## News regarding the amendment of Law no. 372 on the energy performance of buildings

Lucian Gheorghe 1\*

1\* Ovidius University of Constanța (corresponding author, e-mail: gheorghelucian2003@yahoo.com)

*Abstract* – – In July 2024, Law No. 238 was adopted, amending Law No. 372/2005 on the energy performance of buildings. The amendments harmonize definitions with updated national regulations, clarify concepts such as the thermal envelope and nearby renewable sources, and introduce the compliance report for nearly zero-energy buildings (nZEB). They enhance the energy performance certificate by including energy performance class based on primary energy consumption and CO2 emissions, expand building function categories and performance indicators, and specify exemptions from minimum energy performance requirements. Additionally, the amendments update financing options for local authorities and broaden the scope of contraventions, imposing higher fines for non-compliance.

Keywords – building thermal envelope, energy performance, renewable sources, energy performance certificate.

#### **1. INTRODUCTION**

Regulatory act on the Energy Performance of Buildings [1] serves as the national legislative framework transposing the provisions of Directive 2010/31/EU of the European Parliament and of the Council of May 19, 2010, on the energy performance of buildings (recast). Additionally, it incorporates the amendments introduced by Directive 2018/844/EU of the European Parliament and of the Council of May 30, 2018, which updates Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

The Energy Performance of Buildings Directive requires Member States to adopt long-term renovation strategies to modernize their national building stocks, encompassing both public and private buildings. These strategies aim to transition the building stock to a state of high energy efficiency and decarbonization by 2050.

The directive also accelerates the conversion of existing buildings into "nearly zeroenergy buildings" (nZEBs) by 2050. It mandates that all new buildings achieve nearly zero energy consumption starting in 2021 and encourages the integration of smart technologies in the retrofitting of existing buildings. Furthermore, on December 15, 2021, the European Commission proposed a revision of the Energy Performance of Buildings Directive as part of the broader 'Fit for 55' package, aiming to align with the EU's climate goals.

ISSN 2392-6139 / ISSN-L 1584-599

The proposed revision of the Energy Performance of Buildings Directive was adopted in the European Parliament in March this year.

The changes envisaged in the new Directive aim to increase the energy performance of buildings and renovate especially the most inefficient buildings, abandon the use of fossil fuels for heating, widely adopt technological solutions based on renewable energy and adapt buildings to the effects of climate change. The ambition to achieve climate neutrality by 2050 also requires a new vision for the construction sector: the zeroemission building (ZEB), whose very low energy demand, due to its high efficiency, is fully covered by energy from renewable sources, when technically feasible.

All new buildings should be zero-emission from 2028 onwards, with the exception of new buildings occupied, operated or owned by public authorities, for which the deadline would be 2026. The new ZEB standard will replace the current one - nZEB, a building with almost zero energy consumption, which has also become mandatory in Romania since 2021 for any new construction.

### 2. TOWARDS ZERO-EMISSION BUILDINGS: EU STRATEGIES AND STANDARDS FOR ENERGY EFFICIENCY

The European Commission has established a comparative methodological framework to identify the cost-optimal levels of energy performance requirements for buildings. This framework serves as a basis for setting energy efficiency standards that strike a balance between investment costs and long-term operational savings.

Under these regulations, all new buildings must adhere to minimum energy performance standards. Public buildings owned and occupied by public authorities were required to meet the nearly zero-energy standard by December 31, 2018, while this requirement was extended to all other new buildings by December 31, 2020. For existing buildings undergoing major renovations, the energy performance must be upgraded to align with the applicable standards, ensuring their efficiency and sustainability.

To enhance transparency and encourage informed decision-making in the property market, EU Member States are obligated to implement an energy performance certification scheme. These certificates provide essential information to potential buyers or tenants, detailing the building's energy rating. They also include recommendations for cost-effective improvements to boost energy efficiency. Moreover, the certificates must be referenced in all media advertisements for properties being sold or rented, ensuring visibility and accessibility of energy performance information.

In addition to these measures, national authorities in EU Member States are tasked with establishing robust inspection procedures for heating and air conditioning systems. These inspections aim to maintain the efficiency of such systems, contributing to the broader goal of improving energy performance across the building sector.

Directive (EU) 2018/844, as amended, requires Member States to develop comprehensive long-term renovation strategies to support the transformation of residential and non-residential buildings into energy-efficient and decarbonized assets by 2050. These strategies must incorporate a detailed roadmap outlining measurable actions and progress indicators, ensuring alignment with the EU's overarching objective of reducing greenhouse gas emissions by 80-95% by 2050 compared to 1990 levels. The roadmap is also expected to include indicative milestones for 2030, 2040, and 2050, providing a clear trajectory toward these targets. Furthermore, it should specify how

these benchmarks contribute to the EU's broader energy efficiency goals, as established under Directive 2012/27/EU on energy efficiency.

In addition, the revised Directive introduces several key provisions:

- ✓ Expansion of inspection scope: extends the current inspection regime for heating and air conditioning systems to include combined (ventilated) systems, factoring in system performance under typical operating conditions.
- ✓ Promotion of smart technologies: encourages the integration of information and communication technologies, as well as intelligent automation and control systems, within buildings.
- ✓ Support for electric vehicle infrastructure: facilitates the deployment of electric vehicle recharging infrastructure in building car parks by mandating the installation of conduit infrastructure and recharging points.
- ✓ *Introduction of a smart readiness indicator*: establishes a "smart readiness indicator" to evaluate a building's capacity to adapt to occupant needs, optimize operational efficiency, and interact with the energy grid.

Enhancing the energy performance of buildings through the design of low-energy new constructions and the thermal rehabilitation of existing structures, alongside the accurate provision of information to building owners and managers via energy performance certificates, represents a significant and widespread public interest initiative. This aligns with goals of energy conservation, building decarbonization, urban environment improvement, and environmental protection. Within the framework of this new normative act, several key concepts are defined as follows [2]:

- building – "set of spaces with specified functions, delimited by the building elements that make up the building envelope, including the related installations, in which the energy is used to regulate the indoor climate, respectively to ensure indoor comfort for human occupation";

- energy performance of a building – the calculated energy use, based on the methodology for evaluating building energy performance, to meet standard usage needs, primarily including heating, domestic hot water, cooling, ventilation, and lighting;

- building energy performance certificate – a document prepared according to the building energy performance calculation methodology, which specifies a building or unit's energy performance. It includes data on the calculated primary and final energy consumption (including from renewable sources) and CO2 equivalent emissions. The certificate also outlines recommended measures to reduce energy consumption and increase the share of renewable energy in total consumption;

- thermal envelope of a building – ,,the totality of the building elements that delimit the heated/cooled/air-conditioned interior space of a building from the external environment and, if applicable, from the unheated/uncooled/unair-conditioned or less heated/cooled/air-conditioned spaces";

- building element – a component of the building envelope or a technical system/subsystem within the building;

- nearly zero-energy building – a structure with exceptionally high energy performance, where energy consumption is nearly zero or very low and is covered as follows:

a) at least 30% from renewable energy sources, including:

(i) at least 10% from on-site renewable sources.

(ii) at least 20% from renewable energy certified through guarantees of origin, in compliance with applicable legislation.

b) from 2026 onwards, a minimum share of renewable energy sourced on-site or nearby, as specified by Government decision.

- primary energy – energy obtained directly from renewable or non-renewable sources in its natural state, without having undergone any conversion or transformation processes;

- cost-optimal level – the energy performance level that achieves the lowest cost over the building's remaining normative operational period. This cost is determined by considering investment costs for energy performance improvements, maintenance, and operational expenses, as well as the building category. The normative operational period refers to the building's expected lifespan for which energy performance requirements are defined. The cost-optimal level lies within a range where the cost-benefit analysis conducted over the building's operational period yields a positive outcome;

- energy audit of the building – a set of specialized activities aimed at collecting technical data on the energy consumption profile of an existing building or unit. This process involves identifying strategies to enhance energy performance, quantifying the anticipated changes in energy consumption resulting from the proposed measures, assessing their economic efficiency using appropriate indicators, and compiling an audit report in accordance with the methodology for calculating building energy performance.

In summary, the EU's commitment to zero-emission buildings paves the way for energy efficiency and decarbonization, combining sustainability with practical application. These efforts are transforming the building sector while supporting broader climate goals and promoting a healthier, more sustainable future.

### 3. ENERGY PERFORMANCE AND COMPLIANCE STANDARDS FOR NEARLY ZERO-ENERGY BUILDINGS

This normative act also introduced minimum compliance requirements for buildings with nearly zero energy consumption, outlined in the "nZEB compliance report". This report, prepared by a grade I building energy auditor in accordance with the methodology for calculating building energy performance, evaluates whether a building in the design phase fulfills the criteria to be classified as a nearly zero-energy building (nZEB).

The framework for the content of this report is outlined in the methodology for calculating the energy performance of buildings. Additionally, the report includes an assessment of the technical, economic, and environmental feasibility of implementing high-efficiency alternative systems. Another novelty concerns the study on the technical, economic and environmental feasibility of using high-efficiency alternative systems.

This document is prepared by a designer, for new buildings or for buildings that are being renovated, which analyzes the opportunity to use renewable energy sources and establishes the appropriate mix of technologies to reduce the consumption of nonrenewable primary energy and the level of pollution of the building and, in the case of existing buildings, analyzes the opportunity to use renewable energy sources. The framework content of this study is presented in the methodology for calculating the energy performance of buildings. For new buildings, this study can be incorporated into the "nZEB compliance report".

Under the amendments introduced, the energy performance of a building or building unit, calculated in accordance with the methodology for energy performance assessment, is primarily expressed through the following performance indicators: the total specific consumption of primary energy; the energy class; the index, respectively the emission class, CO2 equivalent; total specific energy consumption from renewable sources.

# Sciendo Ovidius University Annals Series: Civil Engineering, Year 26, 2024 152

The energy performance of a building or building unit is determined based on the energy consumption calculated in accordance with the methodology for assessing the energy performance of buildings. It represents the energy usage required for: heating/cooling/air conditioning of the space; domestic hot water; ventilate; interior lighting; other technical systems of the building.

The methodology for calculating the energy performance of buildings is developed in alignment with the European PEC standards from the 52000 series. This methodology establishes the minimum energy performance requirements for buildings or building units, whether new or existing, hereinafter referred to as "requirements". These requirements are applied in a differentiated manner based on the functional typology of the buildings, as follows: residential - collective or individual; offices; education; health; hotels and restaurants; sports; trade; other functions of buildings with human occupation.

The requirements outlined in the methodology for calculating the energy performance of buildings are designed to ensure standardized conditions for a comfortable and healthy indoor climate, including adequate indoor air quality. These requirements aim to mitigate potential adverse effects associated with local climatic conditions, the building's age and location, or inadequate ventilation. However, the minimum performance requirements specified in the Methodology for calculating the energy performance of buildings, indicative Mc 001-2022, are not mandatory for the following categories of buildings: "protected buildings and monuments that are part of legally designated protected built areas or possess special architectural or historical value, where compliance with the requirements would result in unacceptable alterations to their character or external appearance; buildings used for places of worship or other religious activities, which, according to their intended purpose, do not require indoor comfort conditions; temporary buildings planned for use for a duration not exceeding two years; buildings intended for use for less than four months per year, as well as other structures requiring minimal energy consumption or where indoor comfort conditions need to be maintained for less than four months annually; independent buildings, with a usable area of less than 50 m<sup>2</sup>".

The minimum energy performance requirements outlined in the methodology for calculating the energy performance of buildings are not applicable to buildings intended for industrial or agricultural use, outdoor garages, or open spaces with one or more sides exposed, as specified in the original design plans. For new buildings, as well as for existing buildings undergoing major renovations, compliance with the requirements related to the technical systems of buildings, as specified in the applicable technical regulations in force at the time of project development, is mandatory. These requirements pertain to the overall energy performance, proper installation, sizing, regulation, and control of the technical systems and cover at least the following aspects:

- a) space heating systems;
- b) space cooling systems;
- c) domestic hot water preparation systems;

d) ventilation systems;

- e) interior lighting systems;
- f) automation and control systems;
- g) in situ electricity generation systems;

h) any technically and economically feasible combination of these systems.

Self-regulating temperature devices are devices that allow the temperature to be regulated separately in each directly heated/cooled/air-conditioned room of the building or in a heated/cooled/air-conditioned area of the building and/or building unit. They

allow the automatic adjustment of the heating/cooling power according to the interior temperature set by the user. They are not self-regulating temperature devices as defined above:

a) any solution based on manual adjustment of the heating/cooling/air conditioning power, even if the adjustment can be made at the level of the room/area;

b) any solution that allows the automatic regulation of the temperature, but not at the level of the room/area.

In the event that the existing heating/cooling/air conditioning system is replaced by a new heating/cooling/air conditioning system in an existing building or building unit, its owner/manager, as the case may be, is obliged to install self-regulating temperature devices, if this is technically and economically feasible.

When installing, replacing or modernizing an existing technical system or subsystem of a building/group of buildings, the correct functional integration into the system of the modified part and, as the case may be, of the completely modified system will be evaluated by experts certified by the Ministry of Development, Public Works and Administration. The documented results will be sent by them to the owner/manager of the building, in the form of a technical expertise report, in order to remain available and be used for the purpose of verifying compliance with the minimum requirements regarding the technical systems of buildings, established according to the law and for the purpose of issuing energy performance certificates. The expert report on the modified system will also be mentioned in the building's roadmap.

The funding for the development of multiannual local plans aimed at increasing the number of new and existing buildings with nearly zero energy consumption, prepared by local public administration authorities, is provided through the following mechanisms:

a) from its own budgets;

b) from the Structural and Cohesion Funds of the European Union, in accordance with the regulations and procedures for accessing these funds and under the conditions established by the procedural documents specific to the implementation of the operational programmes;

c) from mixed funds, including results from public-private partnerships;

d) from other legally constituted sources.

The preliminary certificates prepared before the acceptance at the completion of the works, as a simulation of the energy performance so as to help the designers and/or builders, are provisional and are not downloaded with a unique number in the database of the Ministry of Development, Public Works and Administration. In order to reduce energy consumption and limit carbon dioxide emissions, periodic inspections shall be carried out, at intervals of 2 years, on accessible parts of space heating systems equipped with boilers and combined space heating and ventilation systems, with a useful rated power of more than 70 kW, such as the heat generator, the control system and circulation pump(s) used to heat buildings and the ducts, dampers or air filters used to treat the air, to ensure the operation of the systems effectively and efficiently in all conditions.

The energy auditors for buildings and the certified technical experts have the obligation to enter the identification data of the documents drawn up, respectively of the energy performance certificates elaborated with the unique registration code issued by the Ministry of Development, Public Works and Administration and of the energy audit reports, as well as the inspection reports of the heating/air conditioning systems and of the combined heating and ventilation/air conditioning and ventilation systems, as the case may be, in its own register of evidence of activity.

#### 4. CONCLUSIONS

By adopting this normative act, the legislative novelties in the field of energy efficiency in buildings that are being prepared at European level have been transposed and strengthen the existing legal framework by harmonizing the provisions regarding the standards and the methodology for calculating the energy performance of buildings. With the entry into force of the methodology, in the middle of this year, a series of novelties have appeared regarding the energy performance of buildings, as well as for the authorization of construction works for new buildings as well as for those that are being renovated.

The main proposed amendments and additions are aimed at harmonizing the definitions with the latest national regulations that have entered into force and clarifying the notions of the building's thermal envelope, respectively renewable sources located nearby, introducing the notion of compliance report for the building whose energy consumption is almost equal to zero (nZEB), filling in the information contained in the energy performance certificate taking into account the establishment of the performance class energy efficiency according to the specific consumption of primary energy and the amount of CO2 equivalent emissions, filling in the types of building functions and performance requirements are not mandatory or applying, filling in the financing possibilities for the preparation of plans by local public administration authorities, expanding the scope of contraventions in the field and increasing fines. The energy efficiency of buildings has an extremely important ecological, economic and social impact. Low energy consumption is essential for economic development, protecting the environment and ensuring an increase in the quality of life.

The level of total primary energy consumption for nearly zero-energy buildings, including energy sourced from renewables, is defined by technical regulations. The use of renewable energy must account for 30% of the total primary energy consumption, as calculated in accordance with the methodology for assessing the energy performance of buildings, irrespective of the building's function or the renewable energy potential of the area in which it is located. As part of the urban planning certificate issued by the competent local public administration authorities for obtaining a building permit, an "nZEB compliance report" will be required. This report must certify that the total primary energy consumption aligns with the levels specified in the methodology for calculating the energy performance of buildings.

At the end of this normative act, it is stipulated that within 180 days from the date of entry into force of the law, the local coordinators shall complete the identification, inventory and estimation of the level of energy performance, according to the calculation methodology in force, of the apartment blocks, as well as of the single-family dwellings owned by individuals who will be subject to the intervention works for thermal rehabilitation. I believe that this 180-day deadline is insufficient for the three major stages, namely the completion of the identification, inventory and estimation of the level of energy performance. Moreover, the law does not specify who has attributions in carrying out these activities and does not specify who will finance their implementation.

Under these circumstances, the regulation of a contravention for non-compliance with the deadline is inappropriate. The amount of the fines proposed for the sanctions provided for in the law are doubled or even tripled, without having a solid justification based on control reports or studies on the impact that the contraventions have on the energy performance equation of buildings and that comply with the applicable fundamental requirements, being much higher than the inflation rate. At the same time, it is necessary that in all texts referring to the Methodology for calculating the energy performance of buildings Mc001 the act by which it was approved is indicated. This provision will give more clarity and at the same time will comply with the legislative technical norms provided by Law no. 24/2000.

#### **5. References**

Law no. 238/2024 of 19 July 2024 amending and supplementing Law no. 372/2005 on the energy performance of buildings, published in the Official Gazette no. 714 of July 22, 2024.
Law no. 372/2005 of 13 December 2005 on the energy performance of buildings. Republished pursuant to art. VII of Law no. 101/2020 for amending and supplementing Law no. 372/2005 on the energy performance of buildings, published in the Official Gazette of Romania, Part I, no. 579 of July 1, 2020, giving the texts a new numbering.