

THE RECAST EPBD 2024: BARRIERS AND OPPORTUNITIES



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President

Mandate: 2022 - 2025



Apartment
Building

Corporate
Building

Industrial
Site

Hospital

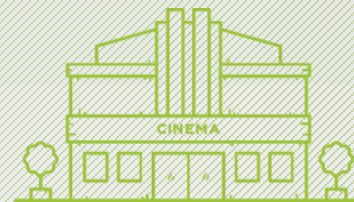
Mall

Hotel

Congress Center
& Institution

Cinema
Theater

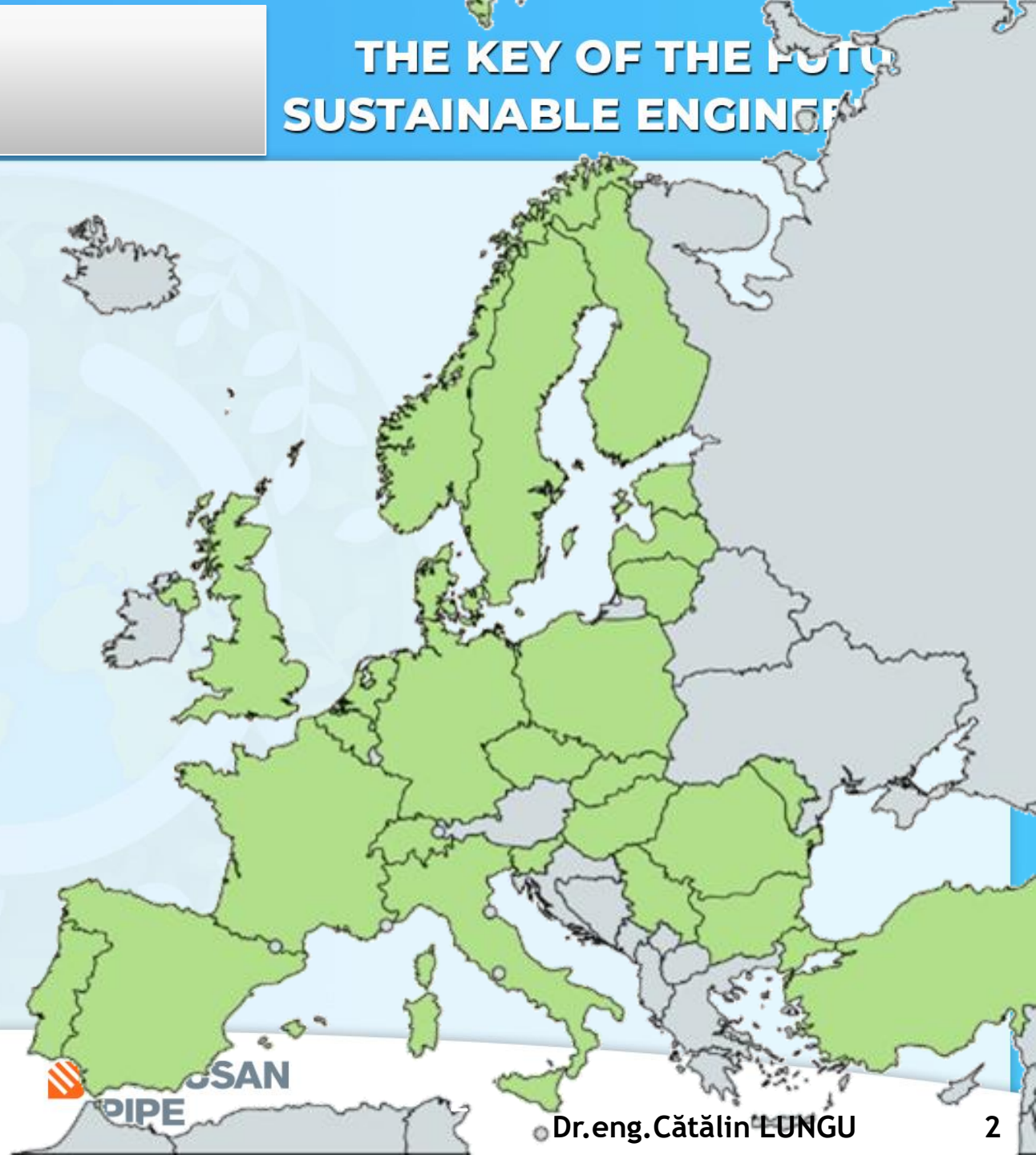
Airport



REHVA

Federation of European Heating, Ventilation and Air Conditioning Associations

- is a professional organisation
- founded in 1963
- representing 120.000+
- building services engineers
- from 26 countries



REHVA's KEY ACTIVITIES

SUPPORTING
INNOVATION



INVESTING IN
REHVA TOOLS



STRENGTHENING
REHVA NETWORK



EU POLICY MONITORING
& ADVOCACY



Buildings - the heart of our lives (general context)

THE KEY OF THE FUTURE: SUSTAINABLE ENGINEERING



We spend **up to 90%** of our lives in buildings



We were born, raised, educated



We eat, sleep, enjoy ourselves and work



We are healed or protected against natural phenomena

Buildings are essential for climate change mitigation and adaptation

Both energy-related operational emissions and emissions embedded in building materials must be drastically reduced

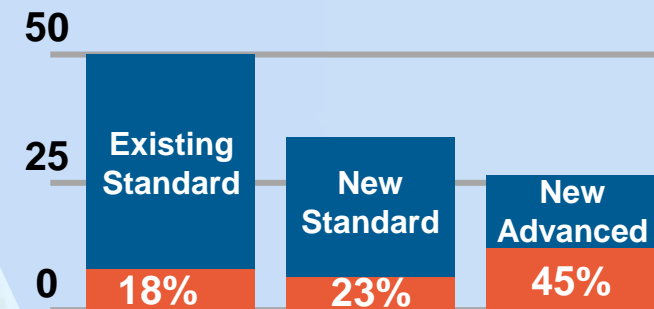
Total emissions: 37% of energy CO₂ in 2021 (20% of GHG global emission)

The global buildings surface should double by 2060.

The building sector should align with the objectives of the Paris Agreement

The building sector is key for our economy, social life and wellbeing.

Global trends in life cycle emissions of buildings, average kgCO₂eq/m²a



The equivalent of Paris is added in new building every 5 days

8.2% of the EU GDP

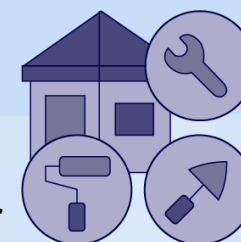
11-13% of the global GDP

10% of EU total employment

7% of global employment

13.4

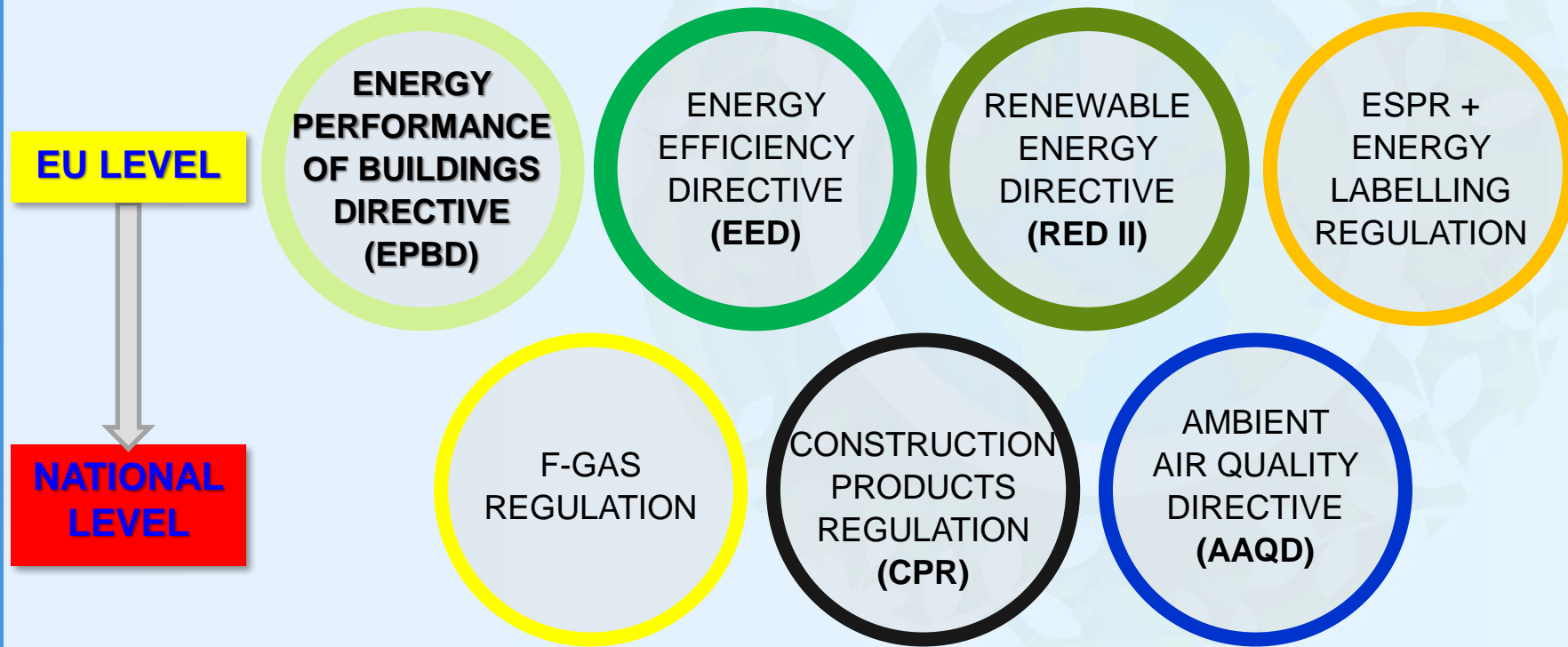
million people per year



200

million people per year

- **EU Green Deal (strategy) December 2019**
 - **March 2020** – Fit for 55 package
 - **October 2020** - Renovation Wave and Action Plan
 - **May 2022** - RePowerEU Action Plan



NEW EU GD 2030

Minimum 55% cut in greenhouse gas emissions compared to 1990 levels



At least a 42,5% share of renewables in final energy consumption

At least a 39% energy savings compared with the business-as-usual scenario



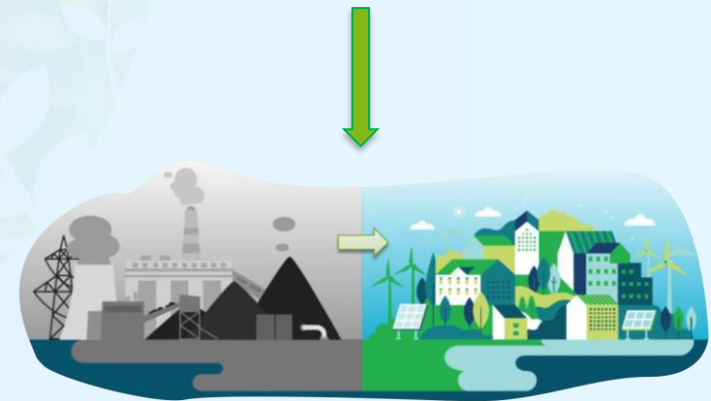
CBAM	Carbon Border Adjustment Mechanism	ENVI	Ensures imports into the European Union pay a price for their carbon along similar lines to production within the European Union
SCF	Climate Action Social Facility	ENVI	Mitigates social impacts of increasing carbon pricing for road transport & buildings using 25% of revenues from new separate Emissions Trading Scheme.
CO2 Cars	CO2 Standards for Cars and Vans	ENVI	Ensures new cars and vans produced after 2035 will in principle be zero-emission, while allowing trucks, ships and aviation a longer lead-in period
ESR	Effort Sharing Regulation	ENVI	Mandates nation targets for emissions from transport, buildings, agriculture, industry and waste not covered by the Emissions Trading System.
ETS	Emissions Trading System Directive	ENVI	Revisions to the EU's Emissions Trading System (ETS) and extension to transport & buildings, shipping and aviation
CORSIA	CORSIA		Carbon Offsetting and Reduction Scheme for International Aviation
LULUCF	Land Use, Land Use Change & Forestry Regulation	ENVI	Protects and restores forests & other ecosystems to compensate for emissions from fertiliser use and intensive livestock farming.
EED	Energy Efficiency Directive	ITRE	Mandates 'energy efficiency first' principle in major investment and policy decisions with a 36% reduction in primary energy (39% final energy) by 2030 compared to 1990
RED	Renewable Energy Directive	ITRE	A proposal to increase the 2030 renewable energy target to "at least 40%" from the current "at least 32%" compared to 1990
Methane	Methane Strategy	ITRE	Compulsory measurement, reporting, and verification for all energy related methane emissions, and reduce leaks and flaring
EPBD	Energy Performance in Buildings Directive	ITRE	Mandate deep renovations, double the annual renovation rate and ensure adequate financing
Gas R	Decarbonised gas markets Regulation	ITRE	Revised regulatory framework for further separation of energy supply and generation from the operation of transmission networks
Gas D	Revisions to the 2009 EU gas directive	ITRE	a role for renewable-based fuels for hard-to-abate sectors, such as heavy vehicle transport, aviation, steel and the fertiliser industry
AFIR	Alternative Fuels Infrastructure Directive	TRAN	Encourages roll-out of electric vehicle charging and other alternative fuels
Maritime	Fuel EU Maritime Regulation	TRAN	Requires ships to progressively switch to sustainable maritime fuel but allows use of liquefied natural gas (LNG) for at least the next two decades
ReFuelEU	RefuelEU Aviation Regulation	TRAN	Aims to increase the uptake of sustainable alternative fuels (SAFs) for flights within and departing EU
ETD	Energy Taxation Directive	ECON	Increased energy taxation based on the energy content of the energy products and electricity, and their environmental performance



- Commission proposal 15th of December 2021
- Council General Approach 25th of October 2022
- European Parliament plenary vote on 14th of March 2023
- Trialogues ended December 7th, 2023
- Approved by Parliament on March 12th, 2024
- Approved by Council on April 12th, 2024
- **Published in the Official Journal on April, 24th**
- **Entered already into force (May 14th, 2024)**

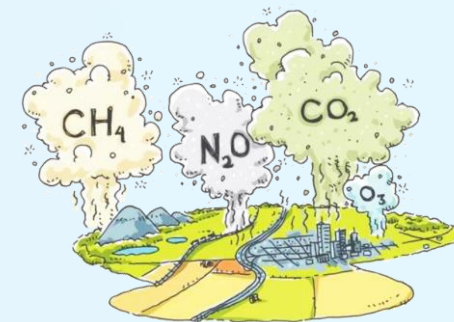
Major objectives of the EPBD²⁰²⁴

- 1 Contribute to reducing buildings' GHG emissions and final energy consumption by 2030
- 2 Provide a long-term vision for buildings and ensure an adequate contribution to achieving climate neutrality in 2050



Article 1: Objectives & new (minimum) requirements

- calculation and disclosure of the life-cycle GWP of buildings
- national building renovation plans
- solar energy in buildings
- renovation passports
- sustainable mobility infrastructure in and adjacent to buildings
- smart buildings (SRI)
- indoor environmental quality performance of buildings
- regular inspection of building systems (HVAC)



Article 2: Definitions (66)

‘ZERO-EMISSION BUILDING’ - very high energy performance, requiring zero or a very low amount of energy, producing zero on-site carbon emissions from fossil fuels and producing zero or a very low amount of operational GHG emissions

‘DEEP RENOVATION’ - a renovation in line with the energy efficiency first principle and which focuses on essential building elements; it transforms a building or building unit:

- (a) before 1 January 2030, into a NZEB;
- (b) as of 1 January 2030, into a ZEB;



Article 5: Setting Minimum Energy Performance requirements

- minimum energy performance requirements are set with a view to at least achieving cost-optimal levels and, where relevant, more stringent reference values such as NZEB requirements and ZEB requirements.
- the requirements 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.

Exclusions - Heritage buildings / Defence installations / Holiday homes < 4 months per year / Small dwellings < 50m² / Places of worship and for religious activities / Agriculture buildings

Article 6: Calculation of cost-optimal levels of min EP requirements

Commission is empowered to adopt delegated acts to supplement this Directive concerning a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements.

By **30 June 2025**, the Commission shall revise the comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements in new buildings and existing buildings undergoing major renovation and for individual building elements, which are in line with the national pathways set out in the national energy and climate plans.

Member States shall calculate cost-optimal levels of minimum energy performance requirements using the comparative methodology framework established...Member States may take into account the life-cycle GWP (revised MS reports ready by **30 June 2028**).

Article 7: (1of2) New Buildings

Member States shall ensure that new buildings are ZEBs in accordance with Article 11:

- (a) as of 1 January 2028, new buildings owned by public bodies; and
- (b) as of 1 January 2030, all new buildings.



Member States shall ensure that the life-cycle GWP is calculated and disclosed through the EPC of the building:

- (a) as of 1 January 2028, for all new buildings with a useful floor area $>1000 \text{ m}^2$;
- (b) as of 1 January 2030, for all new buildings.

Article 7: (2of2) New Buildings

By **31 December 2025** the Commission shall adopt a delegated act to supplement this Directive by setting out an **EU framework for the national calculation methodology of life-cycle GWP**.



By **1 January 2027** Member States shall publish a roadmap detailing the introduction of limit values on the total cumulative life-cycle GWP of all new buildings and set targets for new buildings from 2030, considering a progressive downward trend, as well as maximum limit values, detailed for different climatic zones and building typologies.

Article 8: Existing Buildings

- take the necessary measures to ensure that when buildings undergo major renovation, the energy performance of the building or the renovated part thereof is upgraded in order to meet minimum energy performance requirements set in accordance with Article 5 in so far as that is technically, functionally and economically feasible.
- encourage, in relation to buildings undergoing major renovation, high-efficiency alternative systems, in so far as that is technically, functionally and economically feasible.
- address, in relation to buildings undergoing major renovation, the issues of indoor environmental quality, adaptation to climate change, fire safety, risks related to intense seismic activity, the removal of hazardous substances including asbestos and accessibility for persons with disabilities.

Article 9: MEPS for NRB and progressive renovation of residential

Non-Residential, requirement to renovate
2030 worst 16% (of buildings)
2033 worst 26% (of buildings)
2050 zero-emission

Residential, requirement to save energy
2030 16% energy reduction
2033 20-22% energy reduction
2050 zero-emission

Member States shall establish specific timelines for the buildings referred to in this paragraph to comply with lower maximum energy performance thresholds by 2040 and 2050, in line with the pathway for transforming the national building stock into zero-emission buildings.

Member States shall ensure that at least 55% of the decrease of the average primary energy use is achieved through the renovation of worst-performing residential buildings (43%), the ‘*worst first*’ principle.

Article 10: Solar Energy in Buildings

Deployment of solar systems if technically suitable and economically and functionally feasible, taking into account structural integrity, green roofs, and attic and roof insulation, where appropriate.



Article 11: (1of2) Zero-Emission Buildings

A ZEB shall not cause any on-site carbon emissions from fossil fuels.

A ZEB shall offer the capacity to react to external signals and adapt its energy use, generation or storage, where economically and technically feasible.

MSs shall take the necessary measures to ensure that the energy demand of a zero-emission building complies with a maximum threshold (set ...with a view to achieving at least the cost-optimal levels established in the most recent national cost-optimal report pursuant to Article 6; the maximum threshold will be revised every time that the cost-optimal levels are revised).

$$EP_{tot,max} < 0.9 \cdot EP_{tot,max,NZEB}$$

The maximum threshold shall be at least 10% lower than the threshold for total primary energy use established at Member State level for NZEB on 28 May 2024.

Article 11: (2of2) Zero-Emission Buildings

The total annual primary energy use of a new or renovated ZEBs covered by:

- (a) energy from renewable sources generated onsite or nearby, fulfilling the criteria of Article 7 of Directive (EU) 2018/2001 [amended RED];
- (b) energy from renewable sources provided from a renewable energy community within the meaning of Article 22 of Directive (EU) 2018/2001 [amended RED];
- (c) energy from an efficient district heating and cooling system in accordance with Article 24(1) of Directive (EU) 2023/1791 [recast EED]; or
- (d) *energy from carbon free sources*.

Where it is technically and economically not feasible to fulfil the requirements under this paragraph, the total annual primary energy use may also be covered by other energy from the grid complying with criteria established at national level.

Article 13: Technical Building Systems

Member States shall, for the purpose of optimising the energy use of technical building systems, set system requirements, using energy saving technologies, in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the technical building systems, and, where appropriate, hydronic balancing, which are installed in new or existing buildings.

When setting up the requirements, Member States shall take account of design conditions and typical or average operating conditions.

Member States shall set requirements for the implementation of adequate indoor environmental quality standards in buildings in order to maintain a healthy indoor climate.

Member States shall require non-residential ZEBs to be equipped with measuring and control devices for the monitoring and regulation of indoor air quality.

Member States shall promote energy storage for renewable energy in buildings

Member States shall strive to replace stand-alone boilers powered by fossil fuels.

Article 14: Infrastructure for sustainable mobility

With regard to new non-residential buildings with >5 car parking spaces & non-residential buildings undergoing major renovation,

- (a) the installation of at least one recharging point for every five parking spaces;
- (b) the installation of pre-cabling for at least 50% of car parking spaces and ducting, namely conduits for electric cables, for the remaining parking spaces, to enable the installation at a later stage of recharging points for electric vehicles, electrically power-assisted cycles and other L-category vehicles types; and
- (c) **bicycle** parking spaces representing at least 15% of average or 10% of total user capacity of non-residential buildings, taking into account the space required also for bicycles with larger dimensions than standard bicycles;

With regard to non-residential buildings with > 20 parking spaces, Member States shall ensure by 1 January 2027:

- (a) the installation of at least one recharging point for every ten parking spaces, or
- (b) ducting, namely conduits for electric cables, for at least 50% of the parking spaces to enable the installation at a later stage of recharging points for electric vehicles; and
- (c) bicycle parking spaces representing at least 15% of average or 10% of total user capacity of the building and with space required also for bicycles with larger dimensions than standard bicycles.

In case of buildings owned or occupied by public bodies, Member States shall ensure pre-cabling for at least one in 1 parking spaces by 1 January 2033.

Article 15: Smart readiness of buildings

The Commission shall adopt delegated *acts* concerning an optional common Union scheme for rating the smart readiness of 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.



Article 16: Data Exchange

Member States shall ensure that the building owners, tenants and managers can have direct access to their building systems' data. Upon their consent, the access or data shall be made available to a third party, subject to the existing applicable rules and agreements. Member States shall facilitate the full interoperability of services and of data exchange within the Union.

Building systems data shall include at least all readily available data related to the energy performance of building elements, the energy performance of building services, the projected lifespan of the heating systems, where available, building automation and control systems, meters, measuring and control devices and charging points for e-mobility and be linked, where available, to the digital building logbook.

Article 17: Financial incentives, skills and market barriers

Member States shall provide appropriate financing, support measures and other instruments able to address market barriers in order to deliver the necessary investments identified in their national building renovation plan to transform their building stock into zero-emission buildings by 2050.

Member States shall ensure that application and procedures for public financing are simple and streamlined in order to facilitate the access to financing especially for households.

Member States shall promote ... energy efficiency loans and mortgages for building renovation, energy performance contracting, pay-as-you-save financial schemes, fiscal incentives, ... reduced tax rates on renovation works and materials, on-tax schemes, on-bill schemes, guarantee funds, funds targeting deep renovations, funds targeting renovations with a significant minimum threshold of targeted energy savings and mortgage portfolio standards.

Article 18: One-stop-shops for energy performance of buildings

Member States shall, in cooperation with competent authorities, and, where appropriate, private stakeholders, ensure the establishment and the operation of technical assistance facilities, including through inclusive one-stop-shops for energy performance of buildings, targeting all actors involved in building renovations, including home owners and administrative, financial and economic actors, including microenterprises and small- and medium-sized enterprises.

Member States shall ensure that technical assistance facilities are available across their territory by establishing at least one one-stop-shop:

- (a) per 80 000 inhabitants, or
- (b) per region, or
- (c) in areas where the average age of the building stock is above the national average, or
- (d) in areas where Member States aim to implement integrated district renovation programmes, or
- (e) in a location that can be reached within less than 90 minutes of average travel distance.

Articles 19-22: Energy Performance Certificates

Member States shall lay down the necessary MEPS, nZEB requirements and ZEB requirements.

A+ energy performance class

Member States may define an A+ energy performance class corresponding to buildings with a maximum threshold for energy demand which is **at least 20% < the maximum threshold for ZEBs**, and which generates more renewable energy on-site annually than its total annual primary energy demand.

For existing buildings renovated to A+ class, Member States shall ensure that the life-cycle GWP is estimated and disclosed through the energy performance certificate of the building.

BARRIERS before & after implementation

1. Financial Constraints (upfront costs for renovation and new)
2. Regulatory Complexity (5 delegated acts + other EU directives)
3. Technical Challenges (fossil fuel boilers & GWP vs EPDs)
4. Awareness and Resistance to Change (paradigm shift)
5. Historical Buildings (keeping by tailoring)



OPPORTUNITIES after implementation

1. Energy Savings (less €43 bln spent) and Reduced Emissions
2. Innovation (EU projects) and green jobs (+1,2mil)
3. Improved Indoor Environment
4. Economic Stimulus (GDP +1%)
5. EU commun assessment procedures and definitions of EP, GWP, IEQ and IAQ, SRI, trainings, certification schemes for skills



HARMONISATION



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