Report of Workshops in REHVA World Congress CLIMA 2019

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WS organizer:

REHVA
www.rehva.eu

European Ventilation Industry Association (EVIA)
www.evia.eu

EPB Center
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European Partnership for Energy and the Environment (EPEE)
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Chair:	*Jaap Hogeling, Director EPB Center, jaap.hogeling@epb.center*
Co-Chairs:	*Dick van Dijk, Senior Expert EPB Center, dick.vandijk@epb.center*

Presentations at the Workshop:

1. The promising prospect of EPB standards and the revised EPBD, (*Pau GARCIA AUDI, European Commission, Pau.GARCIA-AUDI@ec.europa.eu*)
2. Introduction to the roll-out of the set of EPB standards, (*Jaap Hogeling, EPB Center, jaap.hogeling@epb.center*)
3. The national implementation process of the EPB standards in Romania, (*Iuliana Chilea, Director General, ASRO, Romania, iuliana.chilea@asro.ro*)
4. EN ISO 52016-1 Energy need calculation (heating/cooling) and calculation of indoor temperatures: hourly or monthly? (*Dick van Dijk, Senior expert, EPB Center, dick.vandijk@epb.center)*
5. EN 16798-5-13 How to use the set of ventilation and cooling standards? Coordination issues with heat pump calculation (EN 15316-4-2) (*Gerhard Zweifel Senior Expert, Consultant, Switzerland, gerhard.zweifel@hslu.ch*)
6. Synergies with linked EU projects: CEN-CE & ALDREN (*Johann Zirngibl, CSTB, ALDREN & CEN-CE coordinator, johannzirngibl@aol.com*)
7. EPB Standards Community facilitated by REHVA (*Andrei Vladimir Litiu, REHVA, avl@rehva.eu*)
8. Benefits and challenges of the roll-out of EPB standards. Industry perspective (*Andrea Voigt, EPEE, a.voigt@epeeglobal.org)*
9. Ventilation related EPB standards and their contribution to deliver high IEQ (*Claus Händel, EVIA, claus.haendel@evia.eu)*

Introduction and background

EU Member states are required to transpose and implement the Energy Performance of Buildings (EPB) policy in their country. Moreover, they are expected to use the EPB standards and report back to the European Commission (i.e. the revised EPBD requires Member States to fill in a few specific templates).
The EPB Center (www.epb.center) has been set up to support EU Member States with the uptake of the (CEN and CEN ISO) EPB standards, by providing tailored information, technical assistance and capacity building services for involved stakeholders.
The set of EPB standards, published in 2017, provide EU Member States a toolbox to help the implementation of the Directive and furthermore aim at higher transparency regarding the energy performance calculation methodologies. Each EPB standard has a template for a National Annex that enables Member States to tailor the methodology to the national situation and needs.
The main scope of this workshop is to inform and ask feedback on the implementation of EPB policy at national level. The organizers endeavour to help participants with the requirement of filling in the templates required by the revised EPBD. Additionally, they shall provide information and interact with participants for collecting feedback from professionals involved or interested in the EPB assessment and implementation.

Summary of the presentations

Mr Garcia Audi, Policy Officer at DG ENER, European Commission, highlights the promising prospect of EPB standards and the revised EPBD. He presents an overview of the new developments in the EU regulations related to energy efficiency and highlighted the main outcomes of the 2018 revision of the EPBD, such as a stronger role for long term renovation strategies, enhanced transparency of national building energy performance calculation methodologies, reinforcement of building automation and the introduction of a Smart Readiness Indicator for buildings.

The new obligation (EPBD Annex i) for Member States to describe their national calculation methodology following the National Annexes of the 'overarching' EPB standards (EN ISO 52000-1, 52003-1, 52010-1, 52016-1, 52018-1) aims to improve transparency and comparability. Mr Garcia Audi emphasizes, however, that this does not constitute an obligation on MS to adopt the EPB standards.
Also new in the revised EPBD is for instance the requirement to express the energy performance as primary energy use (kWh/m^2.y),-again- aiming to improve transparency, without interfering with the national competence to define primary energy factors.
The revised EPBD puts more emphasis on the need to ensure thermal comfort, indoor air quality and health conditions, including how these should be taken into account in the calculation of energy performance.
The presentation is concluded with an overview of a number of studies and contracts aiming to provide technical input as guidance for effective implementation of specific EPBD elements. For example on the Smart Readiness Indicator and on the support to the use of the EPB standards.

With regards to the latter, Mr Garcia Audi calls all stakeholders to contact the EPB Center (www.epb.center) for any question related to the EPB standards, because a consortium, led by Mr Jaap Hogeling and centred around the EPB Center, has been contracted by DG ENER to provide answers and to prepare guidance and tools.

In his presentation, **Mr Jaap Hogeling**, director of the EPB Center, introduces the details of the three year Service Contract with DG ENER: "Support the dissemination and roll-out of the set of Energy Performance of Buildings standards developed under Mandate M/480". Mr Hogeling explains the background and current status of the set of about 50 international (CEN and partly ISO) EPB standards. In particular he explains how each EPB standard can be

tuned to fit to the national situation by making use of the specific choices offered in 'Annex A' of each EPB standard; such choices are recorded in a 'National Annex' or 'National Datasheet' to that EPB standard.

Under this contract the EPB Center will provide support with filling in the National Annexes of the EPB standards, information about the set-up /structure and use of the EPB standards, FAQ on key issues, calculation tools and case studies for individual standards and practical examples tailored to the needs of different stakeholders.
The EPB Center also aims to provide a practitioners platform to share knowledge and support the ambitious uptake of the EPB standards.

Mrs Iuliana Chilea, Director General of ASRO, the national standards body of Romania, presents the national implementation process of the EPB standards in Romania. All published standards and standardization documents have been adopted as national standards by publication of the Romanian version. However, as also mentioned by Mr Hogeling, Mrs Chilea stresses that national annexes are to be produced, to make the standards applicable to the national situation. This requires e.g. acquisition of climatic data (which she fears is very costly), processing of these data, research activities and drafting of the annexes.
Four EPB standards have been selected, to start with. The current situation is that discussions are taking place with the competent authority (MRDPA) on the development of the first national annexes and a document "Methodology for the assessment of energy performance of buildings" is in preparation (MRDPA contract) and includes references to EPB standards. The application and use of EPB standards will be mandatory in Romania.
Romania participates in the H2020 project U-CERT ("Towards a new generation of User centred Energy Performance Assessment and Certification; facilitated and empowered by the EPB Center"), starting in September 2019. Mrs Chilea expects that this project will assist and facilitate the development of the national annexes.

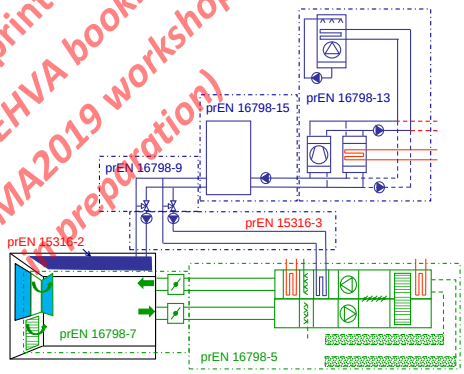
Mr Dick van Dijk, senior expert at the EPB Center, presents the main features of EN ISO 52016-1, the EPB standard to calculate the energy needs for heating and cooling and indoor temperatures. One of the key assets of this standard is that it comprises, side by side, both an hourly and a monthly calculation method. This enables countries to choose between these two. Mr van Dijk emphasizes that in this new standard the hourly method has been significantly improved compared to its predecessor, the widely used EN ISO 13790 from 2008, while at the same time it has been ensured that the number of input data to be supplied by the user for the hourly calculation method are kept the same as for the monthly method.
This makes it easy for a country to switch from the (often traditionally used) monthly method to the more powerful and realistic hourly calculation method.
In the past, the high heat losses dominated the thermal balance. In those days, the monthly calculation method was able to provide sufficiently accurate, transparent and robust results, by the use of one or two correction factors to deal with the dynamic fluctuations of heat losses and gains. Nowadays (for new buildings or major renovation) the heat losses are low and no longer dominating: the thermal balance has become much more dynamic over the day and week. Under these conditions it is very difficult to find proper and robust correction factors for the monthly calculation method to deal with all kinds of dynamic effects (from e.g. solar blinds, ventilation, heat accumulation and systems). Ergo: the monthly calculation method becomes less accurate, less transparent and less robust.

Van Dijk concludes that the hourly method in EN ISO 52016-1 is transparent, robust and reproducible (thus: fit for use in context of building regulations), is tailored to the goal and can be used to validate or find the limits of a monthly method. Moreover, it provides a bridge to interactive system performance calculation (using the "system specific calculation mode") via exchanging input and output to/from system standards on hourly basis.

An important aspect, regarding the revised EPBD, is that only with the hourly method it is possible to obtain a realistic indication of the impact of the 'smartness' of a building and on the indoor environment and thermal comfort conditions.

The monthly and hourly method are demonstrated side-by-side in a spreadsheet on EN ISO 52016-1. An updated version will soon be available at the EPB Center website.

Prof Gerhard Zweifel, Senior Expert at the EPB Center, introduces the subset of EPB standards dealing with ventilation and cooling: the elements covered by each of the standards and how these interrelate. He emphasizes the fact that system calculations become simpler when using an hourly calculation interval. Prof Zweifel also introduces the spreadsheets that have been developed in parallel with these standards to validate and demonstrate the calculation procedures and the input/output relations. These spreadsheets can be found at the EPB Center website. The spreadsheet on EN 16798-5-1 has been updated and will be made publicly available via the EPB Center website at short notice.



He continues with explaining some coordination issues related to the cooling and heating generation standards. Specifically, there is a need for further harmonization between EN 16798-13 (chillers) and EN 15316-4-2 (heat pumps) and clarification. A CEN ad hoc group has been established to deal with these issues. The EPB Center aims to facilitate this activity and to keep you up-to-date on the progress.

Mr Johann Zirngibl, CSTB, introduces two EU Horizon 2020 projects that are related (complementary) to the activities of the EPB Center: the CEN-CE and ALDREN projects. Both EU projects aim to facilitate transposition of revised EPBD.
Mr Zirngibl stresses that only a common European transposition will allow to be able to work on the "other side of the border", to have a "level playing field" (fair competition) for products and to get common databases / common information.
He uses as example the primary energy use as performance indicator required by the EPBD: due to national differences there is no comparability other than the name of the indicator. **ALDREN**'s main indicator will be based on a common definition and common calculation procedures, using the EPB standards. Another issue addressed by ALDREN is the need to link energy renovation to economic interests, such as improved health & well-being and improved productivity.
The **CEN-CE project** aims at a EU-wide qualification and training scheme for 'CEN standard Certified Experts' based on the EPBD mandated CEN standards, with the main focus on the heating, economy and overarching EPB standards. Mr Zirngibl explains why it is important to have a training at European level.
The transposition of the revised EPBD offers the possibility for common implementation, considering technical progress and new challenges "instead of 34 national/regional different methods".
The CEN-CE and ALDREN projects are a step forward towards a common European method based on the EPB standards. With regard to this, Mr Zirngibl points to the early feedback received from Member States that a common European tool (software; now missing) could play an important role to facilitate the use of CEN standards and common transposition.

Mr Andrei Vladimir Litiu, REHVA, introduces the EPB Standards Community facilitated by REHVA and EPB Center and encourages all interested persons:

…to join the LinkedIn EPB Standards community:
https://www.linkedin.com/groups/13619324

…to visit the BUILD UP topic Energy performance calculation procedures and CEN standards:
http://www.buildup.eu/en/topics/energy-performance-calculation-procedures-and-cen-standards

…and to share and connect others to the EPB standards community and remember to use the hashtag #EPBstandards

Mrs Andrea Voigt, EPEE, the European Partnership for Energy and the Environment, adds the industry perspective regarding the benefits and challenges of the roll-out of EPB standards.
Mrs Voigt claims that the EU has put in place a robust framework, but there is a lack of implementation at national level. EPEE recommends 5 priorities for implementation at Member State level to unlock the potential of heating and cooling systems:

- Include inspection programmes in national renovation strategies and encourage follow up on inspection reports;
- ensure that BACS fulfill certain quality criteria and use EN 15232-1 to support implementation;
- use the set of CEN EPB standards;
- take into account part load conditions when inspecting, selecting and installing HVACR systems;
- use harmonized definition for high efficiency alternative systems, aligned with Ecodesign / Energy Labelling, and apply monitoring and control systems.

Mr Claus Händel, EVIA, the European Ventilation Industry Association, focuses on the ventilation related EPB standards and their contribution to deliver high indoor environmental quality (IEQ).
Mr Händel lists the various articles of the revised EPBD that address the issue of healthy indoor climate conditions, indoor air quality and comfort levels. He stresses that energy performance without definition of the indoor environmental quality (IEQ) makes no sense. Nevertheless, many EU Member States have no requirements on thermal comfort or indoor air quality (IAQ) for new buildings and no indicator for IAQ in the building EP Certificates.
He explains that IEQ requirements are provided in the EPB standards EN 16798-1 and EN 16798-3 and their accompanying technical reports. It is essential to know which indoor environment quality level you may expect with the assessed or expected energy performance level. Mr Händel continues with the presentation of some details of the common IEQ classification in EN 16798-1 (but with criteria for each level that are specified at national level), and some details of the classification of ventilation system design (in relation to outdoor air classes) for IAQ in EN 16798-3.
He concludes with a number of challenges for these two standards, such as the dual use for design and for energy performance calculation, the implementation of the revised EPBD, do the options for national choices fit to national legislation and to the requirements of the involved parties.

Discussion and main results

The presentations and discussions at the workshop were of interest for all sectors involved or interested in the EPB assessment and implementation: Member States, National Standardization Bodies (NSB), building professionals and students, industry and finance stakeholders.
The subjects covered a wide range of topics: implementing the set of EPB standards at national level, using the EPB standards in practice, conducting calculations for energy audits and energy performance certificates of buildings and building performance research.

The topics were presented and discussed from different perspectives covering the European Commission, EPB standard developers, national policy and implementation, industry and implementation support projects.

During the discussion specific technical details were discussed, e.g. on the primary energy factors and definitions of on-site and nearby in the EPBD and in the overarching EPB standard EN ISO 52000-1. Related to the implementation of an hourly calculation method, the JRC website was mentioned, hourly climatic data files for

any location in Europe can be downloaded freely. These data files will be connected to the spreadsheet of the relevant EPB standard, EN ISO 52010-1.
A comment was made that more transparency on the national EPB calculation methods is a good first step, but that there is an urgent need for ensuring the quality of national calculation methods to ensure that the promised results will be reached and to raise confidence by the end-users. This triggered a discussion on the affordability of the method, the quality and availability of input data and the need for (national) guidelines on how to assess the input values.

Conclusions and future work directions in the field

The need and potential of the set of EPB standards to bring the EPB assessment methods in Europe to a higher level of transparency and quality and to create a level playing field was widely recognized.

The European Commission issued a 3 year Service Contract to enable the EPB Center to provide:

- Support with filling in the National Annexes of the key EPB standards (including examples and FAQ);
- Information about the use of the EPB standards (including FAQs, tools and case studies on individual standards);
- Information on the set-up /structure of the EPB standards;
- Practitioners platform to share knowledge and support the ambitious uptake of standards.

It was concluded, and underlined by the many questions raised during the Q&A sessions that this technical support is very important and urgently needed.
In addition, it was recommended that options should be explored to come to an overall software tool to facilitate the use of CEN standards and common transposition.

A red thread through the presentations was the increased importance of the indoor environment quality. The revised EPBD provides the necessary framework and the set of EPB standards provide the tools (in the form of hourly calculation procedures and common classification). Now the Member States are requested to take the IEQ (more) seriously in their regulations.

References

- All information, questions, tools, etc. on the set of EPB standards can be found at the website of the EPB Center: www.epb.center.
- Development of specific instruments, specifically for deep renovation, based on the European Common Voluntary Certification Scheme for non-residential buildings (EVCS) is dealt with in the EU Horizon 2020 project ALDREN: www.aldren.eu
- EU-wide common large-scale training and qualification scheme for building professionals is being developed in the EU Horizon 2020 project CEN-CE: www.cen-ce.eu

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The sole responsibility for the content of the workshop and this report lies with the authors. It does not necessarily reflect the opinion of the European Commission.