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COVER NOTE

From:	Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director
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To:	Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union
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Subject:	COMMISSION DELEGATED REGULATION (EU) …/... of 30.6.2025 supplementing Directive (EU) 2024/1275 of the European Parliament and of the Council as regards the establishment of a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements

Delegations will find attached document C(2025) 4133 final.

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Brussels, 30.6.2025
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COMMISSION DELEGATED REGULATION (EU) …/...

of 30.6.2025

supplementing Directive (EU) 2024/1275 of the European Parliament and of the Council as regards the establishment of a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements

(Text with EEA relevance)

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE DELEGATED ACT

Article 6(1) of Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast), also referred to as 'recast EPBD', empowers the Commission to adopt delegated acts in accordance with Article 32 to supplement the Directive concerning the establishment and revision of a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements.

By 30 June 2025, the Commission is tasked with revising the comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements in new buildings and existing buildings undergoing major renovation and for individual building elements. The comparative methodology framework shall be laid down in accordance with Annex VII and shall differentiate between new and existing buildings and between different categories of buildings. The Directive, which constitutes the legal basis of this Commission Delegated Regulation, details the content of the Regulation. More specifically, it introduces new elements and requirements in the 'cost-optimal level' definition in Article 2(32), in Article 6 ('Calculation of cost-optimal levels of minimum energy performance requirements') and in Annex VII ('Comparative methodology framework to identify cost-optimal levels of energy performance requirements for buildings and building elements').

The revision of the Energy Performance of Buildings Directive (EPBD) is part of the 2021 Commission Work Programme 'Fit for 55' package and complements the other components of the package proposed in July 2021 ([1]), setting the vision for achieving a zero-emission building stock by 2050. As already indicated in the climate action plan ([2]), it is a key legislative instrument to deliver on the 2030 and 2050 decarbonisation objectives. The cost-optimal methodology framework is aligned to the Green Deal, for example, by specifying that the costs of greenhouse gas allowances as well as environmental and health externalities of energy use are to be considered when determining the lowest costs.

The cost-optimal methodology framework was first set in 2012, with Delegated Regulation (EU) No 244/2012 (that will be repealed by this new Regulation) enacting Article 5(1) of Directive 2010/31/EU. Since 2013, and every five years thereafter, Member States have been required to calculate the cost-optimal levels of minimum energy performance requirements for buildings and building elements according to the methodology framework set out in the Regulation, to compare them with the minimum energy performance requirements in force, and, in case of significant discrepancies, to adjust the minimum energy performance requirements in force. Member States were also required to report to the Commission all input data and assumptions used for the calculations and the results of those calculations.

As provided for in Annex VII to the recast EPBD, the new framework shall enable the calculation not only of the energy performance, but also the emission performance of buildings and building elements and the economic aspects of measures relating to the energy and emission performance, and shall link them with a view to identifying the cost-optimal level to achieve the 2030 emission reduction and climate neutrality goals, as well as a zero-emission building stock by 2050 at the latest.

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1 Delivering the European Green Deal. - European Commission.

2 Climate Target Plan: Stepping up Europe's 2030 climate ambition Investing in a climate-neutral future for the benefit of our people, COM/2020/562 final.

Pursuant to Article 6(1) subpara. 2, the cost-optimal levels of minimum energy performance requirements for new buildings and existing buildings undergoing major renovation, as well as for individual building elements shall now be in line with the national pathways set out in the national energy and climate plans (NECPs), as submitted to the Commission pursuant to Article 14 of Regulation (EU) 2018/1999.

Article 6(2) subpara. 2 of the recast EPBD also mentions that Member States may take into account the life-cycle Global Warming Potential (GWP) when calculating the cost-optimal levels of minimum energy performance requirements.

In Annex VII (para. 3) to the recast EPBD, new elements that the comparative methodology framework shall take into account are:

– outdoor climate conditions and their future changes according to best available climate projections, including heat and cold waves,

– environmental and health externalities of energy use,

– waste management costs (before 'disposal' costs), where applicable,

– technological developments.

To report to the Commission input data, assumptions, and results of the calculations of cost-optimal levels of minimum energy performance requirements, the template provided in Annex III to the Regulation becomes mandatory pursuant to Article 6(2) subpara. 2 (before, it was voluntary).

When the minimum energy performance requirements in force are less energy-efficient than the calculated cost-optimal levels of minimum energy performance requirements (i.e. by more than 15%), the concerned Member State is now required by Article 6(3) to adjust the minimum energy performance requirements in place within 24 months of the availability of the results of that comparison.

Several other new provisions in the recast EPBD are linked to cost-optimal levels, such as:

– Article 11 on Zero-Emission Buildings (ZEBs), requiring Member States to ensure that the energy demand of a zero-emission building complies with a maximum threshold to be set and later revised with a view to achieving at least the latest cost-optimal levels. The general definition and requirements of ZEBs should also be reflected in the technology packages assessed in the cost-optimal calculations.

– Article 13(1), para. 4, requiring Member States to ensure that the requirements they set for technical building systems reach at least the latest cost-optimal levels.

In parallel, the Guidelines accompanying Commission Delegated Regulation (EU) No 244/2012 of 16 January 2012 (2012/C 115/01) are being revised to reflect the revised cost-optimal methodology framework. The accompanying Guidelines are not legally binding and are intended to facilitate the application of the Regulation and to provide additional information to Member States.

2. CONSULTATIONS PRIOR TO THE ADOPTION OF THE ACT

For the preparation of this Delegated Regulation, the Commission has consulted with Member States' representatives on several occasions.

– Prior to the adoption of Directive (EU) 2024/1275:

  – at the Concerted Action EPBD (CA EPBD) plenary (19-20 April 2023), Session 16 'Adaptation of Cost Optimality in view of EPBD revision'. The CA

EPBD is a joint initiative between the EU Member States and the European Commission. It involves representatives of national ministries or their affiliated institutions who are in charge of preparing the technical, legal and administrative framework for the EPBD in each EU Member State plus Norway. The objective is to enhance the sharing of information and experiences from national adoption and implementation of this important European legislation (https://www.ca-epbd.eu/). The overall objective of the session was (i) to gather feedback on past cost-optimality reporting and (ii) to identify areas for improvement of its implementation as well as adaptation to ZEBs, with a clear focus on the future elements and implementation.

– After the adoption of Directive (EU) 2024/1275:

  – at the online webinar held in the morning of 24 April 2024. Member States were invited through the channel of the EPB Committee and the EPBD CA network was involved to ensure the participation of the relevant representatives of national ministries or their affiliated institutions. The overall objective of the webinar was (i) to present the cost-optimal methodology under the then newly adopted Directive (EU) 2024/1275, including proposals of updates to the global costs calculation, and (ii) to collect feedback on the proposed changes.

  – through the Informal Commission Expert Group 'Energy Performance of Buildings' (E03689):

    – on 17 September 2024, on a 'Working document for the delegated act revising the comparative methodology framework for calculating cost-optimal levels', which was circulated before the meeting. Feedback on the document was collected during the meeting and written comments were collected after the meeting.

    – on 4 December 2024, on a draft of this Regulation and its Annexes, which was circulated before the meeting. Feedback on the document was collected during the meeting and written comments were collected after the meeting.

    – on 7 April 2025, on a draft of the Commission Delegated Regulation and its Annexes. In this occasion, a favourable opinion was adopted by consensus, subject to minor refinements discussed in that meeting.

    – on 22 May 2025, where the refinements introduced in the Commission Delegated Regulation and its Annexes, with the after the discussions in the meeting of 7 April 2025 and the Have your Say feedback period, were presented to Member States.

Professional stakeholders (relevant industry association, non-governmental agencies, academia, and professionals in the building and energy sector, etc.) were consulted, after the adoption of the Directive (EU) 2024/1275, at the online webinar held in the afternoon of 24 April 2024. The overall objective of the webinar was (i) to present the cost-optimal methodology under the then newly adopted Directive (EU) 2024/1275, including proposals for updates to the global costs calculation, and (ii) to collect feedback on the proposed changes.

The draft Commission Delegated Regulation and its Annexes were published for feedback from 9 April to 7 May. During this period, 50 contributions were submitted by a diverse range of respondents, among which business associations were the most numerous, accounting for half of the contributions, followed by non-governmental organisations (10) and

companies/businesses (8). Overall, the respondents expressed their appreciation on being able to comment on the draft delegated act, and they provided constructive feedback for its improvement. Overall, a general support to the file was observed and no major issues were identified. Feedbacks were duly taken into consideration.

Based on the comments received in the Have your Say portal and from Member States, the text has been finalised. Many of the elements that were raised during the Have your Say feedback period are addressed in the revised accompanying Guidelines.

As mentioned, the refinements introduced in the Commission Delegated Regulation and its Annexes, with the after the discussions in the meeting of 7 April 2025 and the Have your Say feedback period, were finally presented to Member States at the Expert Group meeting of 22 May 2025.

Collection and use of expertise

The Joint Research Centre (JRC), which has been supporting the Commission in the technical assessment of the cost-optimal reports received by Member States, provided support on the analysis and assessment of compliance and of national practices as well as of relevant feedback on the text of the Regulation and on the reporting template. The EPBD Concerted Action (EPBD CA) initiative produced analysis of the national experiences concerning the implementation of the EPBD and the reporting of data and results of the cost-optimal calculations every 5 years. In addition, the preparation of the revised Delegated Regulation and Guidelines as well as the collection and analysis of the input from stakeholders were supported by a specific technical support contract ([3]).

3. LEGAL ELEMENTS OF THE DELEGATED ACT

In order to address the new requirements introduced in the recast EPBD, the Delegated Regulation introduces a series of changes compared to the existing one.

Some changes are introduced in the Annex I, detailing the cost-optimal calculation framework, specifically on the Chapter regarding the calculation of the primary energy use and emission performance resulting from the application of measures and packages of measures to the reference buildings.

Total primary energy (kWh/m^{2}y), detailed in both its renewable and non-renewable shares, is the reference metric to be used by Member States for the cost-optimal calculation. In the previous delegated act, this was not specified and non-renewable primary energy was also used for the determination of requirements. Total primary energy as a metric is more suitable for a fully renewable energy system, where different energy performance levels of buildings can be differentiated and the non-renewable part of the energy systems is being gradually phased out. The resulting cost-optimal levels inform Member States and set references and upper boundaries with regards to ZEBs total primary energy use thresholds according to Article 11 of the recast EPBD.

In the cost-optimal framework, the **renewable energy produced and self-consumed on-site** (within building premises), either directly consumed at the time of production or after storage in the building premises, are not to be accounted in the primary energy use. This confirms the

[3] Technical assistance in the review of the cost-optimal calculation methodology for the energy performance of buildings and in the assessment of zero-emission buildings. Request for services No ENER/B3/2022-325 in the context of the Multiple Service Framework Contract N° OP/0021/ENER/C3/2020-724 FWC EE & RES with reopening of competition for qualified legal, technical and economic expertise in the field of Energy Efficiency and Renewable Energy.

approach of the existing Regulation and allows a direct link with the guidance on Annex I of the recast EPBD.

To determine as precisely and as realistically as possible the share of on-site renewable energy production that is used for EPB services or other on-site uses and exported to the energy grid, the Delegated Regulation requires the use of sub-hourly modelling, hourly modelling, or monthly modelling adjusted, e.g. through considering monthly correction factors, for the calculation of on-site renewables.

The methodology framework also requires calculating the **emission performance** (e.g. in terms of greenhouse gas emissions, gCO_2eq/m^2y and of air pollutants emission), which will also be needed for the monetisation of carbon emissions and of the environmental and health externalities of energy use in the macroeconomic calculation. It is specified that, in this context, the emission performance refers to the operational emissions. However, Member States may take into account the life-cycle GWP and, for that purpose, the Delegated Regulation indicates that Member States may use a calculation methodology pursuant to Annex III to Directive (EU) 2024/1275, designed for the calculation of the GWP of new buildings.

To take into account **outdoor climate conditions and their future changes according to best available climate projections**, including heat and cold waves, the Regulation provides in Annex II data projections for heating degree days and cooling degree days prepared by the Commission. Alternatively, Member States may refer to the heating degree days and cooling degree days data, published yearly by Eurostat, to build their national projections, or other relevant sources, appropriately documented.

Environmental and health externalities of energy use mean at least the monetary value of the health and environmental damage caused by the emissions of fine particulate matter ($PM_{2.5}$) and nitrogen oxides (NOx), related to the energy use in buildings. They must be now considered in the global cost calculation at macroeconomic level and the global cost formula has been modified accordingly. Member States may also include in the calculation other air pollutants introduced at Article 1 of Directive (EU) 2016/2284: sulfur dioxide (SO_2), non-methane volatile organic compounds (NMVOC), ammonia (NH_3). However, for the mandatory consideration in the cost-optimal calculations, $PM_{2.5}$ and NOx have been identified. $PM_{2.5}$ is relevant for solid fuel boilers based on bio-energy and fossil fuels (buildings are responsible for about half of primary fine particulate matter emissions in the Union that cause premature death and illness.); NOx for liquid and gaseous fuel burning heating equipment. Energy generation (including district heating) also have an impact in terms of pollutants emissions that need to be taken into consideration. In this calculation, the recommended costs, expressed in terms of EUR per unit of pollutant emission, are made available by the Commission in Annex II and will be updated when new data are available. Specifically, the costs of pollutants emissions are monetised by taking into account impacts from health effects to crop and biodiversity loss as well as material damage.

A link is made in the recast EPBD between the cost-optimal levels and the national pathways set out in the NECPs, with a view to achieve the 2030 emission reduction and climate neutrality goals, as well as a zero-emission building stock by 2050. The new framework allows this through:

– requiring MSs to use **forward-looking primary energy and weighting factors** in the calculation (for example, appropriately averaged over the calculation period). Consistently, forward-looking GHG emission factors are also recommended. This would allow, e.g., the future decarbonisation of the energy system to be considered, when calculating the primary energy and greenhouse gas emission performance of

the measures assessed in the cost-optimal, and support electrification solutions, which will become increasingly decarbonised over time, with the electricity system becoming, in turn, increasingly clean. This is also in line with the provisions in Annex I to the recast EPBD on the 'Common general framework for the calculation of the energy performance of buildings';

– providing updated reference trajectories towards 2050 for carbon and energy prices in line with EU climate neutrality and, specifically, recommending Member States to use the EU ETS carbon prices trajectory provided by the Commission as recommended key parameter for national GHG projections (pursuant to Article 18 of Regulation (EU) 2018/1999).

Annex II provides relevant data for Member States use or consideration for the cost-optimal calculations. Specifically, it provides a table indicating the data which are available for download by Member States at the European Commission website on the dedicated webpage of the EPBD. The available data comprise: estimated long-term energy price developments; estimated long-term carbon price developments; environmental costs for other pollutants; heating degree days (HDD) projections; cooling degree days (CDD) projections; technology cost assumptions. Information will refer to the latest available data and will be updated regularly, e.g. on the occasion of the availability of new relevant information. This will facilitate the work of Member States and make sure that the most recent data are used in their calculation, while addressing the new requirements of the cost-optimal methodology framework detailed in Annex VII to the recast EPBD (para. 3).

Finally, the reporting template in Annex III is now made mandatory: the template largely mirrors the existing one, but it has been updated and modified to reflect the new elements in the calculation. Issues identified in the last cycles of cost-optimal reporting from Member States have been considered in the update of the template. Some simplifications are applied to avoid 'repetitive' reporting. Some elements of flexibility have been introduced to allow Member States to report only relevant information for the calculation or to add parameters that are relevant for the calculation but not mentioned in the template. The template now also reflects the fact that the report now must include a plan to adjust the minimum energy performance requirements in place within 24 months from the reporting of the calculation. The template will also be made available in interoperable editable format at the European Commission website on the dedicated webpage of the Energy Performance of Buildings Directive ([4]).

[4] https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en#energy-performance-of-buildings-standards. The webpage will be updated in due time, when the final version of the template is agreed and this Regulation is ready for adoption.

COMMISSION DELEGATED REGULATION (EU) …/...

of 30.6.2025

supplementing Directive (EU) 2024/1275 of the European Parliament and of the Council as regards the establishment of a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings[1], and in particular Article 6(1) thereof,

Whereas:

(1) Directive (EU) 2024/1275 empowers the Commission to adopt delegated acts to establish a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements, and for the revision of cost-optimal levels.

(2) Directive (EU) 2024/1275 requires Member States to set minimum energy performance requirements for buildings and building elements, with a view to achieving at least cost-optimal levels. Member States are also to ensure that the requirements they set for technical building systems reach at least the latest cost-optimal levels. It is up to Member States to decide whether the national benchmark used as the final outcome of the cost-optimal calculations is calculated from a macro-economic perspective (looking at the costs and benefits of energy efficiency investments for society as a whole) or from a strictly financial viewpoint (looking only at the investment itself). National minimum energy performance requirements are not to be more than 15 % more lenient than the outcome of the cost-optimal results of the calculation taken as the national benchmark. The cost-optimal level is to lie within the range of performance levels where the cost-benefit analysis over the life cycle is positive.

(3) Directive (EU) 2024/1275 promotes the reduction of energy use in the built environment but also emphasises that the building sector is a leading source of greenhouse gas emissions and responsible for about half of primary fine particulate matter ($PM_{2.5}$) emissions in the Union, which cause premature death and illness.

(4) The performance of standalone components falls under the scope of product-specific regulations. Regulation (EU) 2024/1781 of the European Parliament and of the Council[2] establishes minimum energy performance requirements for almost all

[1] OJ L 2024/1275, 8.5.2024, ELI: http://data.europa.eu/eli/dir/2024/1275/oj.

[2] Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products, amending Directive

categories of physical goods, including energy-related products. When setting national requirements for technical building systems, Member States must take into account the implementing measures established under that Regulation and the existing measures adopted pursuant to Directive 2009/125/EC of the European Parliament and of the Council[3]. The performance of construction products to be used for the calculations under this Regulation should be determined in accordance with the provisions of Regulation (EU) 2024/3110 of the European Parliament and of the Council[4], as well as with the existing measures adopted pursuant to Regulation (EU) No 305/2011 of the European Parliament and of the Council[5].

(5) The objective of cost-optimal energy performance levels could, in certain circumstances, justify Member States in setting cost-optimal requirements for building elements that, in practice, raise obstacles for some building design or technical options as well as stimulate the use of energy-related products with better energy performance and, where relevant, emission performance. Pursuant to Article 2, point 32 of Directive (EU) 2024/1275, in order to determine the cost-optimal levels, the environmental and health externalities of energy use are to be taken into account, as well as the cost of greenhouse gas allowances as part of the energy costs.

(6) The steps that comprise the comparative methodology framework are set out in Annex VII to Directive (EU) 2024/1275 and include the establishment of reference buildings, the definition of energy efficiency measures and measures based on renewables to be applied to these reference buildings, the assessment of the total primary energy use and resulting emissions following these measures, and the calculation of the costs, that is to say the net present value, of those measures.

(7) The common framework for the calculation of the energy performance as established in Annex I to Directive (EU) 2024/1275 applies also to all steps of the cost-optimal framework methodology, in particular the calculation of the energy and emission performance of buildings and building elements. On-site energy production using locally available renewable energy sources (e.g. ambient heat, geothermal heat, solar thermal, photovoltaic, etc.) displaces delivered energy from the grid and reduces the impact of the building on the energy grid. To represent these benefits, the impact of self-use of renewable energy produced on site is not to be accounted in total primary energy use. Member States have flexibility regarding how they account renewable energy produced on site that is used for non-EPB uses or exported to the grid in the calculation of a building's primary energy.

(8) For the purpose of this Regulation, the emission performance refers both to the operational emissions produced on-site (direct) and those from off-site generation of energy used by the building (indirect). When calculating the cost-optimal levels of

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(EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC (OJ L 2024/1781, 28.6.2024, ELI: http://data.europa.eu/eli/reg/2024/1781/oj).

3 Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (OJ L 285, 31.10.2009, p. 10, ELI: http://data.europa.eu/eli/dir/2009/125/oj).

4 Regulation (EU) 2024/3110 of the European Parliament and of the Council of 27 November 2024 laying down harmonised rules for the marketing of construction products and repealing Regulation (EU) No 305/2011 (OJ L, 2024/3110, 18.12.2024, ELI: http://data.europa.eu/eli/reg/2024/3110/oj).

5 Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC. (OJ L 88, 4.4.2011, p. 5, ELI: http://data.europa.eu/eli/reg/2011/305/oj).

minimum energy performance requirements, Member States could also take into account the life-cycle global warming potential (GWP).

(9) For the purpose of adapting the comparative methodology framework to national circumstances, Member States should determine the estimated economic life cycle of a building and/or building element; the appropriate cost for energy carriers, products, systems, maintenance, operational and labour costs; the renewable and non-renewable primary energy conversion factors or weighting factors per energy carrier; the greenhouse gas emission conversion factors; the energy price developments to be assumed for fuels used in their national context for energy used in buildings, taking into account the cost of greenhouse gas allowances, where appropriate; and the carbon price developments. As regards energy and carbon price developments, Member States should take into account the information provided by the Commission, as well as the new emission trading system for emissions from fuel combustion in buildings, road transport, and additional sectors[6]. Member States can also include the monetisation of multiple benefits of energy efficiency measures in their cost-optimal calculations, including, for example, for private and public health and the gross domestic product (GDP).

(10) The discount rate reflects to a certain extent not only policy priorities (for macroeconomic calculations), but also different financing environments and mortgage conditions. The choice of a discount rate could have a significant impact on the result of the calculations of the comparative methodology framework and Member States have to determine the most appropriate discount rate for each calculation once the sensitivity assessment is performed. Therefore, Member States should also establish the discount rate to be used in both macroeconomic and financial calculations after having carried out a sensitivity analysis of at least two discount rates for each calculation.

(11) In line with the national emission reduction commitments set for main air pollutants pursuant to Directive (EU) 2016/2284 of the European Parliament and of the Council[7] and with the more stringent air quality standards set by Directive (EU) 2024/2881 of the European Parliament and of the Council[8], air pollutants emissions are introduced in the macroeconomic calculation. The broader perspective provided by the macroeconomic calculation required in this Regulation, including the monetisation of the health and environmental impacts linked to $PM_{2.5}$ and NOx emissions as well as the costs of greenhouse gas (GHG) emissions, provides information that could be useful, also outside of the cost-optimal calculation, for example for establishing additional requirements, including in terms of emission performance, and wider climate, environmental, and public health policy objectives.

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6 Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC (OJ L 275, 25.10.2003, p. 32).

7 Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (OJ L 344, 17.12.2016, p. 1, ELI: http://data.europa.eu/eli/dir/2016/2284/oj).

8 Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (OJ L, 2024/2881, 20.11.2024, ELI: http://data.europa.eu/eli/dir/2024/2881/oj).

(12) To ensure a common approach to the application of the comparative methodology framework by the Member States, the Commission should establish the key framework conditions needed for net present value calculations, such as the starting year for calculations, the cost categories to be considered and the calculation period to be used. This Regulation should replace the existing comparative methodology framework set out in Commission Delegated Regulation (EU) No 244/2012[9].

(13) Establishing a common calculation period does not conflict with the Member States' right to fix the estimated economic life cycle of buildings or building elements, since the latter could be either longer or shorter than the calculation period fixed. The estimated economic life cycle of a building or building element has only limited influence on the calculation period, since the latter is determined instead by the refurbishment cycle of a building, which is the period of time after which a building undergoes a major refurbishment.

(14) Cost calculations and projections with many assumptions and uncertainties, including, for example, energy price developments over time, are generally accompanied by a sensitivity analysis to evaluate the robustness of the key input parameters. For the purpose of the cost-optimal calculations, the sensitivity analysis should address at least the energy price developments and the discount rate.

(15) Forward-looking primary energy factors or weighting factors and greenhouse gas emission factors, appropriately accounted for over the calculation period, allow the progressive decarbonisation of the electricity grid and efficient district heating networks to be taken into consideration in the calculation, in accordance with the 2030 emission reduction and climate neutrality goals set out in the national energy and climate plans submitted to the Commission pursuant to Article 14 of Regulation (EU) 2018/1999 of the European Parliament and of the Council[10]. Such factors should be appropriately specified, for example, by taking into account the situation in the initial year of the calculation and the expected progress throughout the lifetime of the building. Those factors should be reviewed and, where necessary, updated every time a new cost-optimal calculation is performed. They can coincide with the factors set for the calculation of the energy performance of buildings, set in line with Annex I to Directive (EU) 2024/1275. Forward-looking primary energy or weighting factors should be used in the calculation, whereas forward-looking greenhouse gas emissions are recommended.

(16) The comparative methodology framework should enable Member States to compare the results of the cost-optimal calculations with the minimum energy performance requirements in force and to use the result of the comparison to ensure that minimum energy performance requirements are set with a view to achieving at least cost-optimal

[9] Commission Delegated Regulation (EU) No 244/2012 of 16 January 2012 supplementing Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings by establishing a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements (OJ L 81, 21.3.2012, p. 18, ELI: http://data.europa.eu/eli/reg_del/2012/244/oj).

[10] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council (OJ L 328, 21.12.2018, p. 1, ELI: http://data.europa.eu/eli/reg/2018/1999/oj).

levels and, where relevant, more stringent reference values, such as nearly zero-energy building requirements and zero-emission building requirements. Those levels should be aligned to the national pathways set out in the national energy and climate plans (NECP) submitted to the Commission pursuant to Article 14 of Regulation (EU) 2018/1999. It should also be possible for Member States to consider setting minimum energy performance requirements at cost-optimal level for those building categories where no minimum energy performance requirements have existed to date.

(17) The cost-optimal methodology is technologically neutral and does not favour one technological solution over another. It ensures a competition of measures, packages, or variants over the estimated lifetime of a building or building element.

(18) In order to minimise the administrative burden of Member States, it should be possible for Member States to reduce the number of calculations by establishing reference buildings that are representative of more than one building category, without affecting their obligations pursuant to Directive (EU) 2024/1275 to set minimum energy performance requirements for certain building categories.

(19) Cost-optimal levels are also relevant to the new 'zero-emission building' (ZEB) standard, defined in Article 2(2) of Directive (EU) 2024/1275, as the maximum primary energy use thresholds are to be set with a view to achieving at least the cost-optimal levels and are to be reviewed every time that the cost-optimal levels are revised. In line with the ZEB definition, measures producing on site carbon emissions from fossil fuels cannot be considered in the cost-optimal calculations for ZEBs.

(20) Regulation (EU) No 244/2012[11] should therefore be repealed.

(21) The experts designated by each Member State were consulted in accordance with Article 32(4) of Directive (EU) 2024/1275,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

This Regulation establishes the comparative methodology framework to be used by Member States for calculating the cost-optimal levels of minimum energy performance requirements for new and existing buildings and building elements. It also sets out rules for the application of the comparative methodology framework to selected reference buildings.

Article 2

Definitions

In addition to the definitions set out in Article 2 of Directive (EU) 2024/1275, the following definitions shall apply for the purposes of this Regulation:

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[11] Commission Delegated Regulation (EU) No 244/2012 of 16 January 2012 supplementing Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings by establishing a comparative methodology framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements (OJ L 81, 21.3.2012, p. 18, ELI: http://data.europa.eu/eli/reg_del/2012/244/oj).

(1) *'global cost'* means the sum of the present values of the initial investment costs, running costs, replacement costs (referred to the starting year), waste management costs, if applicable and, for the purposes of the calculation at macroeconomic level, it includes costs of greenhouse gas emissions as well as health and environmental externalities of energy use;

(2) *'initial investment cost'* means all costs incurred up to the point when the building or building element is delivered to the customer, ready to use. Those costs include design, purchase of building elements, connection to suppliers, installation and commissioning processes;

(3) *'energy cost'* means the annual energy costs, including energy price, capacity tariffs and grid tariffs, and national taxes, taking into account the cost of greenhouse gas allowances.

(4) *'operational cost'* means all costs linked to the operation of the building, including annual costs for insurance, utility charges and other standing charges and taxes;

(5) *'maintenance cost'* means the annual costs for measures to preserve and restore the desired quality of the building or building element including annual costs for inspection, cleaning, adjustments, repair and consumable items;

(6) *'running cost'* means the annual maintenance, operational and energy costs;

(7) *'waste management cost'* means the cost of a building or building element at the end of its life, including dismantling, removal of building elements that have not yet come to the end of their lifetime, transport, disposal and recycling;

(8) *'replacement cost'* means a substitute investment for a building element, in accordance with the estimated economic life cycle during the calculation period;

(9) *'annual cost'* means the sum of running costs and replacement costs paid per year;

(10) *'cost of greenhouse gas emissions'* means the monetary value of environmental damage caused by CO_2 emissions, related to the energy consumption in buildings;

(11) *'environmental and health externalities of energy use'* means, but is not limited to, the monetary value of the health and environmental damage caused by emissions of $PM_{2.5}$ and NOx, related to the energy consumption in buildings;

(12) *'reference building'* means a hypothetical or real building that represents the typical building geometry and systems, the typical energy performance for both building envelope and systems, the typical functionality and typical cost structure in the Member State, and that is representative of climatic conditions and geographic location;

(13) *'discount rate'* means a specific value to compare the value of money at different times expressed in real terms*;*

(14) *'discount factor'* means a multiplicative number used to convert a cash flow occurring at a given point in time to its equivalent value at the starting point, which is derived from the discount rate;

(15) *'starting year'* means the year from which the calculation period is determined;

(16) *'calculation period'* means the time period considered for the calculation, usually expressed in years;

(17) *'residual value of a building'* means the sum of the residual values of building elements at the end of the calculation period;

(18) *'price development'* means the development over time of prices for energy, products, building systems, services, labour, maintenance and other costs which can be different from the inflation rate;

(19) *'energy efficiency measure'* means a change to a building or building element resulting in a reduction of the building's final energy use;

(20) *'package'* means a set of energy efficiency measures or measures based on renewable energy sources applied to a reference building, or both;

(21) *'variant'* means the global result and description of a full set of measures or packages applied to a building that can be made up of a combination of measures on the building envelope, passive techniques, measures on building systems or measures based on renewable energy sources, or a combination of those measures;

(22) *'subcategories of buildings* means categories of building types that are more disaggregated according to size, age, construction material, use pattern, climatic zone or according to criteria other than those established by point 6 of Annex I to Directive (EU) 2024/1275, for which reference buildings are generally established;

Article 3

Comparative methodology framework

1. When calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements, Member States shall apply the comparative methodology framework laid down in Annex I.

2. Member States shall use the comparative methodology framework to compare the following measures, based on the primary energy and emission performance and the cost attributed to their implementation:

(a) energy efficiency measures;

(b) measures incorporating renewable energy sources;

(c) packages and variants of such measures.

3. For the purpose of the calculation referred to in paragraph 1, Member States

(a) shall establish the year in which the calculation is being performed as the starting year for the calculation;

(b) shall use the calculation period set out in Annex I;

(c) shall use the cost categories set out in Annex I;

(d) are recommended to use the projected carbon price trajectories, set out in Annex II, for carbon costing.

4. For the purposes of the calculation referred to in paragraph 1, Member States shall complement the comparative methodology framework by determining all of the following:

(a) the estimated economic life cycle of buildings and building elements;

(b) the discount rate;

(c) the costs for energy carriers, products and systems, the maintenance costs, the operational costs and the labour costs;

(d) the forward-looking renewable and non-renewable primary energy factors or weighting factors in accordance with Annex I to Directive (EU) 2024/1275 and the greenhouse gas emission factors;

(e) the estimated energy price developments for all energy carriers, taking into account the information set out in Annex II to this Regulation;

(f) the air pollutant emission factors, specifically those for $PM_{2.5}$ and NO_x.

5. Member States shall endeavour to calculate and adopt cost-optimal levels of minimum energy performance requirements in relation to those building categories where there are no set specific minimum energy performance requirements.

6. Member States shall carry out an analysis to determine the sensitivity of the outcome of the calculation to changes in the applied parameters, covering at least the impact of different energy price developments and the discount rates for the macroeconomic and financial perspectives referred to in Article 4(1) and ideally also to changes in other parameters that are expected to have a significant impact on the outcome of the calculations, such as price developments other than for energy.

Article 4

Comparison of the calculated cost-optimal levels with current minimum energy performance requirements

1. Member States shall decide, after calculating the cost-optimal requirement levels from both a macroeconomic and financial perspective, which of the two is to be the national benchmark, and shall report their decision to the Commission as part of their reporting obligations in accordance with Article 6.

2. Member States shall compare the outcome of the calculation chosen in accordance with paragraph 1, with the current energy performance requirements for the relevant building category.

3. Member States shall use the result of the comparison referred to in paragraph 2 of this Article to ensure that minimum energy performance requirements are set with a view to achieving cost-optimal levels, in accordance with Article 5(1) of Directive (EU) 2024/1275.

4. Where a Member State has defined reference buildings in such a way that the result of the cost-optimal calculation is applicable to several building categories, it may use that result to ensure that minimum energy performance requirements are set with a view to achieving cost-optimal levels for all relevant building categories.

Article 5

Review of the cost-optimal calculations

1. Member States shall review their cost-optimal calculations for the purposes of the review of their minimum energy performance requirements pursuant to Article 5(1) of Directive (EU) 2024/1275. The review of the cost-optimal calculations shall in particular include the price developments for the input cost data, and an update of such price developments where appropriate.

2. The results of the cost-optimal calculations review shall be provided to the Commission in the report required by Article 6(2) of Directive (EU) 2024/1275.

Article 6

Reporting

1. The report required by Article 6(2) of Directive (EU) 2024/1275 shall include the primary energy factors or weighting factors applied, the results of the calculations at macroeconomic and financial level, the sensitivity analysis referred to in Article 3(5) of this Regulation and the assumed energy and carbon price developments, as set out in Annex III to this Regulation.

2. Where Member States have to adjust the minimum energy performance requirements pursuant to Article 6(3) of Directive (EU) 2024/1275, the report shall include a plan outlining appropriate steps to make such adjustments. To that effect, the level of the minimum energy performance requirements in force, which is significantly less energy-efficient, shall be calculated as the difference between the average of all the minimum energy performance requirements in force and the average of all cost-optimal levels of the calculation used as the national benchmark for all reference buildings and building types used.

3. Member States shall make use of the reporting template provided in Annex III.

Article 7

Repeal

Delegated Regulation (EU) No 244/2012 is repealed as of 1 January 2026.

Article 8

Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 1 January 2026 for the calculation of the cost-optimal levels of minimum energy performance requirements for buildings and building elements, which are to be reported to the Commission by 30 June 2028.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 30.6.2025

For the Commission
The President
Ursula VON DER LEYEN