Delivering on the European Green Deal and Fit for 55

Addressing IEQ and inspection of ventilation systems: provisions in the EPBD Recast

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The EU Building Stock

EU building sector is one of the **largest energy consumers** in Europe, responsible for **more than one third of the energy-related emissions**.

About **24 billion m2** permanently occupied floor area, more than **70 % residential**

... **75 %** of the building stock **has poor energy performance** ...

Approx. **11%/year** of existing buildings undergo some level of **renovation,** while only about **1%/year concerns deeper energy renovation**

About **85 %** of existing EU dwellings were **built before 2000**, of which ...

... **more than 85 %** of current stock will **still be in place in 2050**

Focus Areas of the recast EPBD

Renovation

- Minimum Energy Performance Standards
- National trajectories for the progressive renovation of the residential building stock
- National Building Renovation Plans (BRPs)

Decarbonisation

- Introduction of zero-emission buildings as standard for new buildings
- Solar deployment in buildings
- Calculation of whole life cycle carbon
- Phasing out incentives for fossil fuels and new legal basis for national bans

Enabling framework

- Strengthened Energy Performance Certificates
- Renovation passports
- Sustainable finance & energy poverty
- One-stop-shops
- Deep renovation standard
- National energy performance databases

Modernisation & system integration

- Infrastructure for sustainable mobility
- Smart Readiness Indicator
- Indoor air quality: ventilation and other technical building systems
- Digitization, data access and exchange

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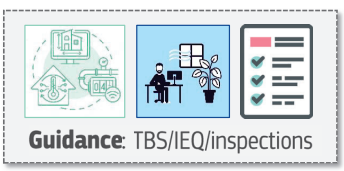
Some Background

- Good indoor environmental quality is essential for our **health and wellbeing**;
- Prices for technical systems that improve air quality have decreased, making **technical improvements more affordable** and authorities at EU, national and regional level have been increasing their efforts to provide an **appropriate regulatory framework**;
- Regular maintenance and inspection of HVAC systems by qualified personnel ensures optimal **environmental**, **safety and energy** performance, with multiple benefits for occupants;
- The Commission has been at work to **support Member States in transposing the EPBD**;
- Guidance documents are being prepared in cooperation with Member States & Stakeholders.



Guidance: TBS/IEQ/inspections

1 in 4

europeans live in buildings where indoor air quality falls below national standards.[2]

Source: BPIE, *Healthy Buildings Barometer*, 2024

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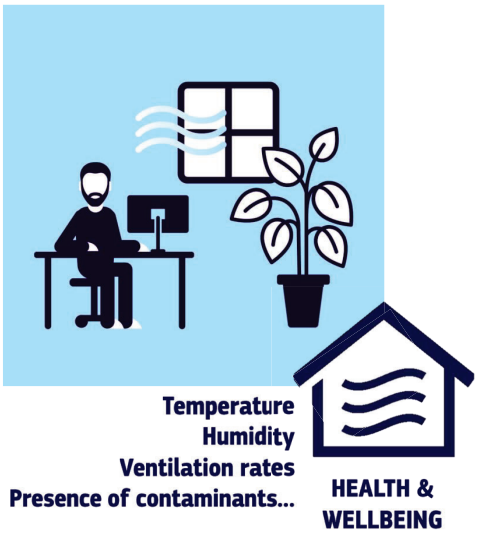
Provisions on Indoor Environmental quality (Articles 1, 2, 5, 7, 8, 13, 20, 23 + Annexes)

- Multiple references – Comprehensive approach
- Clear visibility in Article 1
- Definition of **Indoor Environmental Quality**
- **(Optimal) IEQ** to be addressed in **new & renovated buildings**
- Requirements for the implementation of **adequate IEQ standards** in operation
- Measuring & control devices for IAQ for non-residential buildings and integration of IEQ monitoring in BACS
- Visibility of IEQ in SRI, EPCs, Building Renovation Passports
- Policies and Measures addressing the improvement of IEQ in Building Renovation Plans



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Article 2(66), IEQ definition

Article 2(66) - 'indoor environmental quality'
means the result of an assessment of the conditions inside a building that **influence the health and wellbeing of its occupants**, based upon parameters such as those relating to the:
a) temperature,
b) humidity,
c) ventilation rate,
d) and presence of contaminants.

at least, **thermal comfort + IAQ**

- In the 2018 EPBD, there was a general reference to "indoor climate conditions"
- Member States will retain the competence for regulating **indoor environmental quality**, and they will need to define the indoor conditions to be maintained in buildings
- Member States can go beyond this definition and include other aspects in the transposition of the definition of IEQ, such as daylighting and acoustics (also in line with LEVEL(s))

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Addressing IEQ in the design phase Articles 5(1), 7(6), 8(3)

Article 5(1) - Minimum energy performance requirements shall take account of **optimal indoor environmental quality**, in order to avoid possible negative effects such as inadequate ventilation, as well as local conditions and the designated function and the age of the building.

Article 7(6) - Member States shall address, in relation to new buildings, the issues of **optimal indoor environmental quality** […]

Article 8(3) - Member States shall address, in relation to buildings undergoing major renovation, the issues of **indoor environmental quality** […]

- Minimum requirements for **indoor air quality and thermal comfort** are to be set in the regulation for new buildings and major renovations, if not yet available;
- For existing buildings undergoing major renovation, Member States may set less stringent requirements, based on cost-benefit considerations;
- Besides ventilation, also air filtration requirements for outdoor sources and control of indoor sources (appliances, materials…) can be recommended to control pollutant levels.

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Measuring and Control devices for IAQ Article 13(5)

5. Member States shall require non-residential zero-emission buildings to be equipped with measuring and control devices for the monitoring and regulation of indoor air quality. In existing non-residential buildings, the installation of such devices shall be required, where technically and economically feasible, when a building undergoes a major renovation.
Member States may require the installation of such devices in residential buildings.

- **Mandatory** in non-residential ZEBs and, when technically and economically feasible, in non-residential existing undergoing major renovation / **voluntary** in residential buildings;
- These devices **monitor and regulate the operation of the building and its technical systems** to ensure that they operate optimally and provide the required indoor air quality;
- Link with demand-controlled ventilation;
- The Guidance provides **relevant parameters and proxies** distinct by new and renovated building and, where relevant, per building type.

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Main IEQ elements in the Guidance

- Aim is to support Member States in **understanding and addressing the new provisions** and ensure **cost-effective implementation**.
- **Guidelines on design for indoor environmental quality**: example of relevant design indicators for new and existing buildings, differentiated by building types, provision of numerical ranges, based on relevant standards.
  - Main reference to EN 16798-1 standard
- **Guidelines on measuring and control of IAQ**: example of relevant proxies differentiated by building type, interpretation of the provisions.
- **Extreme outdoor conditions**: recalling measures to reduce indoor temperatures by design, definition of a heatwave, examples of indicators (for indoor comfort and outdoor air quality).

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Article 23 – Inspections Addressing TBSs and their performance

- Introduction of a **minimum frequency** depending on system dimensions and **extended scope** of buildings targeted by the provisions, compared to 2018 EPBD
  - **Every 5 years**, for heating, ventilation and air-conditioning systems or combinations thereof, with effective rated output >70 kW; **every 3 years**, for systems >290 kW.
- **New requirements and specifications for inspections**:
  - assessment of components of ventilation systems, air and water distribution systems…
  - assessment of feasibility of systems to operate under more efficient temperature settings
  - assessment of ventilation systems sizing and capability to optimize performance to use
  - basic assessment of the feasibility to reduce on-site use of fossil fuels
- New inspection scheme or alternative measures for the **verification of the compliance of the delivered construction and renovation works**.

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Extended scope and attention to Ventilation
Article 23(1)

Article 23(1)
Member States shall lay down the necessary measures to establish regular inspections of the accessible parts of heating systems, ventilation systems and air-conditioning systems, including any combination thereof, with an effective rated output of over 70 kW. The effective rating of the system shall be based on the sum of the rated output of the heat generators and cooling generators.

- The achievement of the **threshold of 70 kW triggers the inspection of the whole system**, based on the **sum of the rated output of the heat and cooling generators**
  - Increased number of buildings covered by inspections
- **Ventilation systems independent from the heating system**, where the ventilation system is independent from the heating both in terms of heat source and operation, are now in scope: i.e. extract-only systems, supply and extract systems (without pre-heating)
- Guidance will clarify the elements of flexibility for MSs in this regard and point to the relevant standards for the inspections (series EN 16798)

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Final Remarks and Next Steps

- Ensuring indoor air quality is a requirement linked with better living conditions and **minimising both short and long-term health risks in buildings**.
- Depending on the situation, it might be linked to an increase in energy consumption, but the alternative is an unhealthy indoor climate.
- Several **solutions for ensuring indoor environmental quality are already cost-efficient** (e.g., ventilation and heat recovery minimise thermal losses in winter to ensure adequate indoor air quality), even before considering the (monetizable) positive impacts linked to the improved health and well-being of building occupants.
- The Guidance package including the provisions on technical building systems, IEQ, and inspections is expected to be issued, together with most EPBD guidance documents, by the summer.

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