



Federation of European Heating, Ventilation and Air Conditioning Associations

## Implementing EPBD-IV

Indoor Environmental Quality (IEQ) and Decarbonisation (ZEB) through one legislative framework



# REHVA

## Federation of European Heating, Ventilation and Air Conditioning Associations

- Professional organisation founded in 1963
- Representing 120.000+ building services engineers from 24 countries

- **REHVA's mission:**  
to develop and disseminate economical, energy efficient, safe and healthy technology for mechanical services of building;

to facilitate knowledge exchange, support the development of related EU policies and their national level implementation.



# REHVA KNOWLEDGE DISSEMINATION

EVENTS



TOOLS



TRAININGS



PUBLICATIONS



COMMUNICATION





Federation of European Heating, Ventilation and  
Air Conditioning Associations

## Implementing EPBD-IV

Harm Valk

REHVA Vice-president / TVVL Netherlands



Chair EPB-standardisation committee Netherlands

Consultant - Nieman Group 



# EPBD-IV

## Energy Performance of Building Directive - Recast - EU 2024/1275

- Legislation to achieve a fully decarbonised building stock in 2050
- Directly related to EU's energy and climate goals
  - *Building envelope*
  - *Efficiency of building systems*
  - *Use of renewable energy*
  - *Energy performance certificates*
- Directive: EU addresses the member-states
- Transposed in national laws by 29<sup>th</sup> May 2026



# EPBD-IV - What's new?

## Energy Performance of Building Directive - Recast - EU 2024/1275

- ZEB: Zero Emission Buildings
- Replaces: nZEB (Nearly Zero Energy Buildings)
- National Building Renovation Plans
- Long term strategy for each member state
- BACS / IEQ / SRI
- Supporting vulnerable households
- One stop shops for technical assistance



# Why EPBD-IV?

EU Building stock



**40%**

The EU building sector is responsible for about 40% of energy use in Europe



**52%**

of natural gas use in the EU is attributable to buildings



**1/3**

of energy-related greenhouse gas emissions are caused by buildings

# Why EPBD-IV?

EU Building stock



**75%**

of the 24 billion m<sup>2</sup> of occupied floor area are buildings with poor energy performance



**1% / year**

is the weighted energy renovation rate, while approx. 11%/yr of existing buildings undergo some kind of renovation

**85%**



of existing dwellings were built before 2000 and more than 85% of current stock will still be in place in 2050

# Why EPBD-IV?

EU Building stock




**90%**

of the average life of a European is spent inside buildings



**1 in 4 Europeans**

live in buildings where indoor air quality falls below national standards

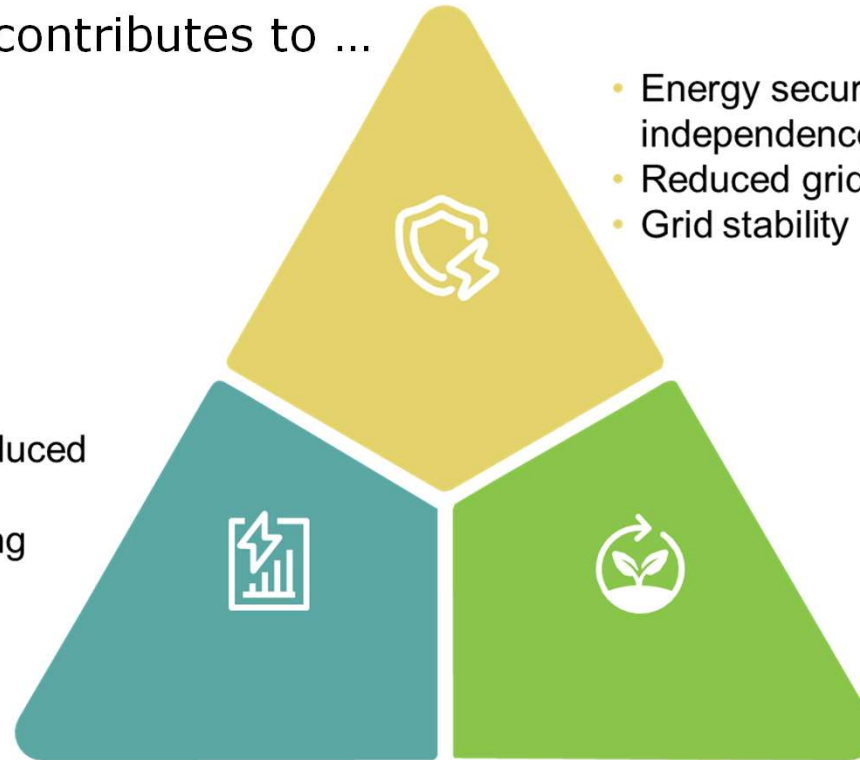
**10%** 

of European citizens are unable to keep their homes adequately warm

# Why EPBD-IV?

EPBD implementation contributes to ...

- Lower energy bills & reduced energy poverty
- Healthier living & working conditions
- New local jobs creation
- Affordable housing



- Energy security and independence
- Reduced grid investment needs
- Grid stability

- Lower energy consumption
- Reduced emissions in the building sector
- Climate, energy efficiency and renewable targets

# ZEB and IEQ - key in EPBD-IV

- ZEB = Zero Emission Buildings
  - From 'only' saving energy to preventing emissions
  - Phase out of stand-alone gasboilers and other fossile burners (date?)
- IEQ = Indoor Environmental Quality
  - More than 'just' IAQ (Indoor Air Quality)
- Coherence between ZEB and IEQ is meaningful
  - *'Energy savings is key, but not without good indoor conditions'*

# IEQ: Indoor Environmental Quality

- Definition (art. 2(66) EPBD)
- 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:
  - Temperature
  - Humidity
  - Ventilation rate
  - Presence of contaminants



# IEQ provisions in the EPBD



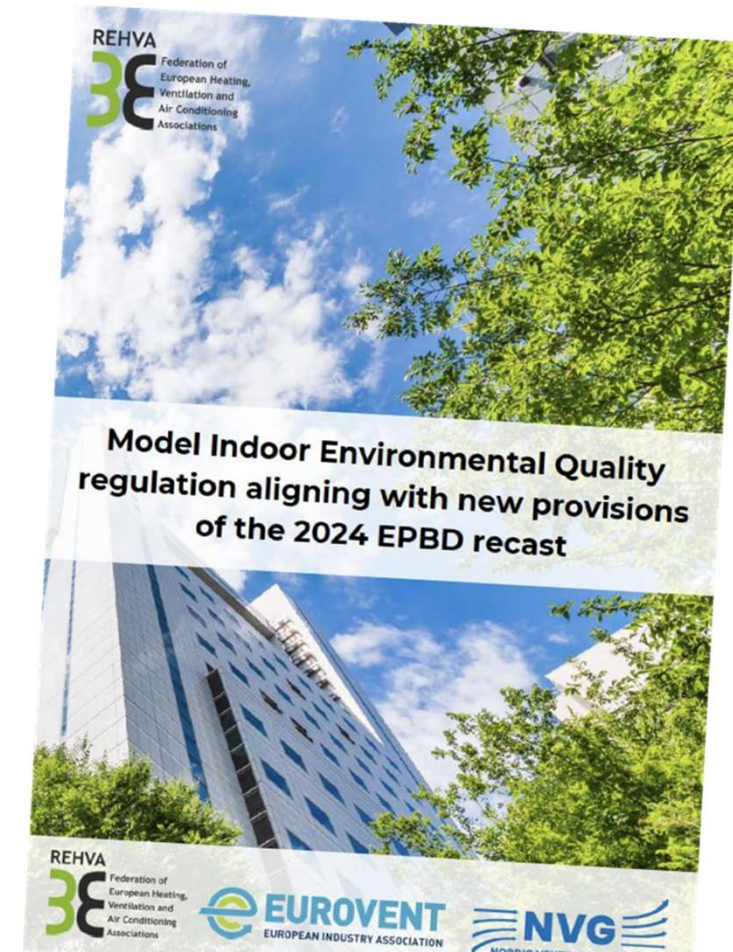
- Addressing optimal IEQ in the design phase
  - Art 5 (1): Minimum energy performance requirements shall take account of *optimal indoor environmental quality* ...
  - Art 7 (6): Member states shall address issues of IEQ for *new buildings*
  - Art 8 (3): Member states shall address issues of IEQ for *major renovations*
- Measuring and control devices for IEQ
  - New non-residential ZEB: measuring and control devices for IAQ
  - Non-residential major renovation: ...when technically and economically feasible
  - Optional: measuring and control devices for residential buildings (up to member state)

# REHVA Model IEQ Regulation

- Example of evidence based IEQ implementation
  - To help national implementation IEQ provisions
  - Developed by REHVA and Nordic Ventilation group
  - Example of evidence based IEQ  
=> useful minimum implementation
  - 100% compliant with EU Guidance documents

		Design	Commissioning	Monitoring	Inspections
Thermal Comfort	Operative temperature	X		(X)	
	Air temperature	X	X	X	X
	Air velocity	X			
Indoor air quality	Relative humidity	X		X	
	Ventilation Rate	X	X		X
	Carbon dioxide	X		X	
	PM2.5	X*		X*	
	Formaldehyde	X*			
	Nitrogen dioxide	X*			
	Radon	X*			
Daylighting	Carbon Monoxide	X*			
	Daylight provision	X			
	Illuminance	X	X		
Acoustics	Glare probability	X			
	Sound pressure level	X	X		
	Sound reverberation time	X	X		

[https://www.rehva.eu/fileadmin/user\\_upload/2024/IEQ\\_Guidance\\_2025.pdf](https://www.rehva.eu/fileadmin/user_upload/2024/IEQ_Guidance_2025.pdf)



# REHVA Model IEQ Regulation: assumptions

- Numeric values as examples
  - Following EU-Guidance to use ‘Category II’ (EN-16798-1)
  - Ensuring avoidance of negative health effects and sufficient thermal comfort and well-being occupants
- Limited tot thermal comfort, IAQ and noise of building services
  - Adjust with local weather file for energy simulations
  - Optional: sufficient daylight and acoustic comfort (other than building services)



# REHVA on EPBD and IEQ

- EU countries implement the EPBD into national law by 29 May 2026
  - The support package offers practical guidance to help EU countries
- The most technical guidance documents are supported with recent REHVA documents
  - REHVA 'Primary Energy and Operational CO<sub>2</sub> Indicator' document explains ZEB requirements, calculation principles and assessment boundary options
  - REHVA Model Indoor Environmental Quality Regulation takes a step forward by proposing regulatory texts serving as examples of evidence based IEQ useful minimum implementation

# Conclusions: ZEB and IEQ in EPBD

- The recast-EPBD addresses Indoor Environmental Quality
  - in the design phase; and
  - during operational life of building
- Ensuring IEQ standards and monitoring is important
  - cost- effective implementation is possible
- Renovating existing buildings is an unmissable opportunity
  - not only for more sustainable and energy-efficient buildings, but, also for a healthier and safer building stock



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*Feel welcome  
in a future REHVA-event!*

