Your service center for information and technical support on the new set of EPB standards

EU Renovation Wave, EPBD revision impacting the implementation of the set of EPB standards

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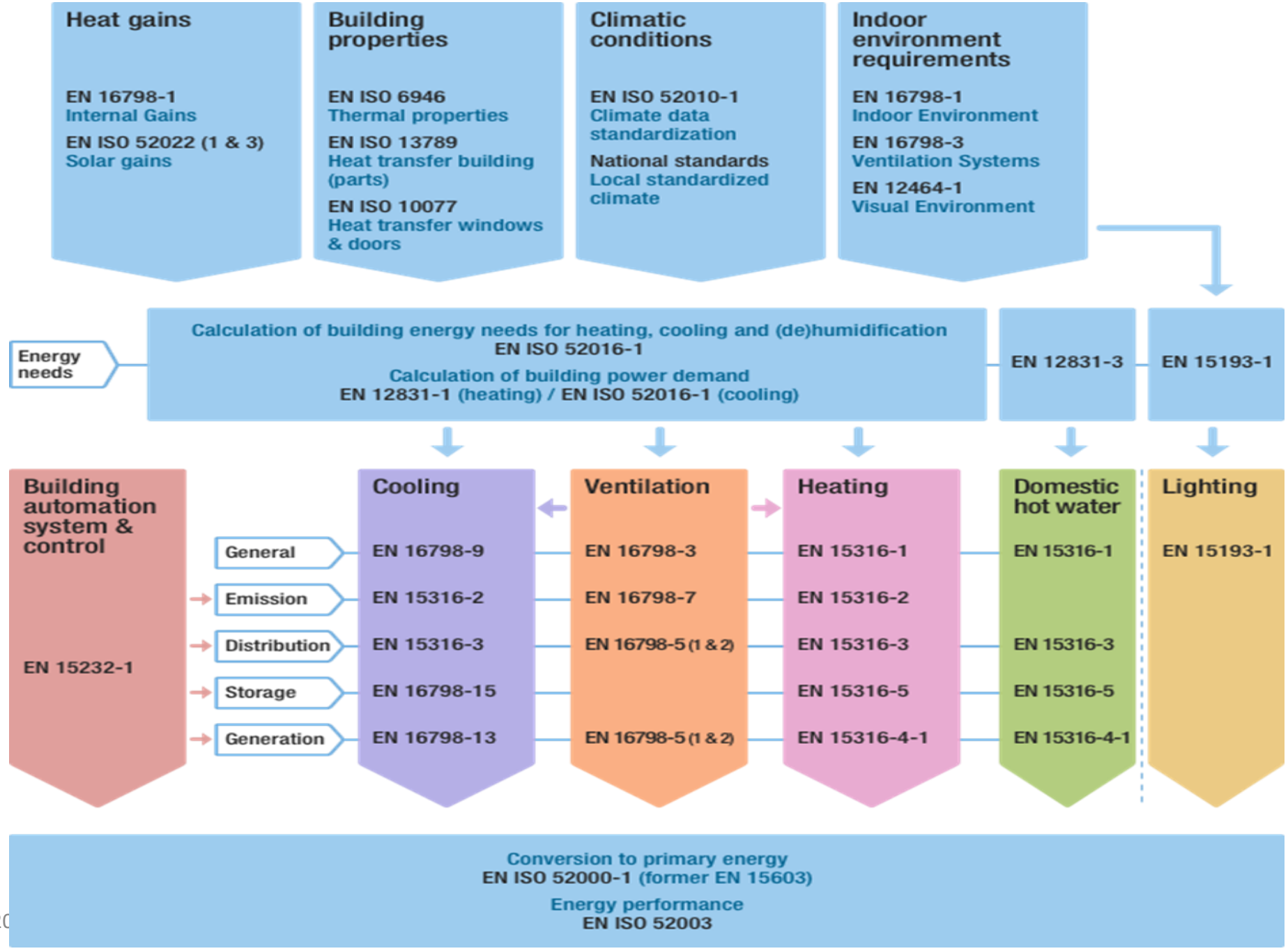
www.epb.center

NZEB and Renovation Wave

12th edition of the Romanian Conference on Energy Performance of Buildings, June 11th 2021

My background

- CEN/TC 371: Energy Performance of Buildings, chairperson since 2004
- Project leader of the EU Mandate/480 to CEN regarding the development of the set of EPB standards.
- Participation in 5 CEN/TC's and 2 ISO/TC's related to Energy Performance of Buildings
- Manager international standards at ISSO, Rotterdam, the Netherlands
- Initiator of EPB Center (an initiative of ISSO and REHVA)
- Fellow of ASHRAE and REHVA


Heat gains
EN 16798-1
Internal Gains
EN ISO 52022 (1 & 3)
Solar gains
Building properties
EN ISO 6946
Thermal properties
EN ISO 13789
Heat transfer building (parts)
EN ISO 10077
Heat transfer windows & doors
Climatic conditions
EN ISO 52010-1
Climate data standardization
National standards
Local standardized climate
Indoor environment requirements
EN 16798-1
Indoor Environment
EN 16798-3
Ventilation Systems
EN 12464-1
Visual Environment
Energy needs
Calculation of building energy needs for heating, cooling and (de)humidification
EN ISO 52016-1
Calculation of building power demand
EN 12831-1 (heating) / EN ISO 52016-1 (cooling)
EN 12831-3
EN 15193-1
Building automation system & control
EN 15232-1
General
Emission
Distribution
Storage
Generation
Cooling
EN 16798-9
EN 15316-2
EN 15316-3
EN 16798-15
EN 16798-13
Ventilation
EN 16798-3
EN 16798-7
EN 16798-5 (1 & 2)
EN 16798-5 (1 & 2)
Heating
EN 15316-1
EN 15316-2
EN 15316-3
EN 15316-5
EN 15316-4-1
Domestic hot water
EN 15316-1
EN 15316-3
EN 15316-5
EN 15316-4-1
Lighting
EN 15193-1
Conversion to primary energy
EN ISO 52000-1 (former EN 15603)
Energy performance
EN ISO 52003

EU Green Deal and Renovation Wave

- Buildings are acknowledged as one of the key focus areas for the **European Green Deal** and more specific the **Renovation Wave Strategy**.
- Finance is becoming more and more available and will reach out in the coming decades to the needed scale to transform buildings for reaching by 2050 a healthy, safe, efficient and sustainable decarbonised EU building stock.
- https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
- https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en

The Renovation Wave Strategy adopted October 2020

- ambition: at least double annual renovations of EU building stock with focus on deep renovation
- Basis for the **urgent revision of EPBD** (version 2018) to direct the national renovation strategies to achieve a decarbonised building stock by 2050
- 3 focus areas in Renovation Wave:
  - tackling energy poverty and worst-performing buildings> towards healthy housing
  - lead examples: priority for renovation of public buildings
  - decarbonisation of energy delivered to and exported from the buildings
- To accomplish this the Commission promotes MEPS (confusing term, better is to say **M**inimum **E**nergy **P**erformance **R**equirements), the use of EPC's, Digital Building Logbooks and Building Renovation Passports.

Process of EPBD revision

- Target: ready by end of 2021, various consultation mechanisms are being used , public consultation, public stakeholders WS's, questionnaire (closes June 22)
- Some observations:
  - Vision on decarbonisation of building stock, A large majority (74%) welcomed an **EU-harmonised GHG metric;** *which is great as the current EPBD includes just an encouragement to MS's to report on GHG emission at the EPC, some countries do, but not all*
  - **see EN 17423 Energy performance of buildings - Determination and reporting of Primary Energy Factors (PEF) and CO2 emission coefficient - General Principles**

EN 17423:2020

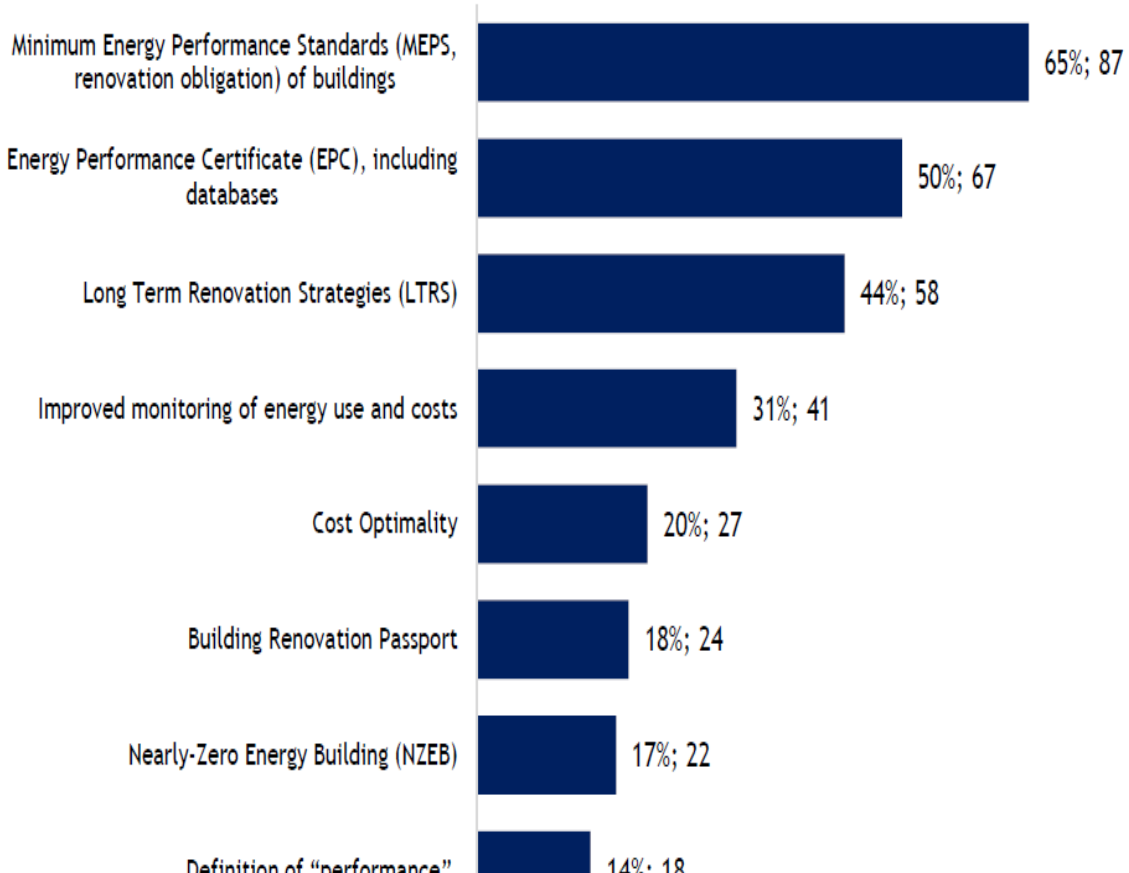
- The target group of this standard are all the users of the set of EPB standards and especially national standardization experts or building authorities who are in charge of defining the PEFs and CO2 emission coefficients.
- This standard provides a transparent framework for reporting on the choices related to the procedure to determine primary energy factors (PEFs) and CO2 emission coefficients for energy delivered to and exported from the buildings as described in EN ISO 52000-1.
- This standard specifies the choices to be made to calculate the PEF(s) and CO2 emission coefficients related to different energy carriers.
- Primarily intended for supporting and complementing EN ISO 52000-1, as this standard requires values for the PEFs and CO2 emission coefficients to complete the EPB calculation for the EPC

Content of EN 17423:2020

- General description of the methods and choices
- Basic principles of the assessment methods
- Short description of the choices
- Set of different choices related to PEF and CO2 emission coefficient
- Choices related to the perimeter — Geographical perimeter
- Choices related to calculation conventions
- Choices related to the data and to the assessment methodologies

Revision EPBD: Possible instruments to be prioritised to reach the 55% reduction target by 2030

Question 2. In the frame of the EPBD revision, which instrument would you consider as the priority because its revision or addition could make a difference towards the 55% target, you? (n=133)



- How to reach Minimum EP requirements (MEPS) for existing building stock?
- A phased introduction of EP requirements where the Long Term Renovation Strategy should be clear and EPC's and Building Renovation Passports could play a roll.

Revision EPBD : How to make EPC's of buildings more popular?

- **Address the performance gap** (calculated versus metered) and on-site verification
- **Also add an IEQ performance indicator**

  REHVA published earlier a position paper on these issues where deep renovation was also connected to improved IEQ. EPC's should include a IEQ indicator (see EN 16798-1 and TAIL indicator from ALDREN project).

- **Also connect it to a Building Renovation Passport and/or Digital Building Logbooks** which are accessible for the building owner and user

Address the **Performance Gap**

- The EP Asset rating is based on a standard user pattern and outdoor climate and not a prediction of the energy use of a building
- This is difficult to communicate: EPC's based on calculation are just there to compare buildings EP's
- The calculation procedure –especially when based on monthly calculation steps includes a lot of assumptions which may not be valid for all cases.
- The step to an **hourly calculation** procedure will improve the outcome see: — Documents — EPB Center | EPB Standards

Revision EPBD:

reducing the performance gap by improving the assessment procedure

- Apart that an hourly procedure is more easy to use , more transparent, reproduceable and innovation supportive it is expected that it will reduce the performance gap.
- This wish to reduce this gap to make the EPC more attractive for the general public could lead to more EU wide support for the development of an open EPB software kernel based on the set of EPB standards
- As this software is based on the set of EPB standards and thus fully traceable and transparent, which is needed when you want to use this in the context of building regulation.

Need for a common EU software kernel to support this hourly approach

- This greatly facilitates the uptake and practical application of the set of EPB standards, and avoids that the same work is done over and over again, in each country that decides to apply the standards.
- Further, making a suite of high-quality educational materials (making the link to the software use) freely available on-line will remove the last major threshold to the practical application.

Impact on the use of EPB standards?

- An more stringent policy regarding EPC's their quality and acceptance will emphasize the role of a correct use of the set of EPB standards
- an EU-harmonised GHG metric will make use of the EN 17423-2020
- Reducing the performance gap by improving the reliability of the calculated asset rating will require an hourly calculation step
- Hourly calculation step brings the use of the SRI to a next stage where the building and grid interaction will become visible and able to demonstrate the level of decarbonisation of the energy used by the building systems

On choice between hourly and monthly calculation method

- Several countries had already adopted an hourly calculation procedure
  - E.g. France, Spain. Often for non-residential buildings
- Several countries intend to change over to hourly method (for all buildings or for more complex building types & nZEB buildings)
  - e.g. Italy, Croatia..
- Several countries discuss to change over, but no decision yet, several German experts expect that this is likely next revision round
- Many countries express a need for (common core?) software

An example: EPB standards implementation in Italy

- Based on presentation by Laurent Socal
  - ISO international workshop, Seoul, Sept. 23, 2019

- and also REHVA article by Laurent Socal, Oct. 2019
- https://www.rehva.eu/rehva-journal/chapter/status-of-implementation-of-en-epb-standards-in-italy

Some rationale for the revision of standards in Italy

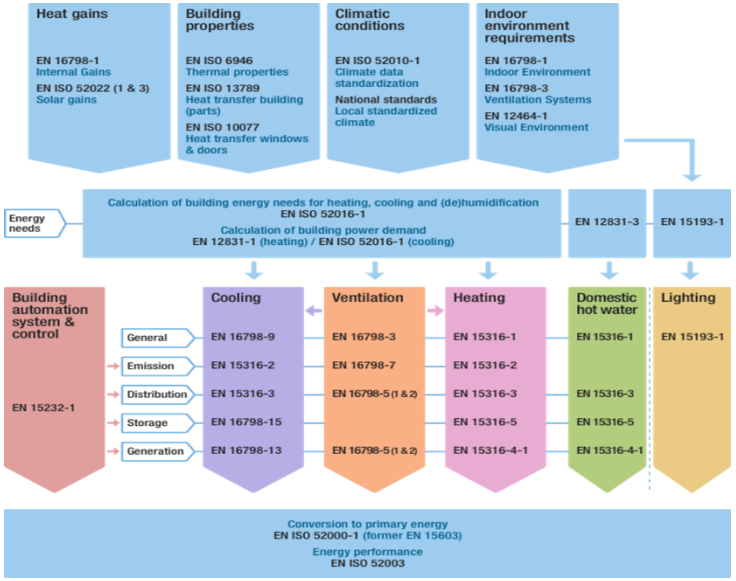
- Time step should be hourly
- Standards are required for legal purposes: energy performance calculation is required for comparison with requirements and references to get a building permit and to issue an EPC
  - → **the calculation procedure should be traceable**
- Professionals need training and tools (software) to apply new calculation standards
  - → **changes shall be limited in number and adequate time is required to develop application software once the procedure is defined**

Using EN ISO 52016-1 means that the description of the building doesn't change and the calculation procedure is fully detailed

Already available the hourly method in EN ISO 52016-1 as spreadsheet

- Can be run with same input data as needed for the monthly method
- Is easier to understand and more transparent
  - More direct: no need for correlation factors to account for dynamic interactions
- Gives additional insight in hourly indoor temperature and heating or cooling load
  - Monthly method: only monthly average
- Calculates heating and cooling needs in same calculation: reveals possible interaction
  - E.g. effect night time temperature set back on next day's cooling needs
  - Monthly method: no interaction between heating and cooling needs:
    - Heating needs = 12 months calculated with conditions of use assumed for heating (temp., blinds, vent.)
    - Cooling needs = 12 months calculated with conditions of use assumed for cooling (temp., blinds, vent.)
- See https://epb.center/documents/demo-en-iso-52016-1/

Thank you!



More information on
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