

DIRECTIVE [...] OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of [...]

on the energy performance of buildings

(recast)

[...]

Article 1

Subject matter

1. This Directive promotes the improvement of the energy performance of buildings and the reduction of greenhouse gas emissions from buildings within the Union, taking into account outdoor climatic and local conditions, indoor climate requirements and cost-effectiveness.

2. This Directive lays down requirements as regards:

(a) the common general framework for a methodology for calculating the integrated energy performance of buildings and building units;

(b) the application of minimum requirements to the energy performance of new buildings and new building units;

(c) the application of minimum requirements to the energy performance of:

(i) existing buildings and building units ~~and building elements~~ that are subject to major renovation;

(ii) building elements that form part of the building envelope and that have a significant impact on the energy performance of the building envelope when they are retrofitted or replaced; and

(iii) technical building systems whenever they are installed, replaced or upgraded;

(ca) the application of minimum energy performance standards to existing buildings and existing building units;

(cb) building renovation passports;

(cc) national building renovation action plans;

(cd) sustainable mobility infrastructure in and adjacent to buildings;

(ce) smart buildings;

~~(d) national plans for increasing the number of nearly zero energy buildings;~~

(e) energy performance certification of buildings or building units;

(f) regular inspection of heating, ventilation and air-conditioning systems in buildings; and

(g) independent control systems for energy performance certificates and inspection reports.

3. The requirements laid down in this Directive are minimum requirements and shall not prevent any Member State from maintaining or introducing more stringent measures. Such measures shall be compatible with the Treaty on the Functioning of the European Union. They shall be notified to the Commission.

Article 2

Definitions

For the purpose of this Directive, the following definitions shall apply:

1. 'building' means a roofed construction having walls, for which energy is used to condition the indoor climate;

1a. 'zero-emission building' means a building that has a very high energy performance, as determined in accordance with Annex I, and complies with the benchmarks set out in Annex III. The very low amount of energy still required has to be fully covered by energy from renewable sources produced on-site;

2. 'nearly zero-energy building' means a building that has a very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;

↓ 2018/844 Art. 1.1(a)

3. 'technical building system' means technical equipment for space heating, space cooling, ventilation, domestic hot water, built-in lighting, building automation and control, on-site electricity generation, or a combination thereof, including those systems using energy from renewable sources, of a building or building unit;

↓ 2018/844 Art. 1.1(b)

3a. 'building automation and control system' means a system comprising all products, software and engineering services that can support energy efficient, economical and safe operation of technical building systems through automatic controls and by facilitating the manual management of those technical building systems;

4. 'energy performance of a building' means the calculated ~~or measured~~ amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting;
5. 'primary energy' means energy from renewable and non-renewable sources which has not undergone any conversion or transformation process;
 - 5a. 'non-renewable primary energy factor' means non-renewable primary energy for a given energy carrier, including the delivered energy and the considered energy overheads of delivery to the points of use, divided by the delivered energy;
 - 5b. 'renewable primary energy factor' means renewable primary energy for an onsite or a given distant or nearby energy carrier, including the delivered energy and the considered energy overheads of delivery to the points of use, divided by the delivered energy;
 - 5c. 'total primary energy factor' means sum of renewable and non-renewable primary energy factors for a given energy carrier;
6. 'energy from renewable sources' means energy from renewable non-fossil sources, namely wind, solar (solar thermal and solar photovoltaic), ~~aerothermal~~, and geothermal energy, ~~hydrothermal~~ ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogases;
7. 'building envelope' means the integrated elements of a building which separate its interior from the outdoor environment;
8. 'building unit' means a section, floor or apartment within a building which is designed or altered to be used separately;
9. 'building element' means a technical building system or an element of the building envelope;
 - 9a. 'building renovation passport' means a document that provides a tailored roadmap for the renovation of a specific building in several steps that will significantly improve its energy performance;
 - 9a. 'deep renovation' means a renovation which transforms a building into a zero-emission building, not including renovations which lead to a reduction in energy demand of less than 30%;
 - 9b. 'staged deep renovation' means a deep renovation carried out in several steps, following the steps set out in a building renovation passport in accordance with Article 2b;
10. 'major renovation' means the renovation of a building where:
 - (a) the total cost of the renovation relating to the building envelope or the technical building systems is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated; or

(b) more than 25 % of the surface of the building envelope undergoes renovation;

Member States may choose to apply option (a) or (b).

11. 'European standard' means a standard adopted by the European Committee for Standardisation, the European Committee for Electrotechnical Standardisation or the European Telecommunications Standards Institute and made available for public use;

12. 'energy performance certificate' means a certificate recognised by a Member State or by a legal person designated by it, which indicates the energy performance of a building or building unit, calculated according to a methodology adopted in accordance with Article 3;

13. 'cogeneration' means simultaneous generation in one process of thermal energy and electrical ~~and~~ or mechanical energy;

14. 'cost-optimal level' means the energy performance level which leads to the lowest cost during the estimated economic lifecycle, where:

(a) the lowest cost is determined taking into account:

i) the category and use of building concerned;

ii) energy-related investment costs based on official forecasts;

iii) maintenance and operating costs (including energy costs, taking into account the cost of greenhouse gas allowances);

iv) environmental externalities of energy use;

v) earnings from energy produced on-site, where applicable;

vi) disposal costs, where applicable;

(b) the estimated economic lifecycle is determined by each Member State. It refers to the remaining estimated economic lifecycle of a building where energy performance requirements are set for the building as a whole, or to the estimated economic lifecycle of a building element where energy performance requirements are set for building elements.

The cost-optimal level shall lie within the range of performance levels where the cost benefit analysis calculated over the estimated economic lifecycle is positive;

14a. 'recharging point' means a recharging point as defined in Article 2(41) [AFIR];

14b. 'smart charging' means smart charging as defined in Article 2(14l) [amended RED];

14c. 'regulatory authority' means regulatory authority as defined in Article 2(14m) [amended RED];

14d. 'bidirectional charging' means bidirectional charging as defined in Article 2(14n) [amended RED];

15. 'air-conditioning system' means a combination of the components required to provide a form of indoor air treatment, by which temperature is controlled or can be lowered;

↓ 2018/844 Art. 1.1(c)

15a. 'heating system' means a combination of the components required to provide a form of indoor air treatment, by which the temperature is increased;

15b. 'heat generator' means the part of a heating system that generates useful heat, using one or more of the following processes:

(a) the combustion of fuels in, for example, a boiler;

(b) the Joule effect, taking place in the heating elements of an electric resistance heating system;

(c) capturing heat from ambient air, ventilation exhaust air, or a water or ground heat source using a heat pump;

15c. 'energy performance contracting' means energy performance contracting as defined in point (29 27) of Article 2 of [revised Energy Efficiency Directive] Directive 2012/27/EU of the European Parliament and of the Council⁴;

↓ 2010/31/EU

16. 'boiler' means the combined boiler body-burner unit, designed to transmit to fluids the heat released from burning;

17. 'effective rated output' means the maximum calorific output, expressed in kW, specified and guaranteed by the manufacturer as being deliverable during continuous operation while complying with the useful efficiency indicated by the manufacturer;

18. 'heat pump' means a machine, a device or installation that transfers heat from/to natural surroundings such as air, water or ground to or from buildings, for the purpose of providing heating, cooling or domestic hot water or industrial applications by reversing the natural flow of heat such that it flows from a lower to a higher temperature. For reversible heat pumps, it may also move heat from the building to the natural surroundings;

19. 'district heating' or 'district cooling' means the distribution of thermal energy in the form of steam, hot water or chilled liquids, from a central source of production through a network to multiple buildings or sites, for the use of space or process heating or cooling;

20. 'useful floor area' means the area of the floor of a building needed as parameter to quantify specific conditions of use that are expressed per unit of floor area and for

the application of the simplifications and the zoning and (re-)allocation rules [or alternatively: as defined in EN ISO 52000-1];

21. ‘reference floor area’ means the floor area used as reference size for the assessment of the energy performance of a building, calculated as the sum of the useful floor areas of the spaces within the building envelope specified for the energy performance assessment;

22. ‘assessment boundary’ means boundary where the delivered and exported energy are measured or calculated;

23. ‘on-site’ means the premises and the parcel of land on which the building is located and the building itself;

24. ‘EPBD services’ means the services, such as heating, cooling, ventilation, domestic hot water and lighting and others for which the energy use is taken into account in the energy performance of buildings;

25. ‘energy needs’ means the energy to be delivered to, or extracted from, a conditioned space to maintain the intended space conditions during a given period of time disregarding the technical building system inefficiencies;

26. ‘energy use’ means energy input to a technical system providing a EPBD-service intended to satisfy an energy need;

27. ‘self-used’ means part of on-site or nearby produced renewable energy used by on-site technical systems for EPBD services;

28. ‘other building uses’ means energy used on-site for uses other than EPBD services. This can include: appliances, miscellaneous and ancillary loads or electro-mobility charging points;

29. ‘calculation interval’ means the discrete time interval used for the calculation of the energy performance;

30. ‘delivered energy’ means energy, expressed per energy carrier, supplied to the technical building systems through the assessment boundary, to satisfy the uses taken into account or to produce the exported energy;

31. ‘exported energy’ means, expressed per energy carrier and per primary energy factor, is the proportion of the renewable energy that is exported to the energy grid instead of being used on site for self-use or for other on-site uses.

↓ 2018/844 Art. 1.1(d)

~~20. ‘micro isolated system’ means micro isolated system as defined in point 27 of Article 2 of Directive 2009/72/EC of the European Parliament and of the Council. Article 2a~~

National building renovation action plan Long term renovation strategy

1. Each Member State shall establish a ~~long-term renovation strategy~~ building renovation action plan to ~~support~~ promote the renovation of the national stock of residential and non-residential buildings, both public and private, into a highly energy efficient and decarbonised building stock by 2050, ~~facilitating the cost-effective transformation of~~ with the objective to transform existing buildings into ~~nearly zero-energy~~ emission buildings.

Each ~~long-term renovation strategy~~ building renovation action plan shall encompass:

- (a) an overview of the national building stock for different building types, construction periods and climatic zone, based, as appropriate, on statistical sampling and the national database for energy performance certificates pursuant to Article 13a, and additional information on at least the following elements:
 - (i) the annual energy renovation rate;
 - (ii) the primary and final energy consumption of the national building stock;
 - (iii) the operational greenhouse gas emissions from the building sector;
 - (iv) the energy performance of buildings based on the Energy Performance Certificates;
 - (v) identification of the share of worst-performing buildings;
 - (vi) consumption trends for different types of energy sources, including renewable energy sources;
 - (vii) an overview of market barriers and market failures, including split incentives;
 - (viii) the capacities in the construction and energy efficiency sectors and the adequacy of those capacities to meet the building renovation targets pursuant to subpoint i of point b;
- (b) a roadmap with domestically established targets and measurable progress indicators [for different building types], with a view to the 2050 climate neutrality goal, in order to ensure a highly energy efficient and decarbonised national building stock ~~and the transformation of existing buildings into zero-emission buildings~~. The roadmap shall include:
 - (i) national targets for 2030, 2040 and 2050 as regards the expected share of renovated buildings, the primary and final energy consumption of the national building stock and its operational greenhouse gas emission reductions;
 - (ii) an evidence-based estimate of expected energy savings and wider benefits, such as those related to health, safety, jobs, GDP growth and air quality;
 - (iii) estimations for the contribution of the building renovation action plans to achieving the Union's energy efficiency targets in accordance with [recast EED], the Union's renewable energy targets, including the indicative target for the share of energy from renewable sources in the building sector in

accordance with [amended RED], and the Union's 2030 climate target and 2050 climate neutrality goal in accordance with the European Climate Law.

- (c) an overview of implemented and planned policies and measures, supporting the implementation of the roadmap pursuant to (b), on the following elements:
- (i) the identification of cost-effective approaches to renovation relevant to the building type and climatic zone, considering potential relevant trigger points, where applicable, in the lifecycle of the building;
 - (ii) the promotion of deep renovation of buildings towards zero-emission levels, including staged deep renovation;
 - (iii) the creation of one-stop-shops or similar mechanisms for the provision of technical, administrative and financial advice and assistance;
 - ~~(iv) for example by introducing an optional scheme for the promotion of building renovation passport schemes pursuant to Article 2b;~~
 - (iv) the establishment of national minimum energy performance standards pursuant to Article 7a and other policies and actions to target the worst performing segments of the national building stock; and
 - ~~(v) an outline of relevant national actions that contribute to~~ the alleviation of energy poverty, including those pursuant to Article 22 [revised EED], and to housing affordability;
 - ~~(vi) policies and actions to target~~ the improvement of all public buildings, including those pursuant to Articles 5, 6 and 7 of the [revised EED];
 - (vii) the increase of the renewable share in buildings in line with the indicative target for the share of energy from renewable sources in the building sector set in Article 15a(1) of [amended RED];
 - (viii) the phase out of fossil fuels in heating and cooling;
 - (x) the decarbonisation of heating and cooling, including through district heating and cooling networks;
 - (ix) the reduction of whole life-cycle greenhouse gas emissions in the construction, renovation, operation and end of life of buildings;
 - (xi) the promotion of smart technologies, infrastructure for sustainable mobility in buildings and well-connected buildings and communities;
 - (xii) addressing the gaps in capacities, skills and education in the construction sector and energy efficiency sector;
 - (xiii) the increase of climate resilience of buildings;
 - (xiv) awareness campaigns and advisory tools;
- (d) an outline of the investment needs, the financing measures, including Union support and national public financing measures with a breakdown of the planned

use of grants, technical assistance, financial instruments and combined options, the administrative resources, as well as an indicative estimation of the leverage factors for private financing, toward the achievement of the building renovation targets.

2. To support the mobilisation of investments into the renovation needed to achieve the goals referred to in paragraph 1, Member States shall facilitate access to appropriate mechanisms for:

- (a) the aggregation of projects, including by investment platforms, technical assistance facilities ~~or groups~~, and by consortia of small and medium-sized enterprises, to enable investor access as well as packaged solutions for potential clients;
- (b) ~~the reduction of~~ conveying the ~~perceived~~ lower credit risk of energy efficiency operations for investors and the private sector;
- (c) the use of public funding to leverage additional private-sector investment or address specific market failures;
- (d) guiding investments into a decarbonised ~~energy-efficient~~ public building stock, including by promoting use of energy performance contracting where relevant, in line with Eurostat guidance; and
- (e) accessible and transparent advisory tools, such as one-stop-shops for consumers and energy advisory services, on relevant ~~energy efficiency~~ renovations and financing instruments.

Member States shall present in the national building renovation action plans actions towards the above mechanisms.³ The Commission shall collect and disseminate, ~~at least to public authorities,~~ best practices on successful public and private financing schemes and incentives for ~~energy efficiency~~ renovation and other policies and measures as well as information on schemes for the aggregation of small-scale energy efficiency renovation projects. The Commission shall identify and disseminate best practices on financial incentives to renovate from a consumer perspective taking into account cost-efficiency differences between Member States.

4. To support the development of its ~~long-term renovation strategy~~ building renovation action plan, each Member State shall carry out a public consultation on its draft building renovation action plan ~~long-term renovation strategy~~ prior to submitting it to the Commission. Each Member State shall annex a summary of the results of its public consultation to its ~~long-term renovation strategy~~ draft building renovation action plan.

~~Each Member State shall establish the modalities for consultation in an inclusive way during the implementation of its long-term renovation strategy.~~

5. By 1 January 2025 and subsequently every five years thereafter, Member States shall prepare and submit to the Commission a draft of the national building renovation action plan, using the template in Annex II.

6. The Commission shall assess the national draft building renovation action plans. It shall assess in particular whether

- (a) the level of ambition of the domestically established targets is sufficient and in line with the national commitments on climate and energy;
- (b) the policies and actions are sufficient to achieve the domestically established targets;
- (c) the allocation of budgetary and administrative resources is sufficient for the implementation of the plan;
- (d) the plans comply with the requirements of this Article and the template in Annex II.

After consulting the Committee established by Article 26, the Commission may issue country-specific recommendations to Member States no later than six months after the submission of the Member State's building renovation action plan.

7. Each Member State shall take due account of any recommendations from the Commission in its building renovation action plan. If the Member State concerned does not address a recommendation or a substantial part thereof, that Member State shall provide and make public its reasons.

8. By 1 January 2026 and subsequently every five years, Member States shall submit their national building renovation action plans to the Commission, using the template in Annex II.

9. Each Member State shall annex the details of the implementation of its most recent ~~long-term renovation strategy~~ building renovation action plan to its ~~long-term renovation strategy~~ building renovation action plan, including on the planned policies and actions. Where applicable, each Member State shall state whether its national targets have been achieved.

10. Each Member State may use its ~~long-term renovation strategy~~ building renovation action plan to address fire safety and risks related to intense seismic activity affecting energy efficiency renovations and the lifetime of buildings.

Article 2b

Building renovation passport

1. By [31 December 2023], the Commission shall adopt delegated acts in accordance with Article 23 supplementing this Directive by establishing a common European framework for building renovation passports, based on the criteria set out in paragraph 2.

By 31 December 2024, Member States shall introduce a scheme of building renovation passports based on the common framework established in accordance with paragraph 1.

2. The building renovation passport shall be issued by a qualified and accredited expert, following an on-site visit. It shall comprise a renovation roadmap indicating a sequence of renovation steps building upon each other, with the objective to transform the building into a zero-emission building by 2050 at the latest. It shall indicate the expected benefits in terms of energy savings, savings on energy bills and greenhouse emission reductions as well as wider benefits related to health and comfort. It shall contain information about potential financial and technical support.

Article 3

Adoption of a methodology for calculating the energy performance of buildings

Member States shall apply a methodology for calculating the energy performance of buildings in accordance with the common general framework set out in Annex I.

This methodology shall be adopted at national or regional level.

Article 4

Setting of minimum energy performance requirements

1. Member States shall take the necessary measures to ensure that minimum energy performance requirements for buildings or building units are set with a view to at least achieving cost-optimal levels, ~~without prejudice to the right of Member States to set minimum requirements which are more energy efficient than cost-optimal energy performance levels.~~ The energy performance shall be calculated in accordance with the methodology referred to in Article 3. Cost-optimal levels shall be calculated in accordance with the comparative methodology framework referred to in Article 5 ~~once the framework is in place.~~

Member States shall take the necessary measures to ensure that minimum energy performance requirements are set for building elements that form part of the building envelope and that have a significant impact on the energy performance of the building envelope when they are replaced or retrofitted, with a view to achieving at least cost-optimal levels.

When setting requirements, Member States may differentiate between new and existing buildings and between different categories of buildings.

These requirements shall take account of general indoor climate conditions, 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.

~~A Member State shall not be required to set minimum energy performance requirements which are not cost effective over the estimated economic lifecycle.~~

~~Member States shall review their minimum energy performance requirements shall be reviewed at regular intervals which shall not be longer than five years and shall, if necessary, shall be updated them in order to reflect technical progress in the building sector, the results of the cost-optimal calculation set out in Article 5, and updated national energy and climate targets and policies.~~

1a. ~~Member States may decide to adapt the requirements referred to in paragraph 1 to buildings officially protected as part of a designated environment or because of their special architectural or historical merit, in so far as compliance with certain minimum energy performance requirements would unacceptably alter their character or appearance.~~

2. Member States may decide not to set or apply the requirements referred to in paragraph 1 to the following categories of buildings:

- ~~(a) buildings officially protected as part of a designated environment or because of their special architectural or historical merit, in so far as compliance with certain~~

~~minimum energy performance requirements would unacceptably alter their character or appearance;~~

- (a) buildings used as places of worship and for religious activities;
- (b) temporary buildings with a time of use of two years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demand and non-residential agricultural buildings which are in use by a sector covered by a national sectoral agreement on energy performance;
- (c) residential buildings which are used or intended to be used for either less than four months of the year or, alternatively, for a limited annual time of use and with an expected energy consumption of less than 25 % of what would be the result of all-year use;
- (d) stand-alone buildings with a total useful floor area of less than 50 m².

Article 5

Calculation of cost-optimal levels of minimum energy performance requirements¹. The Commission shall establish by means of delegated acts in accordance with Articles 23, ~~24 and 25 by 30 June 2011~~ a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements.

The comparative methodology framework shall be established in accordance with Annex III and shall differentiate between new and existing buildings and between different categories of buildings.

2. Member States shall calculate cost-optimal levels of minimum energy performance requirements using the comparative methodology framework established in accordance with paragraph 1 and relevant parameters, such as climatic conditions and the practical accessibility of energy infrastructure and compare the results of this calculation with the minimum energy performance requirements in force.

Member States shall report to the Commission all input data and assumptions used for those calculations and the results of those calculations → ←. Member States shall update and submit those calculation reports to the Commission at regular intervals, which shall not be longer than five years. The first report shall be submitted by 30 June 2011.

3. If the result of the comparison performed in accordance with paragraph 2 shows that the minimum energy performance requirements in force are more than 15% significantly less energy efficient than cost-optimal levels of minimum energy performance requirements, the Member State concerned shall include in the report to the Commission in the report referred to in paragraph 2, accompanied, to the extent that the gap cannot be justified, by a plan outlining appropriate steps to significantly reduce the gap by the next review of the energy performance requirements as referred to in Article 4(1).

4. The Commission shall publish a report on the progress of the Member States in reaching cost-optimal levels of minimum energy performance requirements.

5. The Commission shall revise by 30 June 2026 the comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements in existing buildings undergoing major renovation and for individual building elements.

The comparative methodology framework shall be established in accordance with Annex III and shall differentiate between different categories of buildings.

The first reports following the revised methodology shall be submitted by 30 June 2028.

↓ 2018/844 Art. 1.3

Article 6

New buildings

1. Member States shall ensure that

- (a) as of 1 January 2030, all new buildings are zero-emission buildings in accordance with Annex III; and
- (b) as of 1 January 2027, new buildings occupied or owned by public authorities are zero-emission buildings in accordance with Annex III.

The Commission is empowered to adopt delegated acts in accordance with Article 23 in order to adapt the benchmarks in Annex III to technological progress.

Until the application of the requirements under the first subparagraph, Member States shall ~~take the necessary measures to~~ ensure that all new buildings are at least nearly zero-energy buildings and meet the minimum energy performance requirements laid down in accordance with Article 4.

2. Member States shall ensure that the life-cycle Global Warming Potential (GWP) is calculated and disclosed through the Energy Performance Certificate of the building:

- (a) as of 1 January 2030, for all new buildings;
- (b) as of 1 January 2027, for all new buildings with a useful floor area larger than 2000 square meters.

The GWP is communicated as a numeric indicator for each life cycle stage expressed as kgCO₂e/m² (of useful floor area) averaged for one year of a reference study period of 50 years. The data selection, scenario definition and calculations are carried out in accordance with EN 15978 (BS EN 15978:2011. Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method). The scope of building elements and technical equipment is as defined in the Level(s) common EU framework for indicator 1.2. Where a national calculation tool exists, or is required for making disclosures or for obtaining building permits, the respective tool may be used to provide the required disclosure. Other calculation tools may be used if they fulfil the minimum criteria laid down by the Level(s) common EU framework.

3. Member States shall address, in relation to new buildings, the issues of healthy indoor climate conditions, adaptation to climate change, fire safety and risks related to intense seismic activity.

~~2. Member States shall ensure that, before construction of new buildings starts, the technical, environmental and economic feasibility of high efficiency alternative systems, if available, is taken into account.~~

↓ 2010/31/EU

Article 7

Existing buildings

1. Member States shall 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 4 in so far as this is technically, functionally and economically feasible.

Those requirements shall be applied to the renovated building or building unit as a whole. Additionally or alternatively, requirements may be applied to the renovated building elements.

2. Member States shall in addition take the necessary measures to ensure that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, is retrofitted or replaced, the energy performance of the building element meets minimum energy performance requirements in so far as this is technically, functionally and economically feasible.

3. Member States shall determine these minimum energy performance requirements in accordance with Article 4.

↓ 2018/844 Art. 1.4

4. Member States shall encourage, in relation to buildings undergoing major renovation, high-efficiency alternative systems, in so far as this is technically, functionally and economically feasible, and shall address the issues of healthy indoor climate conditions, adaptation to climate change, fire safety and risks related to intense seismic activity.

Article 7a

Minimum energy performance standards

1. Each Member State shall establish minimum energy performance standards which lead to the renovation of existing buildings.

The national minimum energy performance standards shall be designed with a view to the national targets contained in the Member State's building renovation action plan and to the transformation of the national building stock into zero-emission buildings by 2050.

The standards shall apply at the latest from 2027. By [2035], the entire national building stock shall be covered by minimum energy performance standards.

2. Member States shall ensure that buildings and building units which are sold or rented out to a new tenant, with the exception of building units in multi-apartment buildings,

- (a) achieve at least energy performance class [E], for a transaction taking place after [1 January 2027];
- (b) achieve at least energy performance class [D], for a transaction taking place after [1 January 2030];
- (c) achieve at least energy performance class [C], for a transaction taking place after [1 January 2033].

By derogation from subparagraph 1, a building or building unit that does not comply with the threshold set in subparagraph 1 may be sold under the condition that the buyer brings the building into conformity with the threshold applicable at the moment of sale within [three] years from the date of sale.

3. Member States shall ensure that multi-apartment buildings

- (a) achieve at least energy performance class [E] after [1 January 2030];
- (b) achieve at least energy performance class [D] after [1 January 2035];
- (c) achieve at least energy performance class [C] after [1 January 2040];

4. Member States may decide not to apply the requirements referred to in paragraphs 2 to 3 to the following categories of buildings:

- (a) buildings officially protected as part of a designated environment or because of their special architectural or historical merit, in so far as compliance with certain minimum energy performance requirements would unacceptably alter their character or appearance;
- (b) buildings used as places of worship and for religious activities;
- (c) temporary buildings with a time of use of two years or less, industrial sites, workshops and non-residential agricultural buildings with low energy demand and non-residential agricultural buildings which are in use by a sector covered by a national sectoral agreement on energy performance;
- (d) residential buildings which are used or intended to be used for either less than four months of the year or, alternatively, for a limited annual time of use and with an expected energy consumption of less than 25 % of what would be the result of all-year use;
- (e) stand-alone buildings with a total useful floor area of less than 50 m².

Article 8

Technical building systems, ~~electromobility and smart readiness indicator~~

1. Member States shall, for the purpose of optimising the energy use of technical building systems, set system requirements in respect of the overall energy performance, the proper installation, and the appropriate dimensioning, adjustment and control of the technical building systems which are installed in new or existing buildings. ~~Member States may also apply these system requirements to new buildings.~~ When setting up the requirements, Member States shall account for design conditions and typical or average operating conditions.

Member States shall ensure that the requirements for technical building systems reach at least the latest cost-optimal levels.

Where the setting of system requirements results in specific energy performance requirements for elements that are covered by an energy labelling regulation, Member States shall formulate the technical requirements using direct references to the energy labelling regulation, such as energy efficiency metrics or energy classes. In other cases, Member States shall ensure close alignment to the ecodesign and energy labelling framework, by using available energy efficiency metrics, test points or ratings.

System requirements shall be set for new, replacement and upgrading of technical building systems and shall be applied in so far as they are technically, economically and functionally feasible.

2. Member States shall require new buildings, where technically and economically feasible, to be equipped with self-regulating devices for the separate regulation of the temperature in each room or, where justified, in a designated heated zone of the building unit. In existing buildings, the installation of such self-regulating devices shall be required when heat generators are replaced, where technically and economically feasible.

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

4. Member States shall ensure that, when a technical building system is installed, replaced or upgraded, the overall energy performance of the altered part, and where relevant, of the complete altered system, is assessed. The results shall be documented and passed on to the building owner, so that they remain available and can be used for the verification of compliance with the minimum requirements laid down pursuant to paragraph 1 of this Article and the issue of energy performance certificates.

Article 8a

Infrastructure for sustainable mobility

1. With regard to new non-residential buildings and non-residential buildings undergoing major renovation, with more than ~~ten~~ five parking spaces, Member States shall ensure

- (a) the installation of at least one recharging point ~~within the meaning of Directive 2014/94/EU of the European Parliament and of the Council~~ that is capable of smart charging and, where appropriate based on assessment by the regulatory authority, bidirectional charging, ~~and~~
- (b) ducting infrastructure, namely conduits for electric cables, pre-cabling for ~~at least one in every five~~ every five parking spaces to enable the installation at a later stage of recharging points for electric vehicles, ~~and~~
- (c) at least one bicycle parking space for every car parking space;

where the car park is located inside the building, and, for major renovations, renovation measures include the car park or the electrical infrastructure of the building; or the car park is physically adjacent to the building, and, for major renovations, renovation measures include the car park or the electrical infrastructure of the car park.

Member States shall ensure that the pre-cabling is dimensioned so as to enable the simultaneous use of the expected number of recharging points.

By derogation from point a of the first subparagraph, for new office buildings and office buildings undergoing major renovation, with more than five parking spaces, Member States shall ensure the installation of at least one recharging point that is capable of smart charging and, where appropriate based on assessment by the regulatory authority, bidirectional charging for every two parking spaces.

~~The Commission shall report to the European Parliament and the Council by 1 January 2023 on the potential contribution of a Union building policy to the promotion of electromobility and shall, if appropriate, propose measures in that regard.~~ 3. With regard to all non-residential buildings with more than twenty parking spaces, Member States shall

- (a) lay down requirements for the installation of a minimum number of recharging points that are capable of smart charging and, where appropriate based on assessment by the regulatory authority, bidirectional charging, ~~for all non-residential buildings with more than twenty parking spaces~~, by 1 January 2025;
- (b) ensure the installation of at least one recharging point that are capable of smart charging and, where appropriate based on assessment by the regulatory authority, bidirectional charging, for every ten parking spaces by 1 January 2027; and
- (c) ensure the installation of at least one recharging point that is capable of smart charging and, where appropriate based on assessment by the regulatory authority, bidirectional charging for every five parking spaces by 1 January 2030.

~~4. Member States may decide not to lay down or apply the requirements referred to in paragraphs 2 and 3 to buildings owned and occupied by small and medium sized enterprises as defined in Title I of the Annex to Commission Recommendation 2003/361/EC².~~

5. With regard to new residential buildings and residential buildings undergoing major renovation, with more than ~~ten~~ three parking spaces, Member States shall ensure

- (a) the installation of ~~ducting infrastructure, namely conduits for electric cables, pre-cablings~~ for every parking space to enable the installation, at a later stage, of recharging points for electric vehicles, and
- (b) at least one bicycle parking space for every car parking space,

where the car park is located inside the building, and, for major renovations, renovation measures include the car park or the electric infrastructure of the building; or the car park is physically adjacent to the building, and, for major renovations, renovation measures include the car park or the electrical infrastructure of the car park.

Member States shall ensure that the pre-cablings is dimensioned to enable the simultaneous use of recharging points on all parking spaces.

~~6. Member States may decide not to apply paragraphs 2, 3 and 5 to specific categories of buildings where:~~

- ~~(a) with regard to paragraphs 2 and 5, building permit applications or equivalent applications have been submitted by 10 March 2021;~~
- ~~(b) the ducting infrastructure required would rely on micro-isolated systems or the buildings are situated in the outermost regions within the meaning of Article 349 TFEU, if this would lead to substantial problems for the operation of the local energy system and would endanger the stability of the local grid;~~
- ~~(c) the cost of the recharging and ducting installations exceeds 7% of the total cost of the major renovation of the building;~~
- ~~(d) a public building is already covered by comparable requirements according to the transposition of Directive 2014/94/EU.~~

7. Member States shall provide for measures in order to simplify the deployment of recharging points in new and existing residential and non-residential buildings and ~~address possible~~ remove regulatory barriers, including permitting and approval procedures, ~~without prejudice to the property and tenancy law of the Member States~~. Member States shall remove barriers to the installation of recharging points in residential buildings with parking spaces, such as the need to obtain consent from the landlord or co-owners.

Member States shall ensure the availability of technical assistance for households wishing to install recharging points.

8. Member States shall ~~consider the need for coherent~~ ensure the coherence of policies for buildings, soft and green mobility and urban planning.

~~9. Member States shall ensure that, when a technical building system is installed, replaced or upgraded, the overall energy performance of the altered part, and where relevant, of the complete altered system, is assessed. The results shall be documented and passed on to the building owner, so that they remain available and can be used for the verification of compliance with the minimum requirements laid down pursuant to paragraph 1 of this Article and the issue of energy performance certificates. Without prejudice to Article 12, Member States shall decide whether to require the issuing of a new energy performance certificate.~~

Article 8b

Smart readiness of buildings and energy system integration

1. The Commission shall, by 31 December 2019, adopt a delegated act in accordance with Article 23, supplementing this Directive by establishing 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 and the grid and to improve its energy efficiency and overall performance.

In accordance with Annex Ia, the optional common Union scheme for rating the smart readiness of buildings shall:

- (a) establish the definition of the smart readiness indicator; and
- (b) establish a methodology by which it is to be calculated.

2. In addition, the Commission shall [by 1 January 2026] adopt a delegated act in accordance with Article 23, supplementing this Directive by requiring the application of the common Union scheme for rating the smart readiness of buildings, in accordance with Annex Ia, to non-residential buildings with an effective rated output for heating systems, or systems for combined space heating and ventilation, or air-conditioning systems, or systems for combined air-conditioning and ventilation, of over 290 kW.

3. The Commission shall, by 31 December 2019, and after having consulted the relevant stakeholders, adopt an implementing act detailing the technical modalities for the effective implementation of the scheme referred to in paragraph 10 of this Article, including a timeline for a non-committal test-phase at national level, and clarifying the complementary relation of the scheme to the energy performance certificates referred to in Article 11.

That implementing act shall be adopted in accordance with the examination procedure referred to in Article 26(3).

4. The Commission shall, by 1 January 2026, and after having consulted the relevant stakeholders, adopt an implementing act detailing the technical modalities for the effective implementation of the application of the scheme referred to in paragraph 2 of this Article to non-residential buildings with an effective rated output for heating systems, or systems for combined space heating and ventilation, or air-conditioning systems, or systems for combined air-conditioning and ventilation, of over 290 kW.

That implementing act shall be adopted in accordance with the examination procedure referred to in Article 26(3).

5. Member States shall ensure the energy system integration of buildings [, including through their national building codes].

↓ 2010/31/EU

~~Article 9~~

~~Nearly zero-energy buildings~~

~~1. Member States shall ensure that by 31 December 2020, all new buildings are nearly zero-energy buildings; and~~

~~(b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.~~

~~Member States shall draw up national plans for increasing the number of nearly zero-energy buildings. These national plans may include targets differentiated according to the category of building.~~

~~2. Member States shall furthermore, following the leading example of the public sector, develop policies and take measures such as the setting of targets in order to stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings, and inform the Commission thereof in their national plans referred to in paragraph 1.~~

~~3. The national plans shall include, inter alia, the following elements:~~

~~(a) the Member State's detailed application in practice of the definition of nearly zero-energy buildings, reflecting their national, regional or local conditions, and including a numerical indicator of primary energy use expressed in kWh/m² per year. Primary energy factors used for the determination of the primary energy use may be based on national or regional yearly average values and may take into account relevant European standards;~~

~~(b) intermediate targets for improving the energy performance of new buildings, by 2015, with a view to preparing the implementation of paragraph 1;~~

~~(c) information on the policies and financial or other measures adopted in the context of paragraphs 1 and 2 for the promotion of nearly zero-energy buildings, including details of national requirements and measures concerning the use of energy from renewable sources in new buildings and existing buildings undergoing major renovation in the context of Article 13(4) of Directive 2009/28/EC and Articles 6 and 7 of this Directive.~~

~~4. The Commission shall evaluate the national plans referred to in paragraph 1, notably the adequacy of the measures envisaged by the Member State in relation to the objectives of this Directive. The Commission, taking due account of the principle of subsidiarity, may request further specific information regarding the requirements set out in paragraphs 1, 2 and 3. In that~~

~~case, the Member State concerned shall submit the requested information or propose amendments within nine months following the request from the Commission. Following its evaluation, the Commission may issue a recommendation.~~

↓ ~~1999/2018 Art. 53.3~~

~~5. As part of its State of the Energy Union report referred to in Article 35 of Regulation (EU) 2018/1999, the Commission shall report every four years to the European Parliament and to the Council on the progress of Member States in increasing the number of nearly zero energy buildings. On the basis of this reported information the Commission shall, where necessary, develop an action plan and propose recommendations and measures in accordance with Article 34 of Regulation (EU) 2018/1999 to increase the number of those buildings and encourage best practices as regards the cost effective transformation of existing buildings into nearly zero energy buildings.~~

↓ ~~2010/31/EU~~

~~6. Member States may decide not to apply the requirements set out in points (a) and (b) of paragraph 1 in specific and justifiable cases where the cost benefit analysis over the economic lifecycle of the building in question is negative. Member States shall inform the Commission of the principles of the relevant legislative regimes.~~ Article 10

Financial incentives and market barriers

1. Member States shall provide appropriate financing, support measures and other instruments able to address market barriers and stimulate the necessary investments in energy renovations in line with their national building renovation action plan and with a view to the transformation of their building stock into zero-emission buildings by 2050. ~~In view of the importance of providing appropriate financing and other instruments to catalyse the energy performance of buildings and the transition to nearly zero energy buildings, Member States shall take appropriate steps to consider the most relevant such instruments in the light of national circumstances.~~

2. Member States shall make best cost-effective use of financing available for buildings established at Union level, in particular the Recovery and Resilience Fund, auctioning revenues from emission trading for buildings and road transport under EU Emission Trading System, the Social Climate Fund, cohesion funds and other public funding sources, aiming at mobilising additional private capitals and at stimulating the uptake of dedicated financial products for building renovation.

3. Member States shall promote the roll-out of enabling funding and financial tools, such as energy efficiency loans and mortgages for building renovation, energy performance contracting, fiscal incentives, VAT rates, on-tax schemes, on-bill schemes, guarantee funds, funds targeting deep renovations and funds targeting renovations with significant minimum threshold of targeted energy savings and mortgage portfolio standards.

4. Member States shall adopt measures that ensure that energy efficiency lending products for building renovations are offered widely and in a non-discriminatory manner by financial institutions and are visible and accessible to consumers. Member States shall ensure that banks and other financial institutions and investors receive information on opportunities to participate in the financing of the improvement of energy performance of buildings. Member States shall support the aggregation of a pipeline of sound energy renovation projects in buildings.

5. Member States shall ensure the set-up of technical assistance facilities, including through one-stop-shops, targeting all actors involved in building renovations, including home owners and administrative, financial and economic actors such as suppliers.

6. Member States shall provide measures and financing to promote education and training to ensure that there is a sufficient workforce with the appropriate level of skills corresponding to the needs in the building sector.

↓ 1999/2018 Art. 53.4

↓ 2010/31/EU

7. The Commission shall, where appropriate, assist upon request Member States in setting up national or regional financial support programmes with the aim of increasing the energy performance of ~~efficiency in~~ buildings, especially of existing buildings, by supporting the exchange of best practice between the responsible national or regional authorities or bodies.

~~5. In order to improve financing in support of the implementation of this Directive and taking due account of the principle of subsidiarity, the Commission shall, preferably by 2011, present an analysis on, in particular:~~

~~(a) the effectiveness, the appropriateness of the level, and the actual amount used, of structural funds and framework programmes that were used for increasing energy efficiency in buildings, especially in housing;~~

~~(b) the effectiveness of the use of funds from the EIB and other public finance institutions;~~

~~(c) the coordination of Union and national funding and other forms of support that can act as a leverage for stimulating investments in energy efficiency and the adequacy of such funds for achieving Union objectives.~~

~~On the basis of that analysis, and in accordance with the multiannual financial framework, the Commission may subsequently submit, if it considers this appropriate, proposals with respect to Union instruments to the European Parliament and the Council.~~

↓ 2018/844 Art. 1.6

8. Member States shall link their financial measures for energy performance ~~efficiency~~ improvements in the renovation of buildings to the targeted or achieved energy savings, as determined by one or more of the following criteria:

(a) the energy performance of the equipment or material used for the renovation; in which case, the equipment or material used for the renovation is to be installed by an installer with the relevant level of certification or qualification;

(b) standard values for calculation of energy savings in buildings;

- (c) the improvement achieved due to such renovation by comparing energy performance certificates issued before and after renovation;
- (d) the results of an energy audit;
- (e) the results of another relevant, transparent and proportionate method that shows the improvement in energy performance.

9. Member States shall not provide any financial incentives for the installation of fossil fuel boilers.

10. Member States shall incentivise deep renovation with higher financial, fiscal, administrative and technical support.

Member States shall ensure that staged deep renovation which receives public financial incentives is based on a building renovation passport.

11. Financial incentives shall target as a priority vulnerable customers, people affected by energy poverty and people living in social housing, in line with Article 22 [revised EED].

12. When providing financial incentives to building owners for the renovation of rented buildings, Member States shall ensure that the financial incentives benefit both the building owners and the tenants, for example by providing rent support or by imposing caps on rent increases.

13. Financial incentives shall not be provided for buildings located in areas that are shown to be particularly vulnerable to natural disasters and climate change, such as floodplains or areas that are set to become floodplains, unless it is demonstrated that the targeted buildings will be appropriately protected against the projected hazards.

~~6a. Databases for energy performance certificates shall allow data to be gathered on the measured or calculated energy consumption of the buildings covered, including at least public buildings for which an energy performance certificate, as referred to in Article 13, has been issued in accordance with Article 12.~~

~~6b. At least aggregated anonymised data compliant with Union and national data protection requirements shall be made available on request for statistical and research purposes and to the building owner.~~

↓ 2010/31/EU

~~7. The provisions of this Directive shall not prevent Member States from providing incentives for new buildings, renovations or building elements which go beyond the cost-optimal levels.~~

Article 11

Energy performance certificates

1. Member States shall lay down the necessary measures to establish a system of certification of the energy performance of buildings.

The energy performance certificate shall include the energy performance of a building, expressed by a numeric indicator of primary energy use in kWh/(m².y), and reference values such as minimum energy performance requirements, minimum energy performance standards and zero-emission building requirements, in order to make it possible for owners or tenants of the building or building unit to compare and assess its energy performance;

1a. By December 2025 at the latest, the energy performance certificate shall comply with the template in Annex [X]. It shall specify the energy performance class of the building, on a closed scale using letters from A to G. The letter A shall correspond to zero-emission buildings as defined in Article 2(1a) and the letter G shall correspond to the [15/20]% worst-performing buildings in the national building stock at the time of the introduction of the scale. Member States shall ensure an even distribution of energy performance indicators among the energy performance classes. Member States shall ensure a common visual identity for energy performance certificates on their territory.

1b. Member States shall ensure the quality and reliability of energy performance certificates. They shall ensure that energy performance certificates are issued by independent experts following an on-site visit.

2. The energy performance certificate shall include recommendations for the ~~cost-optimal or~~ cost-effective improvement of the energy performance and reduction of operational greenhouse gases emissions of a building or building unit, unless the building or building unit already complies with the relevant zero-emission building standard ~~there is no reasonable potential for such improvement compared to the energy performance requirements in force.~~

The recommendations included in the energy performance certificate shall cover:

- (a) measures carried out in connection with a major renovation of the building envelope or technical building system(s); and
- (b) measures for individual building elements independent of a major renovation of the building envelope or technical building system(s).

3. The recommendations included in the energy performance certificate shall be technically feasible for the specific building and shall ~~may~~ provide an estimate for the energy savings and the reduction of operational greenhouse gas emissions and the range of payback periods or cost-benefits over its economic lifecycle.

3a. The recommendations shall include an assessment on the feasibility to adapt the system to operate at more efficient temperature settings, such as low temperature emitters for water based heating systems, including the required design thermal power output and temperature/flow requirements.

4. The energy performance certificate shall provide an indication as to where the owner or tenant can receive more detailed information, including as regards the cost-effectiveness of the recommendations made in the energy performance certificate. The evaluation of cost effectiveness shall be based on a set of standard conditions, such as the assessment of energy savings and underlying energy prices and a preliminary cost forecast. In addition, it shall contain information on the steps to be taken to implement the recommendations. Other information on related topics, such as energy audits or incentives of a financial or other nature and financing possibilities, or advice on how to increase the climate resilience of the building, may also be provided to the owner or tenant.

~~5. Subject to national rules, Member States shall encourage public authorities to take into account the leading role which they should play in the field of energy performance of buildings, inter alia, by implementing the recommendations included in the energy performance certificate issued for buildings owned by them within its validity period.~~

6. Certification for building units may be based:

- (a) on a common certification of the whole building; or
- (b) on the assessment of another representative building unit with the same energy-relevant characteristics in the same building.

7. Certification for single-family houses may be based on the assessment of another representative building of similar design and size with a similar actual energy performance quality if such correspondence can be guaranteed by the expert issuing the energy performance certificate.

8. The validity of the energy performance certificate shall not exceed ~~5~~ 10 years.

~~9. The Commission shall, by 2011, in consultation with the relevant sectors, adopt a voluntary common European Union certification scheme for the energy performance of non-residential buildings. That measure shall be adopted in accordance with the advisory procedure referred to in Article 26(2). Member States are encouraged to recognise or use the scheme, or use part thereof by adapting it to national circumstances.~~

9. Member States shall ensure the availability of simplified procedures for updating an energy performance certificate if individual elements are upgraded (i.e. single or standalone measures).

Member States shall ensure the availability of simplified procedures for updating an energy performance certificate when measures identified in a Building Renovation Passport are put in place.

Article 12

Issue of energy performance certificates

1. Member States shall ensure that an energy performance certificate is issued for:

- (a) buildings or building units which are constructed, undergo a major renovation, are sold or rented out to a new tenant or where a rental contract is renewed; and
- (b) buildings where a total useful floor area over 500 m² is owned or occupied by a public authority and frequently visited by the public. On 9 July 2015, this threshold of 500 m² shall be lowered to 250 m².

~~The requirement to issue an energy performance certificate does not apply where a certificate, issued in accordance with either Directive 2002/91/EC or this Directive, for the building or building unit concerned is available and valid.~~

2. Member States shall require that, when buildings or building units are constructed, sold or rented out or where rental contracts are renewed, the energy performance certificate ~~or a~~

~~copy thereof~~ is shown to the prospective ~~new~~ tenant or buyer and handed over to the buyer or ~~new~~ tenant.

3. Where a building is sold or rented out in advance of construction or major renovation, Member States may require the seller to provide an assessment of its future energy performance, as a derogation from paragraphs 1 and 2; in this case, the energy performance certificate shall be issued at the latest once the building has been constructed or renovated and must reflect the as-built state.

4. Member States shall require that buildings or buildings units which ~~— buildings having an energy performance certificate,~~

~~— building units in a building having an energy performance certificate, and~~

~~— building units having an energy performance certificate,~~

are offered for sale or for rent have an energy performance certificate, and that the energy performance indicator and class of the energy performance certificate of the building or the building unit, as applicable, is stated in the advertisements ~~in commercial media~~. Member States shall carry out sample checks or other controls to ensure compliance with these requirements.

5. The provisions of this Article shall be implemented in accordance with applicable national rules on joint ownership or common property.

6. ~~Member States may exclude the categories of buildings referred to in Article 4(2) from the application of paragraphs 1, 2, 4 and 5 of this Article.~~

7. The possible effects of energy performance certificates in terms of legal proceedings, if any, shall be decided in accordance with national rules.

Article 13

Display of energy performance certificates

1. Member States shall take measures to ensure that ~~where a total useful floor area over 500 m²~~ of a building for which an energy performance certificate has been issued in accordance with Article 12(1) is occupied by public authorities and frequently visited by the public, the energy performance certificate is displayed in a prominent place clearly visible to the public.

~~On 9 July 2015, this threshold of 500 m² shall be lowered to 250 m².~~

2. Member States shall require that where a total useful floor area over 500 m² of a building for which an energy performance certificate has been issued in accordance with Article 12(1) is frequently visited by the public, the energy performance certificate is displayed in a prominent place clearly visible to the public.

3. The provisions of this Article do not include an obligation to display the recommendations included in the energy performance certificate.

Article 13a

Databases for energy performance certificates

1. Member States shall set up national databases for energy performance certificates which allow data to be gathered on the energy performance of the buildings covered by certificates and the overall energy performance of the national building stock.

2. The database shall be publicly accessible, in compliance with Union and national data protection rules. Member States shall ensure access to the full energy performance certificate for building owners and tenants. For buildings offered for rent or sale, Member States shall ensure access to the full energy performance certificate for prospective tenants or buyers.

3. Member States shall make publicly available information on the share of buildings in the national building stock covered by energy performance certificates and aggregated or anonymised data on the energy performance of the buildings covered. The public information shall be updated at least twice per year.

4. At least once per year, Member States shall ensure the transfer of the information in the national database to the Building Stock Observatory.

The Commission shall adopt an implementing act with a common template for the transfer of the information to the Building Stock Observatory.

That implementing act shall be adopted in accordance with the examination procedure referred to in Article 26(3).

5. For the purpose of ensuring coherence and consistency of information, Member States shall ensure that all national databases containing information on buildings, such as the national building cadastre, are linked to the national database for energy performance certificates.

↓ 2018/844 Art. 1.7

Article 14

Inspection of heating, ventilation and air-conditioning systems

1. Member States shall lay down the necessary measures to establish regular inspections of ~~the accessible parts of~~ heating, ventilation or air conditioning systems ~~or of systems for combined space heating and ventilation,~~ with an effective rated output of over 70 kW, ~~such as the heat generator, control system and circulation pump(s) used for heating buildings.~~ The effective rating of the system is based on the sum of the rated output of the heating and air-conditioning generators.

2. Member States shall establish separate inspection schemes for the inspections of residential and non-residential systems.

3. Member States may set different inspection frequencies depending on the type and effective rated output of the system whilst taking into account the costs of the inspection of the system and the estimated energy cost savings that may result from the inspection. Systems shall

be inspected at least every 5 years. Systems with generators of an effective rated output of more than 290 kW shall be inspected at least every two years.

4. The inspection shall include the assessment of the heating generator, air-conditioning generator, circulation pumps, fans and control system. Member States may decide to include in the inspection schemes any additional building systems identified under Annex I .

The inspection shall include an assessment of the efficiency and sizing of the ~~heat~~ generator and main components compared with the ~~heating~~ requirements of the building and, where relevant, consider the capabilities of the ~~heating system or of the system for combined space heating and ventilation~~ to optimise its performance under typical or average operating conditions. Where relevant, the inspection shall assess the feasibility of the system to operate under different and more efficient temperature settings, while ensuring the safe operation of the system.

The inspections scheme shall include the assessment of the sizing of the ventilation system compared with the requirements of the building and, where relevant, consider the capabilities of the ventilation system to optimise its performance under typical or average operating conditions.

Where no changes have been made to the ~~heating system or to the system for combined space heating and ventilation~~ or to the ~~heating~~ requirements of the building following an inspection carried out pursuant to this Article, Member States may choose not to require the assessment of the ~~heat generator~~ main component sizing or the assessment of operation under different temperatures to be repeated.

2. Technical building systems that are explicitly covered by an agreed energy performance criterion or a contractual arrangement specifying an agreed level of energy efficiency improvement, such as energy performance contracting, or that are operated by a utility or network operator and therefore subject to performance monitoring measures on the system side, shall be exempt from the requirements laid down in paragraph 1, provided that the overall impact of such an approach is equivalent to that resulting from paragraph 1.

3. As an alternative to paragraph 1 and provided that the overall impact is equivalent to that resulting from paragraph 1, Member States may opt to take measures to ensure the provision of advice to users concerning the replacement of ~~heat~~ generators, other modifications to the ~~heating system or to the system for combined space heating and ventilation~~ and alternative solutions to assess the performance, efficiency and appropriate size of those systems.

Before applying the alternative measures referred to in the first subparagraph of this paragraph, each Member State shall, by means of submitting a report to the Commission, document the equivalence of the impact of those measures to the impact of the measures referred to in paragraph 1.

↓ 1999/2018 Art. 53.5

~~Such a report shall be submitted to the Commission as part of the Member States' integrated national energy and climate plans referred to in Article 3 of Regulation (EU) 2018/1999.~~

4. Member States shall lay down requirements to ensure that, where technically and economically feasible, non-residential buildings with an effective rated output for heating systems or systems for combined space heating and ventilation of over 290 kW are equipped with building automation and control systems by 2025. This threshold shall be lowered to 70 kW by 2030.

The building automation and control systems shall be capable of:

- (a) continuously monitoring, logging, analysing and allowing for adjusting energy use;
- (b) benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or technical building management about opportunities for energy efficiency improvement; and
- (c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.

5. Member States shall ~~may~~ lay down requirements to ensure that from 1 January 2025, new residential buildings and residential buildings undergoing major renovations are equipped with:

- (a) the functionality of continuous electronic monitoring that measures systems' efficiency and informs building owners or managers when it has fallen significantly and when system servicing is necessary; and
- (b) effective control functionalities to ensure optimum generation, distribution, storage and use of energy.

6. Buildings that comply with paragraph 4 or 5 shall be exempt from the requirements laid down in paragraph 1.

7. Member States shall include a summarised analysis of the inspection schemes and their results as an annex to the update of the action plan of the building renovation action plans indicated in Article 2a. Member States that have chosen the alternative measures indicated in paragraph 3, shall include a summarised analysis and the results of the alternative measures.

~~Article 15~~

~~Inspection of air conditioning systems~~

~~1. Member States shall lay down the necessary measures to establish regular inspections of the accessible parts of air conditioning systems or of systems for combined air conditioning and ventilation, with an effective rated output of over 70 kW. The inspection shall include an assessment of the efficiency and sizing of the air conditioning system compared with the~~

~~cooling requirements of the building and, where relevant, consider the capabilities of the air conditioning system or of the system for combined air conditioning and ventilation to optimise its performance under typical or average operating conditions.~~

~~Where no changes have been made to the air conditioning system or to the system for combined air conditioning and ventilation or to the cooling requirements of the building following an inspection carried out pursuant to this paragraph, Member States may choose not to require the assessment of the sizing of the air conditioning system to be repeated.~~

~~Member States that maintain more stringent requirements pursuant to Article 1(3) shall be exempt from the obligation to notify them to the Commission.~~

~~2. Technical building systems that are explicitly covered by an agreed energy performance criterion or a contractual arrangement specifying an agreed level of energy efficiency improvement, such as energy performance contracting, or that are operated by a utility or network operator and therefore subject to performance monitoring measures on the system side, shall be exempt from the requirements laid down in paragraph 1, provided that the overall impact of such an approach is equivalent to that resulting from paragraph 1.~~

~~3. As an alternative to paragraph 1 and provided that the overall impact is equivalent to that resulting from paragraph 1, Member States may opt to take measures to ensure the provision of advice to users concerning the replacement of air conditioning systems or systems for combined air conditioning and ventilation, other modifications to the air conditioning system or system for combined air conditioning and ventilation and alternative solutions to assess the efficiency and appropriate size of those systems.~~

~~Before applying the alternative measures referred to in the first subparagraph of this paragraph, each Member State shall, by means of submitting a report to the Commission, document the equivalence of the impact of those measures to the impact of the measures referred to in paragraph 1.~~

~~↓ 1999/2018 Art. 53.6~~

~~Such a report shall be submitted to the Commission as part of the Member States' integrated national energy and climate plans referred to in Article 3 of Regulation (EU) 2018/1999.~~

~~↓ 2018/844 Art. 1.7~~

~~4. Member States shall lay down requirements to ensure that, where technically and economically feasible, non residential buildings with an effective rated output for systems for air conditioning or systems for combined air conditioning and ventilation of over 290 kW are equipped with building automation and control systems by 2025.~~

~~The building automation and control systems shall be capable of:~~

~~(a) continuously monitoring, logging, analysing and allowing for adjusting energy use;~~

~~(b) benchmarking the building's energy efficiency, detecting losses in efficiency of technical building systems, and informing the person responsible for the facilities or~~

~~technical building management about opportunities for energy efficiency improvement; and~~

~~(c) allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with technical building systems across different types of proprietary technologies, devices and manufacturers.~~

~~5. Member States may lay down requirements to ensure that residential buildings are equipped with:~~

~~(a) the functionality of continuous electronic monitoring that measures systems' efficiency and informs building owners or managers when it has fallen significantly and when system servicing is necessary, and~~

~~(b) effective control functionalities to ensure optimum generation, distribution, storage and use of energy.~~

~~6. Buildings that comply with paragraph 4 or 5 shall be exempt from the requirements laid down in paragraph 1.~~

↓ 2010/31/EU

Article 16

Reports on the inspection of heating, ventilation and air-conditioning systems

1. An inspection report shall be issued after each inspection of a heating, ventilation or air-conditioning system. The inspection report shall contain the result of the inspection performed in accordance with Article 14 ~~or 15~~ and include recommendations for the cost-effective improvement of the energy performance of the inspected system.

The recommendations may be based on a comparison of the energy performance of the system inspected with that of the best available feasible system and a system of similar type for which all relevant components achieve the level of energy performance required by the applicable legislation.

2. The inspection report shall be handed over to the owner or tenant of the building.

3. The inspection report shall be uploaded onto a national database.

Article 17

Independent experts

Member States shall ensure that the energy performance certification of buildings, the establishment of building renovation passports, the smart readiness assessment, ~~and~~ the inspection of heating systems and air-conditioning systems are carried out in an independent manner by qualified and/or accredited experts, whether operating in a self-employed capacity or employed by public bodies or private enterprises.

Experts shall be accredited taking into account their competence.

Member States shall make available to the public information on training and accreditations. Member States shall ensure that either regularly updated lists of qualified and/or accredited experts or regularly updated lists of accredited companies which offer the services of such experts are made available to the public.

Article 18

Independent control system

1. Member States shall ensure that independent control systems for energy performance certificates are established in accordance with Annex II, and that independent control systems for building renovation passports, smart readiness indicators and reports on the inspection of heating and air-conditioning systems are established ~~in accordance with Annex II~~. Member States may establish separate systems for the control of energy performance certificates, building renovation passports, smart readiness indicators and ~~for the control of~~ reports on the inspection of heating and air-conditioning systems.

2. The Member States may delegate the responsibilities for implementing the independent control systems.

Where the Member States decide to do so, they shall ensure that the independent control systems are implemented in compliance with Annex II.

3. Member States shall require the energy performance certificates, the building renovation passports, the smart readiness indicators and the inspection reports referred to in paragraph 1 to be made available to the competent authorities or bodies on request.

↓ 2018/844 Art. 1.8

Article 19

Review

The Commission, assisted by the Committee established by Article 26, shall review this Directive by 1 January 2028 ~~2026~~ at the latest, in the light of the experience gained and progress made during its application, and, if necessary, make proposals.

As part of that review, the Commission shall examine in what manner Member States could apply integrated district or neighbourhood approaches in Union building and energy efficiency policy, while ensuring that each building meets the minimum energy performance requirements, for example by means of overall renovation schemes applying to a number of buildings in a spatial context instead of a single building.

~~The Commission shall, in particular, assess the need for further improvement of energy performance certificates in accordance with Article 11.~~

↓ 2018/844 Art. 1.9

~~Article 19a~~

~~Feasibility study~~

~~The Commission shall, before 2020, conclude a feasibility study, clarifying the possibilities and timeline to introduce the inspection of stand-alone ventilation systems and an optional building renovation passport that is complementary to the energy performance certificates, in order to provide a long-term, step-by-step renovation roadmap for a specific building based on quality criteria, following an energy audit, and outlining relevant measures and renovations that could improve the energy performance.~~

↓ 2010/31/EU

Article 20

Information

1. Member States shall take the necessary measures to inform the owners or tenants of buildings or building units of the different methods and practices that serve to enhance energy performance.

↓ 2018/844 Art. 1.10

2. Member States shall in particular provide information to the owners or tenants of buildings on energy performance certificates, including their purpose and objectives, on cost-effective measures and, where appropriate, financial instruments, to improve the energy performance of the building, and on replacing fossil fuel boilers with more sustainable alternatives. Member States shall provide the information through accessible and transparent advisory tools such as renovation advice and one-stop-shops.

↓ 2010/31/EU

At the request of the Member States, the Commission shall assist Member States in staging information campaigns for the purposes of paragraph 1 and the first subparagraph of this paragraph, which may be dealt with in Union programmes.

3. Member States shall ensure that guidance and training are made available for those responsible for implementing this Directive. Such guidance and training shall address the importance of improving energy performance, and shall enable consideration of the optimal combination of improvements in energy efficiency, use of energy from renewable sources and use of district heating and cooling when planning, designing, building and renovating industrial or residential areas.

4. The Commission is invited to continuously improve its information services, in particular the website that has been set up as a European portal for energy efficiency in buildings directed towards citizens, professionals and authorities, in order to assist Member States in their

information and awareness-raising efforts. Information displayed on this website might include links to relevant European Union and national, regional and local legislation, links to Europa websites that display the National Energy Efficiency Action Plans, links to available financial instruments, as well as best practice examples at national, regional and local level. In the context of the European Regional Development Fund, the Commission shall continue and further intensify its information services with the aim of facilitating the use of available funds by providing assistance and information to interested stakeholders, including national, regional and local authorities, on funding possibilities, taking into account the latest changes in the regulatory framework.

Article 21

Consultation

In order to facilitate the effective implementation of the Directive, Member States shall consult the stakeholders involved, including local and regional authorities, in accordance with the national legislation applicable and as relevant. Such consultation is of particular importance for the application of Articles 9 and 20.

Article 22

Adaptation of Annex I to technical progress

The Commission shall adapt points 3 and 4 of Annex I to technical progress by means of delegated acts in accordance with Articles 23, ~~24 and 25~~.

↓ 2018/844 Art. 1.11

Article 23

Exercise of the delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.
2. The power to adopt delegated acts referred to in Articles 2b, 5, 6, 8b and 22 shall be conferred on the Commission for a period of five years from 9 July 2018. The Commission shall draw up a report in respect of the delegation of power not later than nine months before the end of the five-year period. The delegation of power shall be tacitly extended for periods of an identical duration, unless the European Parliament or the Council opposes such extension not later than three months before the end of each period.
3. The delegation of power referred to in Articles 2b, 5, 6, 8b and 22 may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the *Official Journal of the European Union* or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.

4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 on Better Law-Making.

5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.

6. A delegated act adopted pursuant to 2b, 5, 6, 8b and 22 shall enter into force only if no objection has been expressed either by the European Parliament or the Council within a period of two months of notification of that act to the European Parliament and the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by two months at the initiative of the European Parliament or of the Council.

↓ 2018/844 Art. 1.12

↓ 2018/844 Art. 1.13

Article 26

Committee procedure

1. The Commission shall be assisted by a committee. That committee shall be a committee within the meaning of Regulation (EU) No 182/2011.

2. Where reference is made to this paragraph, Article 4 of Regulation (EU) No 182/2011 shall apply.

3. Where reference is made to this paragraph, Article 5 of Regulation (EU) No 182/2011 shall apply.

↓ 2010/31/EU

Article 27

Penalties

Member States shall lay down the rules on penalties applicable to infringements of the national provisions adopted pursuant to this Directive and shall take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive. Member States shall communicate those provisions to the Commission by 9 January 2013 at the latest and shall notify it without delay of any subsequent amendment affecting them.

Article 28

Transposition

1. Member States shall adopt and publish, ~~by 9 July 2012 at the latest,~~ the laws, regulations and administrative provisions necessary to comply with this Directive ~~Articles 2 to 18, and with Articles 20 and 27~~ by [...] at the latest.. They shall forthwith communicate to the Commission the text of those provisions and a correlation table.

~~They shall apply those provisions as far as Articles 2, 3, 9, 11, 12, 13, 17, 18, 20 and 27 are concerned, from 9 January 2013 at the latest.~~

~~They shall apply those provisions as far as Articles 4, 5, 6, 7, 8, 14, 15 and 16 are concerned, to buildings occupied by the public authorities from 9 January 2013 at the latest and to other buildings from 9 July 2013 at the latest.~~

~~They may defer the application of Article 12(1) and (2) to single building units that are rented out, until 31 December 2015. This shall however not result in fewer certificates being issued than would have been the case under the application of the Directive 2002/91/EC in the Member State concerned.~~

When Member States adopt measures, they shall contain a reference to this Directive or be accompanied by such a reference on the occasion of their official publication. They shall also include a statement that references in existing laws, regulations and administrative provisions to Directive ~~2010/31/EU 2002/91/EC~~ shall be construed as references to this Directive. Member States shall determine how such reference is to be made and how that statement is to be formulated.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 29

Repeal

Directive 2010/31/EU ~~2002/91/EC~~, as amended by [2018 EPBD amendment & Governance Regulation] ~~the Regulation indicated in Annex IV, Part A,~~ is hereby repealed with effect from [...] ~~1 February 2012,~~ without prejudice to the obligations of the Member States relating to the time limit for transposition into national law and application of the Directive set out in Annex IV, Part B.

References to Directive ~~2010/31/EU 2002/91/EC~~ shall be construed as references to this Directive and shall be read in accordance with the correlation table in Annex ~~VI~~.

Article 30

Entry into force

This Directive shall enter into force on the 20th day following its publication in the *Official Journal of the European Union*.

Article 31

Addressees

This Directive is addressed to the Member States.

ANNEX I

COMMON GENERAL FRAMEWORK FOR THE CALCULATION OF ENERGY PERFORMANCE OF BUILDINGS

(referred to in Article 3)

↓ 2018/844 Art. 1.14 and Annex .1(a)

1. The energy performance of a building shall be determined on the basis of calculated ~~or actual~~ energy use and shall reflect typical energy use for space heating, space cooling, domestic hot water, ventilation, built-in lighting and other technical building systems. Member States shall ensure that the typical energy use is representative of actual operating conditions for each relevant typology and reflect the typical user behaviour. Where possible, this shall be based on available national statistics, building codes and metered data.

Member States may use metered energy consumption under typical operating conditions to verify the correctness of the calculated energy use and enable comparison between calculated and actual performance. Member States may use metered energy consumption under typical operating conditions to provide additional information to approximate or benchmark the calculated energy to the actual energy use.

The energy performance of a building shall be expressed by a numeric indicator of primary energy use per unit of reference floor area per year, in kWh/(m².y) for the purpose of both energy performance certification and compliance with minimum energy performance requirements. The methodology applied for the determination of the energy performance of a building shall be transparent and open to innovation.

Member States shall describe their national calculation methodology following Annex A ~~the national annexes~~ of the key European ~~overarching~~ standards on energy performance of buildings, namely EN ISO 52000-1, EN ISO 52003-1, EN ISO 52010-1, EN ISO 52016-1, and EN ISO 52018-1, EN 16798-1 and EN 17423 or superseding documents, ~~developed under mandate M/480 given to the European Committee for Standardisation (CEN)~~. This provision shall not require a legal codification of those standards.

↓ 2018/844 Art. 1.14 and Annex .1(b)

2. The energy needs ~~and energy use~~ for space heating, space cooling, domestic hot water, ventilation, lighting and other technical building systems shall be calculated using hourly or sub-hourly time intervals in order to account for varying conditions that significantly affect the operation and performance of system and the indoor conditions, and to optimise health, indoor air quality and comfort levels defined by Member States at national or regional level.

The calculation of primary energy shall be based on primary energy factors (distinguishing non-renewable, renewable and total) ~~or weighting factors~~ per energy carrier, which must be recognised by the national authorities and may be based on national, regional or local information. Primary energy factors can be set on an annual ~~and possibly also~~ seasonal, monthly, daily or hourly basis ~~annual seasonal or monthly, weighted averages~~ or on more specific information made available for individual district system.

Primary energy factors or weighting factors shall be defined by Member States. The choices made and data sources shall be reported according to EN 17423 or superseding document.

~~In the application of those factors to the calculation of energy performance, Member States shall ensure that the optimal energy performance of the building envelope is pursued.~~

~~In the calculation of the primary energy factors for the purpose of calculating the energy performance of buildings, Member States may take into account renewable energy sources supplied through the energy carrier and renewable energy sources that are generated and used on site, provided that it applies on a non-discriminatory basis. The calculation methodology must account for the possible use of energy from renewable sources for other uses on-site, such as charging points for electric vehicles or appliances. Member States must recognise the benefits of on-site use over exporting to the grid in the calculation of the primary energy factor.~~

↓ 2018/844 Art. 1.14 and Annex .1(c)

2a. For the purpose of expressing the energy performance of a building, Member States may define additional numeric indicators of total, non-renewable and renewable primary energy use, and of greenhouse gas emission produced in $\text{kgCO}_2\text{eq}/(\text{m}^2.\text{y})$.

↓ 2010/31/EU

3. The methodology shall be laid down taking into consideration at least the following aspects:

- (a) the following actual thermal characteristics of the building including its internal partitions:
 - (i) thermal capacity;
 - (ii) insulation;
 - (iii) passive heating;
 - (iv) cooling elements; and
 - (v) thermal bridges;
- (b) heating installation and hot water supply, including their insulation characteristics;
- (c) air-conditioning installations;
- (d) natural and mechanical ventilation which may include air-tightness;
- (e) built-in lighting installation (mainly in the non-residential sector);
- (f) the design, positioning and orientation of the building, including outdoor climate;
- (g) passive solar systems and solar protection;

- (h) indoor climatic conditions, including the designed indoor climate;
 - (i) internal loads.
-

↓ 2018/844 Art. 1.14 and Annex
.1(d)

4. The positive influence of the following aspects shall be taken into account:

↓ 2010/31/EU

- (a) local solar exposure conditions, active solar systems and other heating and electricity systems based on energy from renewable sources;
- (b) electricity produced by cogeneration;
- (c) district or block heating and cooling systems;
- (d) natural lighting.

5. For the purpose of the calculation buildings should be adequately classified into the following categories:

- (a) single-family houses of different types;
- (b) apartment blocks;
- (c) offices;
- (d) educational buildings;
- (e) hospitals;
- (f) hotels and restaurants;
- (g) sports facilities;
- (h) wholesale and retail trade services buildings;
- (i) other types of energy-consuming buildings.

ANNEX II

Template for the national building renovation action plans

(referred to in Article 2a)

The period to be covered is based on the available data

Renovation rate could refer to the average weighted renovation (explanations to be provided)

EPBD Article 2a	Mandatory Indicators	Optional Indicators / comments
(a) Overview of the national building stock	Number of buildings and total floor area (m ²) <ul style="list-style-type: none">— per building type (including public buildings and social housing)— per building age— per building size— per climatic zone— per energy class— NZEB— worst-performing (including a definition)— demolition (number and total floor area)	

<p>Number of EPCs:</p> <ul style="list-style-type: none"> — per building type (including public buildings) — per energy class — per construction period 	
<p>Annual renovation rates: number and total floor area (m²)</p> <ul style="list-style-type: none"> — per building type — to NZEB levels — per renovation depth (weighted average renovation) — major renovations — deep renovations — public buildings 	
<p>Primary and final annual energy consumption (ktoe):</p> <ul style="list-style-type: none"> — per building type — per end use <p>Energy savings (Ktoe)</p> <ul style="list-style-type: none"> — per building type — public buildings <p>Share of RES (MW generated)</p> <ul style="list-style-type: none"> — for different uses — on-site — off-site 	<p>Reduction in energy costs (EUR) per household (average)</p>
<p>Greenhouse gas emissions (kgCO₂eq/(m².y))</p> <ul style="list-style-type: none"> — per building type (including public buildings) <p>CO₂ emissions reduction (kgCO₂eq/(m².y))</p> <ul style="list-style-type: none"> — per building type (including public buildings) 	

<p>Market barriers and failures (description)</p> <ul style="list-style-type: none"> — Split incentives — Capacity of construction and energy sector — Administrative — Financial — Technical — Awareness — Other <p>Number of</p> <ul style="list-style-type: none"> — ESCOs — construction companies — architects and engineers — skilled workers — one-stop-hops — SMES in the construction/renovation sector 	<p>Projections of the construction workforce</p> <ul style="list-style-type: none"> - Architects/engineers/skilled workers retired - Architects/engineers/skilled workers entering the market - Young people in the sector - Women in the sector
<p>Energy poverty (definition)</p> <ul style="list-style-type: none"> — % of people affected by energy poverty — proportion of disposable household income spent on energy — population living in inadequate dwelling conditions (e.g. leaking roof) or with inadequate heating and cooling — % of buildings in lowest energy classes 	

	<p>MEPS in place (description)</p> <ul style="list-style-type: none"> — Number and total floor area of buildings renovated 	
	<p>Primary energy factors</p> <ul style="list-style-type: none"> — Per energy carrier — non-renewable primary energy factor — renewable primary energy factor — total primary energy factor 	
	<p>NZEB definition</p>	
	<p>Cost-optimal minimum requirements for new and existing buildings</p>	
(b) Roadmap for 2030, 2040, 2050	<p>Annual renovation rates: number and total floor area (m²)</p> <ul style="list-style-type: none"> — per building type — worst-performing <p>Expected share (%) of renovated buildings</p> <ul style="list-style-type: none"> — per building type — per renovation depth — major renovations — to NZEB levels 	

<p>Expected primary and final annual energy consumption (ktoe):</p> <ul style="list-style-type: none"> — per building type — per end use <p>Share of RES (MW generated)</p> <ul style="list-style-type: none"> — for different uses <p>Expected energy savings</p> <ul style="list-style-type: none"> — per building type 	
<p>Expected GHG emissions (kgCO₂eq/(m².y))</p> <ul style="list-style-type: none"> — per building type <p>Expected GHG emissions reduction (%)</p> <ul style="list-style-type: none"> — per building type 	
<p>Expected wider benefits for 2030, 2040 and 2050</p> <ul style="list-style-type: none"> — Increase of GDP (share and billion Euros) — Creation of new jobs — % reduction of people affected by energy poverty 	
<p>Contribution to EED target (share and figure in ktoe, primary and final consumption)</p> <ul style="list-style-type: none"> — against the overall EE target 	<p>Contribution to EED target (share and figure in ktoe, primary and final consumption)</p> <ul style="list-style-type: none"> — against Article 8 target
<p>Contribution to RED target (share, MW generated)</p> <ul style="list-style-type: none"> — against overall RES target — against RES target for the building sector 	
<p>Contribution to decarbonisation target (share and figure in (kgCO₂eq/(m².y))</p> <ul style="list-style-type: none"> — against the overall decarbonisation target 	

<p>(c) Overview of implemented and planned policies and measure</p>	<ul style="list-style-type: none"> – Name of policy or measure – Short description (precise scope and modalities of operation) – Main objective – Quantified objective – Type of policy or measure * – Sector(s) affected ** – Planned budget and funding sources – Entities responsible for implementing the policy (including administrative resources and capacities) – Expected impact – Status of implementation – Implementation period 	<p>*Separate options for:</p> <ul style="list-style-type: none"> – Legislative – Economic – Fiscal – Educational, training – Awareness <p>** Separate options for:</p> <ul style="list-style-type: none"> – worst-performing – energy poverty, social housing – public buildings – residential (single-family, multi family) – non-residential – industry – MEPS – RES – phase out fossil fuels in heating and cooling – one-stop-shops – building renovation passports – smart technologies – sustainable mobility in buildings – well-connected buildings, district approaches and communities – skills, training – awareness campaigns and advisory tools
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(c) Overview of planned policies and measure	Same as above	Same as above
(d) Outline of the investment needs, the budgetary sources and the administrative resources	<ul style="list-style-type: none"> – Total investment needs for 2030, 2040, 2050 (million EUR) – Public investments (million EUR) – Private investments (million EUR) – Budgetary resources – Secured budget 	



ANNEX III

Benchmarks for the energy performance of zero emission buildings

(referred to in Article 2(1a))

The primary energy use of a zero emission building shall fulfil the benchmarks indicated in below table for the climatic zones of the European Union.

EU Climatic zone ³	Single-family houses	Multi-family houses	Office buildings	Other non-residential
Mediterranean	[<65 kWh/(m2.y)]	[<65 kWh/(m2.y)]	[<100 kWh/(m2.y)]	[<200 kWh/(m2.y)]
Oceanic	[<60 kWh/(m2.y)]	[<60 kWh/(m2.y)]	[<100 kWh/(m2.y)]	[<100 kWh/(m2.y)]
Continental	[<80 kWh/(m2.y)]	[<80 kWh/(m2.y)]	[<100 kWh/(m2.y)]	[<80 kWh/(m2.y)]
Nordic	[<100 kWh/(m2.y)]	[<100 kWh/(m2.y)]	[<100 kWh/(m2.y)]	[<80 kWh/(m2.y)]

The on-site renewable energy generation of a zero-emission building shall be at least equal to the primary energy use.

³ Mediterranean: CY, HR, IT, EL, MT, ES, PT, Oceanic: BE, DK, IE, DE, FR, LU, NL, Continental: AT, BG, CZ, HU, PL, RO, SL, SK, Nordic: EE, FI, LV, LT, SE.

ANNEX IV

COMMON GENERAL FRAMEWORK FOR RATING THE SMART READINESS OF BUILDINGS

1. The Commission shall establish the definition of the smart readiness indicator and a methodology by which it is to be calculated, in order to assess the capabilities of a building or building unit to adapt its operation to the needs of the occupant and of the grid and to improve its energy efficiency and overall performance.

The smart readiness indicator shall cover features for enhanced energy savings, benchmarking and flexibility, enhanced functionalities and capabilities resulting from more interconnected and intelligent devices.

The methodology shall take into account features such as smart meters, building automation and control systems, self-regulating devices for the regulation of indoor air temperature, built-in home appliances, recharging points for electric vehicles, energy storage and detailed functionalities and the interoperability of those features, as well as benefits for the indoor climate condition, energy efficiency, performance levels and enabled flexibility.

2. The methodology shall rely on three key functionalities relating to the building and its technical building systems:

- (a) the ability to maintain energy performance and operation of the building through the adaptation of energy consumption for example through use of energy from renewable sources;
- (b) the ability to adapt its operation mode in response to the needs of the occupant while paying due attention to the availability of user-friendliness, maintaining healthy indoor climate conditions and the ability to report on energy use; and
- (c) the flexibility of a building's overall electricity demand, including its ability to enable participation in active and passive as well as implicit and explicit demand response, in relation to the grid, for example through flexibility and load shifting capacities.

3. The methodology may further take into account:

- (a) the interoperability between systems (smart meters, building automation and control systems, built-in home appliances, self-regulating devices for the regulation of indoor air temperature within the building and indoor air quality sensors and ventilations); and
- (b) the positive influence of existing communication networks, in particular the existence of high-speed-ready in-building physical infrastructure, such as the voluntary 'broadband ready' label, and the existence of an access point for multi-

dwelling buildings, in accordance with Article 8 of Directive 2014/61/EU of the European Parliament and of the Council⁴.

4. The methodology shall not negatively affect existing national energy performance certification schemes and shall build on related initiatives at national level, while taking into account the principle of occupant ownership, data protection, privacy and security, in compliance with relevant Union data protection and privacy law as well as best available techniques for cyber security.

5. The methodology shall set out the most appropriate format of the smart readiness indicator parameter and shall be simple, transparent, and easily understandable for consumers, owners, investors and demand-response market participants.

⁴ Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks (OJ L 155, 23.5.2014, p. 1).

↓ 2010/31/EU
→₁ 2018/844 Art. 1.14 and Annex
.3(a)

ANNEX V

INDEPENDENT CONTROL SYSTEMS FOR ENERGY PERFORMANCE CERTIFICATES ~~AND INSPECTION~~ REPORTS

1. Definition of quality of energy performance certificate

Member states shall provide a clear definition of what is considered a valid energy performance certificate.

The definition of a valid energy performance certificate shall ensure:

~~1. The competent authorities or bodies to which the competent authorities have delegated the responsibility for implementing the independent control system shall make a random selection of all the energy performance certificates issued annually and subject them to verification. The sample shall be of a sufficient size to ensure statistically significant compliance results.~~

~~The verification shall be based on the options indicated below or on equivalent measures:~~

- (a) validity check of the input data (including on-site checks) of the building used to issue the energy performance certificate and the results stated in the certificate;
- (b) validity of the calculations;
- (c) a maximum deviation for the energy performance of a building, preferably expressed by the numeric indicator of primary energy use (kWh/m² year).
- (d) minimum number of elements differing from default or standard values
- ~~(b) check of the input data and verification of the results of the energy performance certificate, including the recommendations made;~~
- ~~(c) full check of the input data of the building used to issue the energy performance certificate, full verification of the results stated in the certificate, including the recommendations made, and on-site visit of the building, if possible, to check correspondence between specifications given in the energy performance certificate and the building certified.~~

Member States may include additional elements in the definition of a valid energy performance certificate, such as maximum deviation for specific input data values.

2. Quality of EPC control system

3. ~~The competent authorities or bodies to which the competent authorities have delegated the responsibility for implementing the independent control system shall make a random selection of at least a statistically significant percentage of all the inspection reports issued annually and subject those reports to verification.~~ Member States must provide a clear definition of the quality objectives and the level of statistical confidence that the energy performance certificate framework should achieve. At least, the independent control system shall ensure 90% of valid issued energy performance certificates with a statistical confidence of 95% for the evaluated period, which must not exceed one year.

The level of quality and the level of confidence must be measured using random sampling and must account for all elements provided in the definition of a valid energy performance certificate. Member States shall require third-party verification for the evaluation of at least 25% of the random sample when the independent control systems have been delegated to non-governmental bodies.

The validity of the input data must be verified with information provided by the independent expert. Such information may include product certificates, specifications or building plans that include details on the performance of the different elements included in the energy performance certificate.

The validity of the input data must be verified by on-site visits in at least 10% of the energy performance certificates that are part of the random sampling used to assess the overall quality of the scheme.

In addition to the minimum random sampling to determine the overall level of quality, Member States may use different strategies to specifically detect and target poor quality in energy performance certificates with the objective to improve the overall quality of the scheme. Such targeted analysis cannot be used as the basis to measure the overall quality of the scheme.

Member States shall deploy pre-emptive and reactive measures to ensure the quality of the overall energy performance certificate framework. Measures may include: additional training for independent experts, targeted sampling, obligation to re-submit energy performance certificates, proportional fines and temporary or permanent bans for experts.

Where information is added to a database it shall be possible for national authorities to identify the originator of the addition, for monitoring and verification purposes.

4. Availability of energy performance certificates

The independent control system must verify the availability of energy performance certificates to prospective buyers and tenants in order to ensure that it is possible to consider the energy performance of the building in their decision to buy or rent.

The independent control system must verify the visibility of the EPC rating in advertising media.

5. Treatment of building typologies

The independent control system must account for different building typologies, particularly for those building typologies that are most prevalent in the real estate market, such as single residential, multi-residential, offices or retail.

6. Public disclosure

Member States must regularly publish, on the national database on energy performance certificates, at least the following information on the quality system:

- (a) Definition of quality in energy performance certificates
- (b) Quality objectives for the energy performance certificate scheme
- (c) Results of the quality assessment, including number of certificates evaluated and relative size to the total number of issued certificates in the given period (per typology)
- (d) Contingency measures to improve the overall quality of energy performance certificates

↓ 2018/844 Art. 1.14 and Annex .3(b)

~~3. Where information is added to a database it shall be possible for national authorities to identify the originator of the addition, for monitoring and verification purposes.~~

↓ 2010/31/EU

ANNEX IV

COMPARATIVE METHODOLOGY FRAMEWORK TO IDENTIFY COST-OPTIMAL LEVELS OF ENERGY PERFORMANCE REQUIREMENTS FOR BUILDINGS AND BUILDING ELEMENTS

The comparative methodology framework shall enable Member States to determine the energy and emission performance of buildings and building elements and the economic aspects of measures relating to the energy and emission performance, and to link them with a view to identifying the cost-optimal level.

The comparative methodology framework shall be accompanied by guidelines outlining how to apply this framework in the calculation of cost-optimal performance levels.

The comparative methodology framework shall allow for taking into account use patterns, outdoor climate conditions and their future changes according to best available climate science, investment costs, building category, maintenance and operating costs (including energy costs and savings), earnings from energy produced, where applicable, and disposal costs, where applicable. It should be based on relevant European standards relating to this Directive.

The Commission shall also provide:

- guidelines to accompany the comparative methodology framework; these guidelines will serve to enable the Member States to undertake the steps listed below,
- information on estimated long-term energy price developments.

For the application of the comparative methodology framework by Member States, general conditions, expressed by parameters, shall be laid down at Member State level.

The comparative methodology framework shall require Member States to:

- define reference buildings that are characterised by and representative of their functionality and geographic location, including indoor and outdoor climate conditions. The reference buildings shall cover residential and non-residential buildings, both new and existing ones,
- define energy efficiency measures to be assessed for the reference buildings. These may be measures for individual buildings as a whole, for individual building elements, or for a combination of building elements,
- assess the final and primary energy need and resulting emissions of the reference buildings ~~and the reference buildings~~ with the defined energy efficiency measures applied,
- calculate the costs (i.e. the net present value) of the energy efficiency measures (as referred to in the second indent) during the expected economic lifecycle applied to the reference buildings (as referred to in the first indent) by applying the comparative methodology framework principles.

By calculating the costs of the energy efficiency measures during the expected economic lifecycle, the cost-effectiveness of different levels of minimum energy performance requirements is assessed by the Member States. This will allow the determination of cost-optimal levels of energy performance requirements.

ANNEX V

Template for energy performance certificates (referred to in Article 11)

1. On its front page, the EPC must display at least the following elements:

- (a) the energy performance class
- (b) the calculated annual primary energy use in kWh/(m² year)
- (c) the calculated annual energy consumption in kWh or MWh
- (d) renewable energy production in kWh or MWh
- (e) renewable energy in % of energy use
- (f) operational greenhouse gas emissions (kg CO₂/(m² year))
- (g) the greenhouse gases emission class (if applicable)

2. In addition, the energy performance certificate must include at least the following indicators:

- (a) energy use, peak load, size of generator or system, main energy carrier and main type of element for each of the uses: heating, cooling, ventilation and in-built lighting
- (b) renewable energy produced on site, main energy carrier and type of renewable energy source;
- (c) a yes/no indication whether a calculation on whole life carbon emissions has been carried out for the building;
- (d) the value of the whole life carbon emissions (if available);
- (e) a yes/no indication whether a Building Renovation Passport is available for the building;
- (f) the average U-value for the opaque elements of the building envelope;
- (g) the average U-value for the transparent elements of the building envelope;
- (h) type of most common transparent element (e.g. double glazed window);
- (i) results of the analysis on overheating risk (if available);
- (j) the presence of fixed sensors that monitor the levels of Indoor Air Quality;
- (k) the presence of fixed controls that respond to the levels of Indoor Air Quality;

- (l) number and type of charging points for electric vehicles;
- (m) the presence, type and size of energy storage systems;
- (n) feasibility of adapting the heating system to operate at more efficient temperature settings;
- (o) feasibility of adapting the cooling system to operate at more efficient temperature settings.

3. The energy performance may additionally contain the following voluntary indicators:

a) Measured energy consumption

The EPC must include the following links with other initiatives if these apply in the relevant Member State:

- (a) A yes/no indication whether an SRI assessment has been carried out for the building
- (b) The value of the SRI assessment (if available)
- (c) A yes/no indication whether a Digital Building Logbook is available for the building

ANNEX VI

Correlation table

[to be inserted at a later stage]