (7 / 23%) were national or regional policy makers, and the same number of participants were not assigned to any category. 5 (17%) participants were certification bodies or professional associations, and 4 participating organisations were EPC experts or energy auditors. The smallest number of participating organisations could be assigned to the category of building products manufacture associations (2 / 7%).

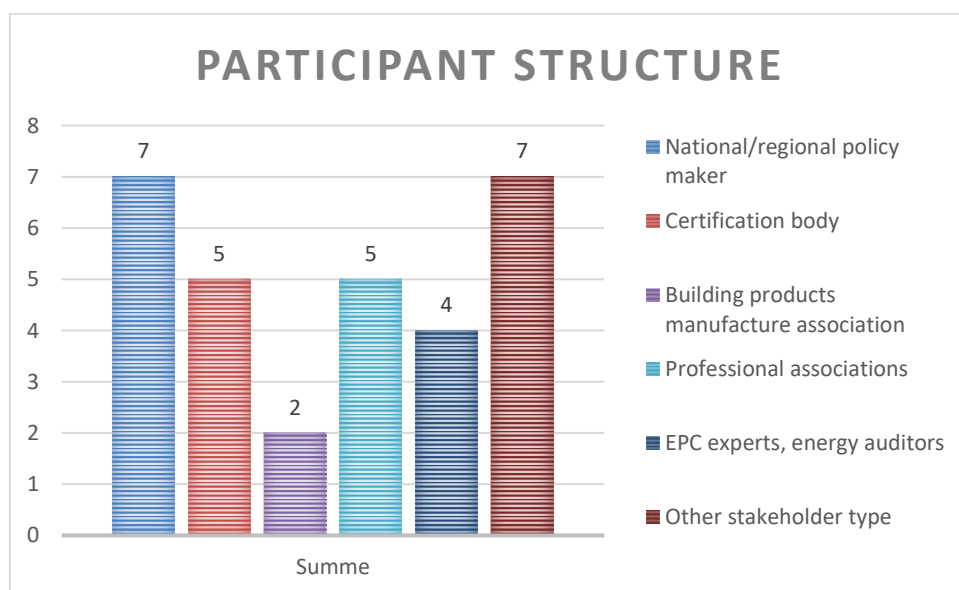


Figure 3: Overview on participants' structure among the five REB meetings



### 3. CONCLUSIONS OF THE FIVE REB MEETINGS

The 2<sup>nd</sup> meetings of the ePANACEA Regional Exploitation Boards (REBs) dealt with the following topics:

- Introduction to ePANACEA project, website and REB exclusive area and Mural (Not discussed later on)
- (1) Insights and recommendations from end-user interviews and workshops from 6 countries
- (2) Convergence and prioritization of key indicators for EPC's

which are presented in detail in the chapter in question. In addition, Chapter 4. presents a compact summary of the key results obtained. Some chosen statements from REB members, which were done by the meeting participants, are displayed in the Figure 4 below. The statements give an overview of the different perspectives and opinions of the REB members and show the broad diversity of the discussions.

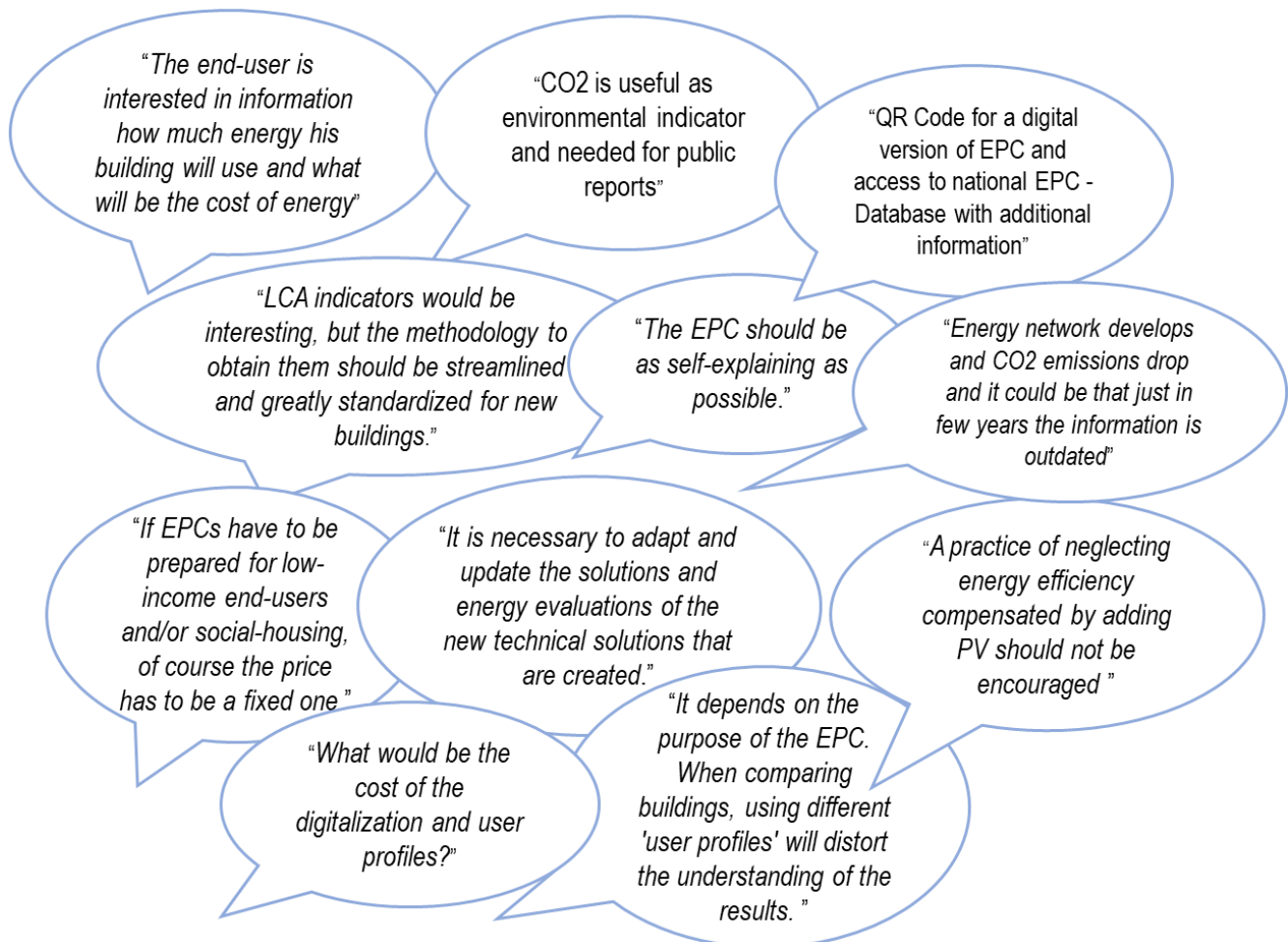


Figure 4: Overview on some chosen statements from REB members during the 2<sup>nd</sup> REB meetings



### 3.1. Insights and recommendations from end-user interviews and workshops from 6 countries

Within this part of the 2.REB meetings, the "Insights and recommendations from end-user interviews and workshops from 6 countries", were presented, evaluated and later once more discussed. The insights and recommendations were summarised in four categories and the agreement or alternative opinions of the participants were asked for: "end-users' and other stakeholders' needs", "possible and suggested solutions", "criteria-set for an adequate EPC derived by user need assessment" and "expert feedback".

#### 3.1.1. End-users' and other stakeholders' needs

The "end-users' and other stakeholders' needs" can in principle be divided into five different needs:

1. Information about real energy consumption and energy costs (tangible information)
2. Focus in individual recommendations
3. Additional indicators, e.g. life cycle indicators for building materials
4. Affordable prices for EPCs
5. Comparing quality of buildings

In the following sections, these five needs are presented, and some chosen statements are shown. It should be mentioned once more that:

*This document provides an evaluation on different subjective opinions from several experts from different member states. The conclusions summarize valuable feedback for the upcoming project activities related to the ePANACEA methodology development.*

##### 3.1.1.1. Information about real energy consumption and energy costs (tangible information)

Information about the real energy consumption related to the energy costs is an aim for 91% of all participants, only 9% voted against (see Figure 5). Dynamic energy costs make it hard to estimate costs – this argument is mentioned several times. Real energy must be metered and include user behaviour.

*The real energy and energy cost are related to user and actual energy price. [Poland]*

*Energy costs are variable on the market and in time. [Romania]*

*Yes it is relevant, since the EPC is the tool to provide information and transparency [Germany]*

*As Modular solutions would be good; additional information depending on end-user and stakeholder needs should be added [Ireland]*

■ yes ■ partially ■ no



Figure 5: Approval rate – Information about real energy consumption and energy costs



**3.1.1.2. Focus on individual recommendations (regarding renovation and everyday energy behaviour)**

More detailed recommendations are needed, as shown in Figure 6 and therefore requested by the participants. The reasons for renovation / investment should be transparent and defined in a clear step to step renovation roadmap.

*It should not only include low-cost recommendations [Germany]*

*Very relevant to the target of the EPCs. General recommendations could serve as an indication of areas to improve. [Portugal]*

*Prioritized individual recommendations already included in residential EPCs [Flanders]*

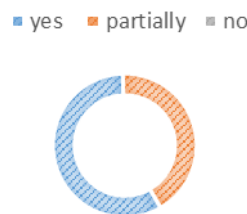


Figure 6: Approval rate – Focus on individual recommendations

**3.1.1.3. Additional indicators, e.g. life cycle indicators for building materials**

The participants generally support the statement that further indicators such as "life cycle indicators for building materials" are important, as shown in Figure 7. LCA indicators would be interesting, but the methodology to obtain them should be streamlined and greatly standardized for new buildings. In some countries, such as Austria, these life cycle indicators and a methodology for them are already available.

*In order to fulfil 2050 Goal [Poland] (Assumption: [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en))*

*LCA indicators would be interesting, but the methodology to obtain them should be streamlined and greatly standardized for new buildings. [Spain]*

*Not relevant for existing buildings (materials) [Finland]*

*Nowadays we can duly expect additional indicators/parameters to be evaluated, such as LCA, but also indoor air quality and comfort (e.g. from current certifications like LEED, BREAM, etc), SRI, LEVEL(S), other information from the Digital Building Logbook, digital twins, etc. [Italy]*

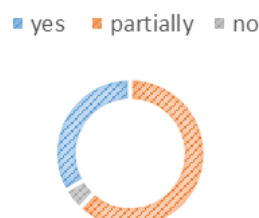


Figure 7: Approval rate – Additional indicators

#### 3.1.1.4. Affordable prices for EPCs

In several EU countries and even regions, EPCs are given at a relatively "low" price (80-150 €/piece) and are produced in a few hours (without the need for a site visit). The cost of producing an Energy Performance Certificate varies from country to country, region to region and depending on the assessor - €55 in the UK, €100-150 in Ireland and €200-300 in Flanders. As the EPC is mandatory, the price should therefore also be affordable, as approved by the participants (see Figure 8). On the contrary, a good price should mirror the expertise of the involved assessor for a well-performed analysis, while being relevant also for end-users (tenants, dwellings) to take the recommendations contained within into consideration.

*Add-ons: will people be willing to pay for this? [Flanders]*

*Prices should be reasonable but should not hinder the quality of information [Germany]*

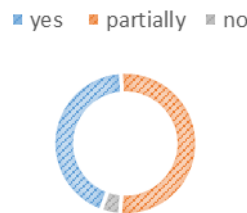


Figure 8: Approval rate – Affordable prices for EPCs

#### 3.1.1.5. Comparing quality of buildings

As it is the main goal of the EPC there is no vote against a reliable database for the administration (see Figure 9). It may be necessary in the future to adopt strategies for entire regions.

*It is necessary to adapt and update the solutions and energy evaluations of the new technical solutions that are created. [Spain]*

*Original purpose, needs to be kept in mind [Austria]*

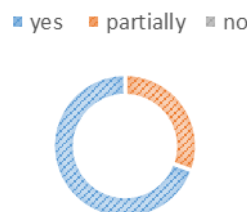


Figure 9: Approval rate – Comparing quality of buildings

### 3.1.2. Possible and suggested solutions

Concerning possible and suggested solutions, the participants of the 2. REB meetings was asked the following question:

**“What do you think about the possible solutions?”**

and related to this the following sub-questions:

- „Digital version of EPC“ as add-on with additional information on consumption data, costs, life cycle indicators etc.
- Customizable EPC through different user profiles (e.g. energy efficient user, comfortable user...)
- Splitting EPC in two versions (end-user oriented with consumption data, administration-oriented)



- Improvement of communication between end users and EPC issuers





As shown in Table 2, a high level of agreement on the benefits of a digital version of the EPC with additional information could be derived. There was a controversial discussion about the introduction of a customizable EPC based on different user profiles. Additionally, there were proposals to have three levels of users: energy efficient, standard condition, and comfort users on the one hand, and arguments that using different "user profiles" would distort the understanding of the results on the other.

No consensus was reached regarding comments on the division into two EPCs (end-user oriented vs. administration oriented). Some participants see the possibility of adapting the EPC to different needs and objectives, others are in favour of the official EPC being a single document. Opposing opinions are also expressed regarding communication with end users: A larger percentage of participants believe that there is a need to improve communication between EPC issuers and end users, while others believe that the EPC should be as self-explanatory as possible.





Table 2: Overview on results of discussion about possible solutions for digitalization and customization of the EPC, about splitting it into two versions and about communication between end-users and EPC issuers.

	yes	partially	no
<p><b>„digital version of EPC“ as add-on</b></p> <p>■ yes ■ partially ■ no</p> 	<p>Digital of course, add-on information can be an option [Spain]</p> <p>QR Code on EPC and access to national EPC - Database with additional information [Austria]</p> <p>A digital version is the best solution for a modular development of the EPC [Spain]</p>	<p>Advantage reflection of real costs. [United Kingdom]</p> <p>This solution may be confusing as it brings an EPC close to energy audit (standard vs. real situation) [Germany]</p> <p>How to access &amp; how ready are people for this? [United Kingdom]</p> <p>What would be the cost of the digitalization and user profiles? [Ireland]</p>	
<p><b>Customizable EPC through different user profiles</b></p> <p>■ yes ■ partially ■ no</p> 	<p>Three stages EE User, standard conditions and Comfort user may make sense to present [Austria]</p> <p>Advantage: Incorporation of different user profiles &amp; EPC-versions in user friendly digital platform would have potential. [Ireland]</p>	<p>A part of the certificate could be customized. There are aspects that must be common and not customizable, such as elements that allow a reliable comparison between buildings [Spain]</p> <p>What is a typical user when property changes user? [United Kingdom]</p>	<p>It depends on the purpose of the EPC. When comparing buildings, using different 'user profiles' will distort the understanding of the results. [Poland]</p> <p>No large demand for customization [Flanders]</p>
<p><b>Splitting EPC in two versions – end-user and administration oriented</b></p> <p>■ yes ■ partially ■ no</p> 	<p>Could be useful to adjust the EPC to different needs and targets [Portugal]</p> <p>Good approach and important that users are getting all the detailed information as well and not only a polished end-user page; for first information it is fine but more detailed data has to be made accessible [Austria]</p>	<p>The division only makes sense in the exploitation of digital data, but the certificate as an official document must be unique [Spain]</p> <p>Very interesting to add two versions, but there cannot be any contradictions or gaps between the two versions [Flanders]</p> <p>Split information for general user and for technical staff must be on same document [Romania]</p> <p>It could be the same EPC consist-ing of 2 parts [Italy]</p>	<p>More costs for the clients, hard to issue in multi apartment buildings. [Finland]</p> <p>This might increase the price of the EPC [Poland]</p> <p>What would be the cost of the digitalization and user profiles? [Ireland]</p>
<p><b>Improvement of communication between end users and EPC issuers</b></p> <p>■ yes ■ partially ■ no</p> 	<p>We discovered that assessors and end-users do not speak together and this lowers the impacts of EPCs - a next generation of EPCs should provide more opportunities of exchanges with end-users [Italy]</p> <p>Better communication to help end-users to understand EPC can be helpful [Spain]</p>	<p>Depends - if an EPC is a snap shoot of energy status, then communication is less important than in case of an upgraded EPC into a roadmap with additional info - there communication is of growing importance [Austria]</p>	<p>The EPC should be as self-explaining as possible. If there is an additional need of communication between issuers and end users that would mean that the tool can't serve well its goal. [Spain]</p>



### 3.1.3. Criteria-set for an adequate EPC derived by user need assessment

Regarding the criteria-set for an adequate EPC derived by user need assessment from the end-user interviews and workshops from the six ePANACEA partner countries, a set of eight criteria could be derived:

1. **Reliable**
2. **Comparability of EPCs**
3. **Individual energy rating (whether, user..)**
4. **Understandable information**
5. **(Making things) concrete**
6. **Adequacy (Original purpose / different needs)**
7. **Dynamic & Digital**
8. **Comprehensive (additional data)**

Aiming at this criteria-set, the following question was discussed for each of the criteria: "Do you agree with the derived criteria-set?" In summary, the participants of the five 2. REB meetings gave the following feedback.

High agreement of 60% on derived criteria-set, as shown in Figure 10.

*Point 7: Dynamic & Digital raises a number of questions: This point might add complexity [Austria]; Dynamic EPC: issue is how to make it possible? [Flanders]. [Finland] do not agree with point 7. Criteria have for Italy only sense if the monitored on a periodic basis.*

*The affordability in terms of end-user and the management of the system is a question [Ireland] as well as if the homeowner can add info and then EPC is updated → they might have not enough knowledge [Flanders].*

■ yes ■ partially ■ no

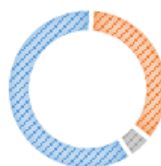


Figure 10: Approval rate – Criteria-set for an adequate EPC derived by user need assessment

### 3.1.4. Discussion of Expert feedback

The derived insights and recommendations from end-user interviews and workshops from 6 countries showed some expert feedback, which was again discussed during the 2. REB meeting:

**“What do you think about the feedback/ criticism that have been made by other experts?”**

1. **Could such a comprehensive tool still be called EPC? Would it not change the purpose?**
2. **Maybe, the purpose/scope of the EPC should in future go beyond comparing the energy performance of buildings?**
3. **Improving the reliability and content of EPCs does not and should not have to mean more technical content and significantly higher prices!**



Participants highly or partially agree on these comments. The risk of having too much information was highlighted, therefore the EPC could become more modular with different levels of information. Energy audit and *environmental certification schemes* for the more detailed approach should not be replaced.

*The EPC can be very useful, but the fact that it can be useful in many areas does not mean that it is positive to implement it that way, since the cost of the EPC and the trust and penetration of users can be much more complicated. [Spain]*

*If EPCs have to be prepared for low-income end-users and/or social-housing, of course the price has to be a fixed one [Italy]*

*There are some building environmental certification schemes and EPC should not replace them [Poland]*

### 3.2. Convergence and prioritisation of key indicators for EPC's

In the last part of the 2nd REB meetings, the "Convergence and prioritisation of key indicators for EPCs" was discussed. For this purpose, two summary sheets were developed based on the input from stakeholders during the first REB meetings. For this purpose, a general EPC front page was added, thus creating an overview sheet for all stakeholders (administration and end-users), and the now second page "Administration-oriented EPC overview sheet" was adapted. The content of each page was evaluated and discussed with the experts of the five REB meetings.

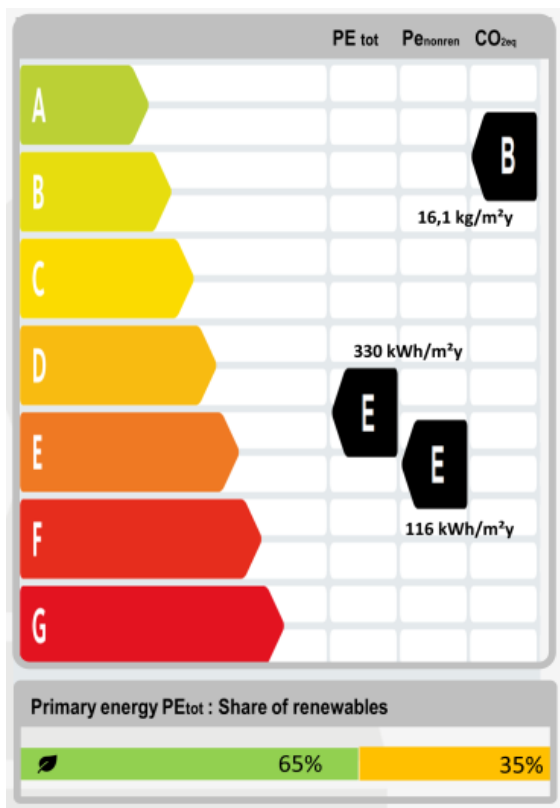
#### 3.2.1. Indicators and new layout of EPC: General EPC summary sheet for all stakeholder (administration group and end-users group)

In the regard of the indicators and new layout of EPC: General EPC summary sheet for all stakeholder (administration group and end-users group) (see Figure 11 for details) the following questions was discussed with the participants.



Figure 11: General EPC summary sheet for all stakeholder (administration group and end-users group)

**Do you agree on the three main performance indicators (see Figure 12)?**



High agreement on the important performance indicators for administration and policy makers. A building specific indicator is missing.

- PE<sub>tot</sub> [kWh/m<sup>2</sup>y] - total primary energy use
- PE<sub>nonren</sub> [kWh/m<sup>2</sup>y] - non-renewable primary energy use
- CO<sub>2 eq</sub> [kgCO<sub>2eq</sub>/m<sup>2</sup>y] - green house gas emissions

**Energy use [kWh/m<sup>2</sup>y] – missing as indicator**

Additional indicators were mentioned – mainly an indicator for the energy use for space heating, DHW, Cooling and Lighting was required.

*The end-user is interested in information how much energy his building will use and what will be the cost of energy. The primary energy does not answer how much energy this building will use. Delivered energy seems the best indicator for that. [Poland]*

*What about end energy? [Germany]*

*The energy performance indicator(s) should bring to light the energy efficiency first principle; a practice of neglecting energy efficiency compensated by adding PV should not be encouraged. [Western REB]*

*Final energy demand is also useful (divided by thermal / electrical energy) [Romania]*

Figure 12: The three main performance indicators

**CO<sub>2 eq</sub> [kgCO<sub>2eq</sub>/m<sup>2</sup>y]- Green house gas emissions – only energy related CO<sub>2</sub> or also CO<sub>2</sub> emission generated by the building construction?**

CO<sub>2</sub> is useful as environmental indicator and needed for public reports. Question is if the CO<sub>2eq</sub> is only for energy use [Finland, Austria] or also for the building construction materials. Feedback from UK and Finland that the information is/will be outdated.

*Energy network develops and CO<sub>2</sub> emissions drop and it could be that just in few years the information is outdated. [Finland]*

*Carbon factors in UK are outdated [UK]*

*CO<sub>2</sub> it is needed for different reports [Austria]*

**Share of non-renewable/renewable primary energy**

The grid chosen for the building is carried out as main factor for this indicator. A concern is that technical equipment can compensate a non-efficient building envelope.

*Share of renewables more depends on grid operations rather than on building (except for locally produced RE) [Estonia]*

*A practice of neglecting energy efficiency compensated by adding PV should not be encouraged [Western REB]*

*Redundant information should be avoided - If you have PE total and REN%, then the PE nonren could be eliminated [Romania]*

**Do you think that Recommendations and Energy Efficiency Potentials are relevant for the target group of the administration (see Figure 13)?**

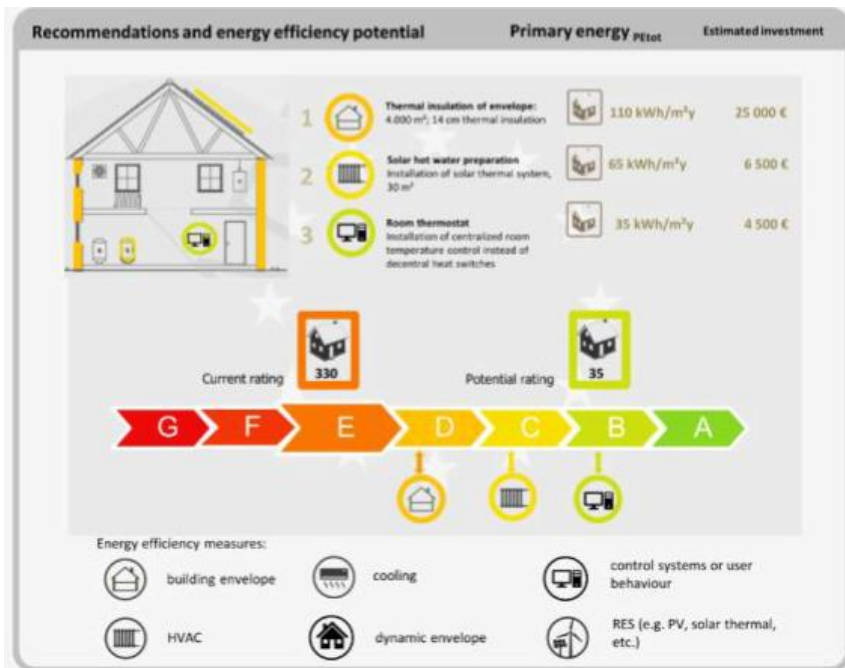


Figure 13: Recommendations and Energy Efficiency Potentials

78% agree with the presented road map with prioritization and added savings and range of costs for each step, as shown in Figure 14. Investment ranges or averaged values for specific costs could be seen as alternative way to describe the cost efficiency. For private houses this could be appropriate, for larger buildings it needs another methodology.

*Costs to be presented either as ranges, or based on standardized (average) values for specific costs (e.g. EUR/sq.m of insulation) [Romania]*

*On the part of recommendations and energy efficiency potential, it was stated that this is useful, however it should be kept in mind that EPC-administrations are interested to use this in statistical purpose and for this it should be taken for a database/statistical aggregations. Otherwise, this part is mainly useful for end-users and not administration. [Western REB Members]*

*Maybe it would be better to use cost / investment ranges instead of absolute values. This conveys better the idea that this is an estimation. [Spain]*

■ yes ■ partially ■ no



Figure 14: Approval rate – Recommendations and Energy Efficiency Potentials are relevant for the target group of the administration

### 3.2.2. Indicators and new layout of EPC: Administration oriented EPC summary sheet

Based on the approach in 3.2.2. and the indicators and new layout of EPC: General EPC summary sheet for all stakeholder (administration group and end-users group) the following questions was discussed for indicators and new layout of EPC: Administration oriented EPC summary sheet (see Figure 12 for details).

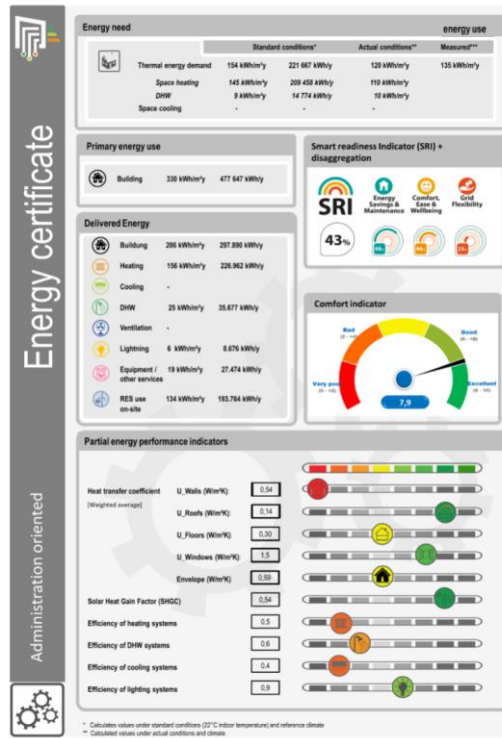


Figure 15: EPC summary sheet for administration group

#### 3.2.2.1. Why could using actual conditions for calculating the EPC be helpful for policy makers and EPC administration?

The calculated energy demand under actual conditions is not so interesting for the administration-oriented users. Several participants mentioned that EPCs can increase in price. In addition, the comparison between buildings will no longer be possible. About 80%, as shown in Figure 16, of the participants disagreed to include this information in EPCs.

*Gives more information but needs more information gathering than standardized condition. Usually more expensive way to do it. [Finland]*

*EPC is not an audit [Spain]*

*Might not be the ideal tool for EPC policy makers. Could be relevant for a specific homeowner wanting to know in detail the impact of recommendations [Portugal]*

*More expensive and needs highly qualified experts. [Romania]*

*Comparison between buildings is not possible any longer [Austria]*

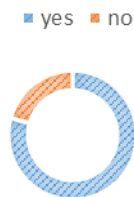


Figure 16: Approval rate – Helpfulness using actual conditions for calculating

### 3.2.2.2. Why could using measured data for EPC be helpful for policy makers and EPC administration?

It could be necessary for policy makers to know the real consumption in order to better define energy policy strategies. As shown in Figure 17, 21% of the participants voted for yes. In a database it would be a useful information, but there is the concern that it is not easy to get the data of large existing buildings. 33% partially agreed. Measured energy use takes into account the behaviour of the users and weather conditions. 46 % are against the use mainly because the value does not give comparable information about building energy performance.

*Measured energy use; in database would be useful. Measured energy needs would only be interesting for end-user to better identify with indicator and link with renovation measures, not so much interesting for administration. [Western REB Members]*

*Might not be the ideal tool for EPC policy makers. Could be relevant for a specific homeowner wanting to know in detail the impact of recommendations. [Portugal]*

*As in all the EU projects on EPCs we are looking to have comparative scales among EU countries, and this might not be possible [Italy]*

*Measured energy for multiple years and only for utilities is seldom available and includes user behavior; it should be used with caution [Romania]*

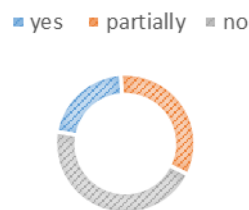


Figure 17: Approval rate – Helpfulness of using measured data for EPC

### 3.2.2.3. What is your opinion about integrating Smart Readiness Indicator and Comfort Indicator on the first pages of the EPC?

As comfort is individually and cannot so be measured easily, there is a concern that it may cause new doubts related to EPC. A provable and transparent procedure to benchmark the indicators is required, such as benchmarks set by national authority according to EN standards.

As 31 % voted for yes, 25% partially agreed and 44% voted for no there is no clear agreement to integrate these indicators on the first pages of the EPC (see Figure 18).



*Usefulness of Comfort indicator and SRI in EPC for administration oriented is not acknowledged by most of REB members. The graphical presentation of these indicators also draw too much attention in the current layout. [Western REB Members]*

*Most people are looking for energy and emission scales. Good performance and bad comfort how is it quantified? [Romania]*

*Comfort indicator may be vague data, unless calculated or monitored in detail. It can cause new doubts related to EPC [Austria]*

*I agree with the relevance of Comfort Indicator related to health aspects of people living in - there is high attention about it as buildings can be a risk for contaminants, allergies, respiratory diseases, ....but on the third page. [Italy]*

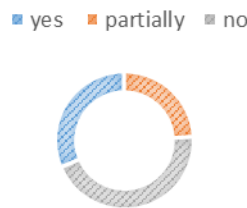


Figure 18: Approval rate – Opinion about integrating Smart Readiness Indicator and Comfort Indicator

#### 3.2.2.4. Administration oriented EPC summary sheet -additional comments

The most noteworthy outcomes on the presented EPC with target audience administration are:

1. The administration-oriented EPC should be accompanied by a database, several participants recommended. Interested owners/renters must have access to the administration-oriented summary sheet.
2. The readability and clearness of the graphical implementation was evaluated as good and easy to read. Graphics should be standardized as for home appliances.
3. For measured data the note that the energy use is measured was missing, (see on the certificate in the first row marked in yellow).
4. It was considered important that the scales for the energy performance indicators clearly indicate what is good and what is not for each region or country. Whether an indicator is positive (green) or negative (red) may depend on climatic aspects, for example. A high solar heat gain factor - solar energy entering the building - may be welcome in Norway and undesirable in Greece. Additional indicators missing listed: e- Mobility, access to public transport and to garden/parks, self-consumption - energy storage, potential to install ground source heat pump, wind, solar gain, PV, exported energy and energy communities.



## 4. SUMMARY AND NEXT STEPS

### Insights and recommendations from end-user interviews and workshops

Four categories were used to summarize findings and recommendations and solicit agreement or dissenting opinions from participants: "end-user and other stakeholder needs," "possible and suggested solutions," "criteria set for an adequate EPC derived by user need assessment," and "expert feedback." The main outcomes are:

- Information about the real energy consumption related to the energy costs is an aim for 91% of all participants, even though energy costs vary on the market and over time, and thus cost predictions should be viewed with caution.
- Detailed individual recommendations are needed. The reasons for renovation / investment should be transparent and defined in a clear step to step renovation roadmap.
- Affordable prices and comparability of the quality of the buildings should remain a focus.
- Digital version: A high level of agreement with the benefits of a digital version of the EPC where additional information could be requested.
- The risk of having too much information was highlighted, therefore the EPC could become more modular with different levels of information. Energy audit and environmental certification schemes for the more detailed approach should not be replaced.

### Indicators and new layout of EPC: General EPC summary sheet for all stakeholder -administration group and end-users´ group:

Convergence and prioritization of key indicators for EPCs

- PE<sub>tot</sub> [kWh/m<sup>2</sup>y]... total primary energy use and CO<sub>2</sub> eq [kgCO<sub>2</sub> eq/m<sup>2</sup>y] - green house gas emissions are reconfirmed as main indicators
- Redundant information should be avoided. If you have PE total and REN%, then the PE nonren/ren could be eliminated and pictured as renewable % in the graphic: Share of renewable.
- Energy use [kWh/m<sup>2</sup>y] as indicator is missing.

Recommendations and energy efficiency potentials are relevant for the REB participants. 78% agree to the presented road map with prioritization and added savings and range of costs for each step. Investment ranges or averaged values for specific costs could be seen as alternative way to describe the cost efficiency.

### Indicators and new layout of EPC: Administration oriented EPC summary sheet

Using measured data for EPC is necessary for policy makers to know the real consumption in order to better define energy policy strategies. Measured energy use takes into account the behaviour of the users and weather conditions, therefore a database would be useful.

Smart Readiness Indicator and Comfort Indicator: As comfort is individually and cannot so be measured easily, there is a concern that it may cause new doubts related to EPC. A provable and transparent procedure to benchmark the indicators is required, such as benchmarks set by national authority according to EN standards.

Summary of obtained feedback on the presented EPC with target audience administration:

- Several participants recommended that administration oriented EPC should be accompanied by a database. Interested owners/renters must have access to the administration-oriented summary sheet.
- Scales for the energy performance indicators have to indicate clearly what is good and what is not for each region or country. If an indicator is positive (green) or negative (red) can vary depending for example on climatical aspects.



- Additional indicators missing listed: e-Mobility, access to public transport and to garden/parks, self-consumption - energy storage, potential to install ground source heat pump, wind, solar gain, PV, exported energy and energy communities.

### **Upcoming REB activities**

As has been the case since the 1st REB meeting, REB members will continue to be kept informed about the project results via the REB exclusive area and provided with the latest outputs. The purpose of this is that stakeholders and experts in the field of Energy Performance Certificates play an immensely important role as creators, users and customers and therefore need to be involved in the elaboration of further developments in order to evaluate and further improve the developed results and methods.

In addition to the 3rd REB meeting at the end of 2022, there will also be a second questionnaire on selected topics and current issues within the project and the consortium.





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