

Context and policies for energy and ventilation in Europe, new evolutions in EPBD

The IPCC reports on Climate Change: the drivers for European Union to launch policy programs like: EU Green Deal -Fit for 55 by 2030- Renovation Wave and REPowerEU plan (05/2022)

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The EPB Center is an initiative of ISSO and REHVA www.rehva.eu and was supported by the EU-Commission

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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
- ▶ Officer at Indoor Environmental Quality Global Alliance board www.IEQ-GA.net

EU Green Deal -
Fit for 55 by 2030
Renovation Wave
REPowerEU plan (05/2022)

- ▶ **drivers for the EPBD revision in 2022/23,**
- ▶ **will it affect the use of the set of EPB standards?**
- ▶ **A need to revisit the set of EPB standards**



21/05/2023

EU Green Deal, Renovation Wave, Fit for 55 by 2030, towards Zero Carbon emission by 2050 drivers to revisit the EPBD

- ▶ EPBD: Buildings are acknowledged as one of the key focus areas for the European Green Deal and more specific the Renovation Wave Strategy.
- ▶ ambition: at least double annual renovations of EU building stock with focus on **deep renovation to 3%**
- ▶ 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 (Minimum Energy Performance Standards) , MS's shall set, and regularly review, these requirements with a view to achieving **at least** cost-optimal levels, Those requirements shall take account of **general indoor climate conditions, in order to avoid possible negative effects such as inadequate ventilation**
 - ▶ The use of EPC's (Certificates) and Building Renovation Passports, which shall include information on circularity **as well as wider benefits related to health, comfort, IEQ, safety....** (art 10)

European green Deal: Carbon/Climate neutral by 2050

- ▶ The Building is no longer an energy consumer, but also an energy producer
- ▶ Optimize:
 - ▶ **Energy efficiency first:** building envelope & building systems
 - ▶ **Decarbonize** energy carrier and produce on-site **RENEWABLES**
 - ▶ Interaction with the energy grid (hourly/storage..) **Smart Readiness of buildings to become operational (SRI)**
- ▶ Step by Step towards Zero CO2
 - ▶ We have to show the impact of our components (products) in the energy chain:
 - ▶ AC, Heat Pump.. is not longer evaluated as a product, just looking at the product label, but part of the building system in a holistic way
 - ▶ We have to address the embodied Carbon as well!

EPBD: Energy Performance Buildings Directive of 2018 revisited in 2022/23: some basic assumptions

- ▶ An EU Directive gives guidance to the EU Member States regarding national regulation in a certain field, the EPBD is about energy performance of buildings regulation
- ▶ In the revision process and the negotiations between the EU Commission, the EU Parliament, the EU Council of governments and relevant stakeholders the **need to regulate EP of buildings and the Indoor Environmental Quality of buildings in the same way**
- ▶ EPB assessment should be calculated on basis of a methodology which includes **IEQ assessment**. (rec. 12)
- ▶ This shall be addressed for new buildings but more essential for the to renovate existing building stock
- ▶ **Deep-renovation shall include aspects like IEQ improving the health standards of living conditions especially of vulnerable households.**(rec 33)

EPBD: Energy Performance Buildings Directive of 2018 revisited in 2022/23: some basic assumptions

- ▶ EU MS's should support EP upgrades that contribute to achieve a **healthy IEQ** (rec. 35)
- ▶ The EP Certificate of buildings should include both : data on EP **and IEQ** and recommendations to improve the EP and report about LCA GWP (rec. 47a)
- ▶ Better high performing EP buildings **should avoid overheating having improved IEQ conditions** and care about the micro climate around buildings (rec. 52)
- ▶ **Delegated acts are needed by 2027** on the cost optimality of MEP's towards Zero-emission Buildings, Life Cycle GWP, respecting at the same time minimum **Indoor Environmental Quality Standards**. (rec. 57)

EPBD: Energy Performance Buildings Directive of 2018 revisited in 2022/23: proposed articles (2023-03) related to IEQ

- ▶ Art 1.1 : Zero emission buildings by 2050 taking in to account amongst others: the requirements for IEQ
- ▶ Art 1.2 EPBD lays down : the IEQ performance of buildings
- ▶ Art 2.37 Digital Building Logbook: includes all relevant building data such as EP, Renovation Passport, SRI, LC GWP and IEQ, IEQ is also mentioned in further definitions
- ▶ Art 3 National Renovation Plans shall encompass: evidence energy savings, GHG reductions and wider benefits including IEQ
- ▶ Art 5.1 setting MEPs: MEP requirements shall take account of Health Indoor conditions based on optimal IEQ... (to be reviewed every 5 years)
- ▶ Optimal IEQ levels are also required for New and Deep Renovated buildings within 2 years after EPBD is in force, also taking climate change risks in to account

EPBD: Energy Performance Buildings Directive of 2018 revisited in 2022/23: proposed articles (2023-03) related to IEQ

- ▶ Art 10 Renovation Passports: shall comprise information on circularity as well wider benefits related to health, comfort, IEQ, safety, ...
- ▶ Art 11 Technical Building Systems: Require installation of measuring and control devices for monitoring and regulation IEQ at relevant unit level where technical and economical feasible (where measurable health benefits are taken in account) for the following buildings :
 - ▶ Zero Emission buildings
 - ▶ New buildings
 - ▶ Existing buildings major renovated
 - ▶ Non-residential buildings with H&C combined > 70 kW
 - ▶ Public buildings

The economic feasibility should take in account the measurable health benefits MS shall ensure that data on IEQ are to be included in the digital building logbook

- ▶ B&C systems required for non-res buildings with H&C >240 kW by 2024 and H&C>70 kW by 2029 capable to effective IEQ monitoring to ensure occupants Health and Safety.

EPBD art 11a: IEQ

- ▶ 11.1-2 MSs shall set requirements for **implementation of adequate IEQ standards** in order to maintain a healthy indoor climate. By 24 months after the EPBD is in force measurable indicators based to those in the Levels framework, these indicators shall include:
 - ▶ CO2
 - ▶ Temperature, thermal comfort
 - ▶ Relative humidity
 - ▶ Day-light levels
 - ▶ Ventilation rate, air change rate per hour
 - ▶ Acoustic comfort

EPBD art 11a: IEQ

- ▶ **Particulate matter of emissions of indoor sources and target pollutant limits from indoor sources, on VOCs, classified as carcinogenic, mutagenic, or toxic for reproduction according to Regulation (EC) No 1272/20081, including formaldehyde, shall be reported on the basis of the available data at product level, or direct measurement where available, of the relevant sources in relation to the indoor environment of the building.**
- ▶ **The EU Commission is empowered to adopt a delegated act to supplement this EPBD by establishing a methodology framework for calculating IEQ standards**
- ▶ **Member States shall ensure that new buildings and buildings undergoing major renovation comply with adequate indoor environmental quality standards.**

Art 13 SRI: Smart Readiness Indicator

- ▶ The Commission shall adopt delegated acts concerning an optional common Union scheme for rating the smart readiness of non-residential buildings.
- ▶ The rating shall be based on an assessment of the capabilities of a building or building unit to adapt its operation to the needs of the occupant, in particular concerning **indoor environmental quality** and the grid and to improve its energy efficiency and overall performance.
- ▶ Per 2025 for buildings with H&C > 290 kW and per 2030 for >70 kW.

EPBD: Energy Performance Buildings Directive of 2018 revisited in 2022/23: proposed articles (2023-03) related to IEQ

- ▶ Art 15a,f One stop shop for energy efficiency in buildings: Supporting awareness and incentives for regulating IEQ
- ▶ Art 16 Energy Performance Certificate (EPC) :
 - ▶ 16.4: ..shall include recommendations for the cost effective improvement of the energy performance to cost-optimal level and the reduction of whole life-cycle greenhouse gases emissions, **the improvement of indoor environmental quality of a building or building unit,**
 - ▶ 16.5: The recommendations included in the EPC shall be technically feasible for the specific building and shall provide an estimate for the energy savings and the reduction of operational greenhouse gas emissions over the expected service life of the building and **the improvement of indoor environmental quality performance indicators.**

ANNEX I: COMMON GENERAL FRAMEWORK FOR THE CALCULATION OF ENERGY PERFORMANCE OF BUILDING

- ▶ Member States shall describe their national calculation methodology based on Annex A of the key European standards on energy performance of buildings, namely EN ISO 52000-1, EN ISO 52003- 1, EN ISO 52010-1, EN ISO 52016-1, EN ISO 52018-1, **EN 16798-1**, EN 52120-1 and EN 17423 or superseding documents. This provision shall not constitute a legal codification of those standards.
- ▶ **EN 16798-1**: Energy performance of buildings - Ventilation for buildings - Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics -

EPBD Annex V: Template for EPC's

- ▶ In addition, the energy performance certificate shall include the following indicators
 - ▶
 - ▶ (j) the presence of fixed sensors that monitor the levels of indoor environmental quality;
 - ▶ (k) the presence of fixed controls that respond to the levels of indoor environmental quality
 - ▶ q) operational fine particulate matter (PM_{2.5}) emissions and performance indicators for the main categories of indoor environmental quality once the relevant provisions apply;