U-CERT
User-Centred Energy Performance Assessment and Certification

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H2020 U-CERT project

– breeding ground for the next generation Energy Performance Assessment and Certification

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U-CERT (Towards a new generation of user-centred Energy Performance Assessment and Certification; facilitated and empowered by the EPB Center[1]) is a Horizon 2020[2] project funded by the European Union under Grant Agreement 839937[3] and running between September 1st 2019 and August 31st 2022. REHVA and EPB Center are among the 15 U-CERT team members together with 9 REHVA Member Associations (involved directly or indirectly).

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Specific challenge[4]

Under the Energy Performance of Buildings (EPB) Directive[5], all EU countries have established independent energy performance certification systems supported by independent mechanisms of control and verification. However, current practices and tools of energy performance assessment and certification applied across Europe face a number of challenges.

Assessment processes and certificates have to become more reliable, user-friendly, cost-effective, have comparable good quality and be compliant with EU legislation in order to instil trust in the market and incite investments in energy efficient buildings. They have to increasingly reflect the smart dimension of buildings and at the same time, facilitate convergence of quality and reliability of Energy Performance Certificates (EPCs) across the EU. The building energy performance methodologies should also ensure a technology neutral approach, be transparently presented making use of International and European standards, in particular the set of ISO and CEN EPB standards[6] developed under Commission mandate M/480[2] aimed at enabling the presentation of national and regional choices on a comparable basis.

These next-generation energy performance assessment schemes will value buildings in a holistic and cost-effective manner across several complimentary performances: envelope performances, system performances and smart readiness (i.e. the ability of buildings to be smartly monitored and controlled and, to get involved in demand-side management strategies). The assessment should be based on an agreed list of parameters/indicators, such as e.g. calculated annual final energy use, share of renewable energy used, past (climate corrected) final energy consumptions and energy expenditure, comfort levels or the level of smartness. The assessment methods should increasingly take into account output measures of performance (actual measured data) making use of available and increasing number of building energy related data from sensors, smart meters, connected devices etc.. These new schemes should contribute to improving the effective-

ness of certificates, by demonstrating how these could be strengthened, modernised and best linked to integrated national/regional certification schemes within a framework that aids compliance checking and effectiveness of financial support.

U-CERt's objectives

U-CERT has the following five measurable objectives:

1. Stimulating and enabling the co-creation and implementation of the new generation of EPC schemes with a wide based support;
2. Enhancing the new certification schemes to be more practical, reliable, understandable and desirable by a holistic and user-centred approach;
3. Making the new certification schemes easily accessible for a wide range of users and stakeholders by the services of the EPB Center;
4. Providing evidence of applicability and usefulness of developed schemes by testing the U-CERT approach in selected cases;
5. To foster the EU-wide uptake by motivating and activating EU interest groups and national certifying and standardisation bodies.

U-CERt's overall concept

U-CERT builds upon recent actions for developing a holistic energy performance assessment and certification. It will rely on previous and ongoing initiatives, including existing voluntary holistic environmental performance rating schemes. Additional indicators related to health and well-being based on e.g. EN 16798-1 'Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics' will be considered and added in this project to the EPC framework to assess indoor air quality and comfort in the scope of building performance improvement. It should be salient in this day and age that indoor environment has also an impact on the market value of buildings.

U-CERT will start with identifying the specific barriers and the possible drivers to use a next generation of Energy Performance Certificates (EPCs). To make EPCs more user friendly, better reliable and trustworthy an anthropology-based approach will be applied, using among others focus groups of each user group. Following this holistic approach U-CERT will create added value and enable enhanced building value (by reliable and 'desirable' energy performance certificates) and make the energy assessment process more cost-effective.

Manufacturers of products used in buildings having an impact on the Energy Performance of Buildings and their systems, are required to declare relevant product information according to the rules and requirements for energy labelling and ecodesign[7]. The data included in these product declarations (labels) are in many cases insufficient or not directly useable as input value for the EPB calculation procedures as included in the set of EPB standards and in future national annexes. To bridge this gap, support for the relevant stakeholders, i.e. designers and energy performance assessors of buildings and HVAC systems, manufacturers of these products, need support and assistance. They are not always aware of this information gap neither in the position to deliver the additional data needed for a correct energy performance assessment lacking the sufficient knowledge. U-CERT will develop services to bridge this information gap by publishing procedures and offering guidance to suppliers on how to develop and deliver the data needed for EPB calculations.

U-CERT facilitates the shift to the next generation EPC paradigm by taking the Smart Readiness Indicator (SRI) to the practical level and developing an optimal

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recipe of SRI functions that a given building should have installed to enable building operational rating based on the calculation methodology of the EPB standards (measured building data → weather and behaviour normalization → building operational performance).

The U-CERT Building Operational Rating solution is envisaged as a cloud-based service, accessible through any web browser with a user account, that would enable an evidence based decision-making process. The building assessor would have access to the backend of this interface for conducting all the necessary calculations (partly automated) using calculated input data (import from national EPC database, EPB standards and product data) for the Building Asset Rating and measured input data (EPB Standards and SRI functions) for Building Operational Rating. The end-users can browse through relevant information displayed in the front-end. Additionally, the building assessor could provide advice suggesting improvements in behaviour and/or recommending building performance improvements.

The visualization of these Building Asset Rating, Building Operational Rating and advice for building performance improvement by the end-users shall constitute a valuable trigger point for actually applying the building performance improvement(s). The Building Operational Rating will prompt users to access the interface on a seasonal or annual basis. Furthermore, the end-users can access the interface and visualize the information whenever wanted.

Once a building performance improvement is applied this would be fed in the Building Operational Rating solution and its impact shall be quantified in the next Building Operational Rating exercises.

The U-CERT Building Operational Rating solution will be stored on the cloud and shall be easily accessible as needed by national authorities (e.g. compliance check and verification, evidence-based policy making), financial institutions (e.g. loan surveillance, additional channel to new clients), researchers interested in building stock characteristics and other stakeholders.

Furthermore, continuously calculating building operational performance based on measured building data will allow continuously improving building performance and quantifying the effects of individual steps of a e.g. Building Renovation Roadmap/Passport.

The U-CERT Building Operational Rating solution would also create a valuable feedback loop for improving the quality of services offered by building designers and contractors. Moreover, building professionals could develop new services, benefit of closer and more frequent contact with their clients and prepare for the future market shift from products to services.

Lastly, financial institutions might be interested using the U-CERT Building Operational Rating solution interface as a mandatory condition when offering loans for building performance improvements.

How to stay informed about U-CERT activities

U-CERT's website and social media accounts will be ready by the end of 2019. Continue following REHVA's communication and dissemination channels to be among the first who will visit U-CERT website, subscribe to U-CERT's newsletter and start following U-CERT on your preferred social media. ■

References

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6 https://www.rehva.eu/activities/epb-center-on-standardization/epb-standards-energy-performance-of-buildings-standards

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