

LEGAL REGULATION OF ENERGY EFFICIENCY OF BUILDINGS WITH A GOAL OF ACHIEVING CLIMATE NEUTRALITY IN THE EU

ПРАВОВЕ РЕГУЛЮВАННЯ ЕНЕРГОЕФЕКТИВНОСТІ БУДІВЕЛЬ З МЕТОЮ ДОСЯГНЕННЯ КЛІМАТИЧНОЇ НЕЙТРАЛЬНОСТІ В ЄС

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Abstract. *The article examines the role of legal regulation of the buildings sector in the implementation of the climate policy of the European Union. It is shown that it is through legal mechanisms that the EU forms a comprehensive approach to reducing energy consumption and emissions in buildings, combining technical standards, financial instruments, strategic planning and behavioral measures. The purpose of the study is to determine the place of the buildings sector in the structure of EU climate law and to analyze how the EU's directives and regulations translate the Union's international obligations into concrete national actions of the Member States. The methodological basis is a systematic, comparative legal and institutional analysis of EU norms and the practice of their implementation. The scientific novelty lies in the comprehensive coverage of buildings as a legal tool of EU's climate policy, combining energy efficiency, decarbonization and behavioral influences.*

Key words: *climate change, Paris Agreement, EU climate law, energy efficiency of buildings, "Fit for 55", climate neutrality.*

Анотація. *У статті досліджено роль правового регулювання будівельного сектору в реалізації кліматичної політики Європейського Союзу. Показано, що саме через правові механізми ЄС формує комплексний підхід до скорочення енергоспоживання та викидів у будівлях, поєднуючи технічні стандарти, фінансові інструменти, стратегічне планування та поведінкові заходи. Метою дослідження є визначення місця будівельного сектору в структурі кліматичного права ЄС та аналіз того, як директиви й регламенти ЄС перетворюють міжнародні зобов'язання Союзу на конкретні національні дії держав-членів. Методологічною основою є системний, порівняльно-правовий і інституційний аналіз норм ЄС та практики їх імплементації. Наукова новизна полягає у комплексному висвітленні будівель як правової категорії кліматичної політики ЄС, що поєднує енергоефективність, декарбонізацію та поведінкові засоби впливу.*

Ключові слова: *боротьба зі зміною клімату, Паризька угода, кліматичне право ЄС, енергоефективність будівель, "Fit for 55", кліматична нейтральність.*

Introduction. The relevance of examining the buildings sector within the climate policy of the European Union stems from the fact that it is through law that the EU shapes systematic mechanisms for influencing energy consumption, emissions, and the broader transformation of its energy model. Buildings constitute a domain in which legal regulation not only establishes technical

performance standards but also directly affects social behaviour, market incentives, and the strategic planning obligations of Member States.

EU law on buildings has acquired particular importance in the context of the European Green Deal and the Union's commitments under the Paris Agreement, as legally binding norms, ranging from energy-performance requirements to long-term renovation strategies, serve as the primary vehicles for achieving measurable emission reductions and enhancing energy security. At the same time, the multi-layered nature of this legal framework, which integrates normative, financial, behavioural, and strategic instruments, makes the buildings sector a central component of both the implementation of the EU's international climate obligations and the internal operationalisation of climate law across the daily practices of Member States.

The purpose of the research is to analyse the legal framework governing the buildings sector within the EU's climate policy and to determine how European law transforms climate commitments into binding national actions.

Recent literature review. The analysis draws on EU's legislative acts governing energy efficiency and building decarbonisation, including Directive 93/76/EEC, Directive 2002/91/EC, Directive 2010/31/EU and its amendment Directive 2018/844/EU, Directive (EU) 2023/1791, Directive (EU) 2023/2413, and Regulation (EU) 2023/956. It also incorporates strategic documents of the European Commission such as COM (2020) 662 ("Renovation Wave") and COM (2021) 550 ("Fit for 55"). Sectoral assessments by the International Energy Agency (IEA, 2023) are used alongside analytical outputs of the European Parliament, the EPRS Briefing (2024) and the study on behavioural approaches to energy efficiency (EP Study 2022). Additional reviewed materials include Finnish national and media reports documenting public energy-saving campaigns (Republic 2022; Xinhua 2022; YLE 2022; Vantaan Energia 2023).

The academic literature reviewed includes studies on the evolution of EU climate policy and its governance instruments (Dupont et al., 2024), analyses of EU climate leadership and implementation dynamics (Oberthür & Dupont, 2021; Gheuens & Oberthür, 2021), and a comprehensive review of life-cycle-based building stock assessment models relevant to EU policymaking (Rödger et al., 2021). Empirical descriptions of behavioural and energy-saving practices in Finland, drawn from media and organisational sources (Republic 2022; Xinhua 2022; YLE 2022; Vantaan Energia 2023), complement the academic publications.

Main research results. According to the International Energy Agency (IEA), buildings account for about 30% of global final energy consumption and account for approximately 26% of energy CO₂ emissions, including both direct emissions from the use of fuels in buildings and indirect emissions from the production of electricity and heat consumed in the sector (IEA, Buildings – Energy System, 2023).

The buildings sector in the European Union has historically been one of the most energy-intensive, accounting for approximately 40% of final energy consumption and 36% of energy CO₂ emissions (European Commission, 2020). This makes the sector a key area of fulfillment of the EU's international obligations under the United Nations Framework Convention on Climate Change (UNFCCC, 1992) and the Paris Agreement (2015), which require parties to keep global temperature rise within 1.5°C and achieve climate neutrality in the second half of the XXI century. The modernization of buildings is critically important on the way to achieving climate neutrality in the EU by 20250, as well as a strategic legal and political tool for fulfilling international obligations in the fight against climate change.

The researchers emphasize that the legal regulation of buildings sector is one of the key tools for decarbonization in the EU, as the transition to nearly zero-energy and zero-emission buildings generates market signals and accelerates the modernization of the building stock (Dupont et al., 2024). According to the researchers such as Johannes Rödger, Alice Passer, Stéphane Lasvaux and Robert Crawford, in the context of climate policy, it is extremely important for the EU buildings sector to assess environmental impact of buildings, taking into account all stages of the life cycle and all relevant categories of impact (Rödger, Passer, Lasvaux, & Crawford, 2021). This approach avoids the transfer of emissions or other forms of environmental burden between materials, technologies or stages of operation, which is critical for the formation of credible climate strategies and effective planning for the decarbonization of the building stock.

The EU's policy in the buildings' sector has been formed in stages. The first measures appeared back in the 1990s within the framework of Directive 93/76/EEC, which provided an initial framework for national energy efficiency programs. In 2002, the first Directive on the Energy Performance of Buildings (EPBD 2002/91/EC) was adopted. It introduced minimum energy efficiency standards, energy certification of buildings and mandatory inspections of heating, ventilation and air conditioning systems. In 2010, the EU updated the rules for buildings: the requirement that all new buildings must consume almost no energy (NZEB) was introduced. Directive 2010/31/EU updated the requirements of EPBD 2002/91/EC and set clear deadlines, when exactly all new private and public buildings should meet this standard (European Parliament & Council, 2010). Subsequently, in 2018, Directive (EU) 2018/844 amended the EPBD and linked building policy to digitalization, smart management systems and long-term national renovation strategies (LTRS), also provided for in Regulation (EU) 2018/1999 on the governance of the Energy Union and Climate Action (European Parliament & Council, 2018).

To ensure coherence in the transition to NZEB and, subsequently, to zero-emission buildings, the EU has established an integrated energy and climate planning system, enshrined in Regulation (EU) 2018/1999, which sets out the obligation of Member States to prepare National Energy and Climate Plans (NECPs) covering the period up to 2030, as well as Long-Term Renovation Strategies (LTRS) aimed at achieving a highly efficient and decarbonised building stock by 2050.

LTRS play the role of a "long trajectory" for the decarbonisation of the construction sector: in them, Member States describe how the existing building stock will be modernised, what financial and regulatory instruments are applied, how energy efficiency standards will increase and when buildings will reach NZEB and zero-emission levels. Thus, LTRS serve as a mechanism for the practical implementation of the objectives set by Directive 2010/31/EU and provide a link between regulatory technical standards and the EU's overall path towards climate neutrality.

Within the framework of the Governance Regulation, NECPs and LTRS together form an integrated reporting and control system, through which the European Commission monitors the implementation of the NDC and the consistency of national actions with the EU climate neutrality strategy. The introduction of NZEB standards, the development of long-term renovation strategies and the implementation of the requirements of Regulation (EU) 2018/1999 form an interconnected legal mechanism within which the EU's international obligations under the NDC are transformed into internal energy and climate planning (NECP and LTRS) and specified through technical standards for energy efficiency and decarbonization of buildings (NZEB/zero-emission buildings).

A new stage has begun with the "Fit for 55" package (European Commission, 2021). The policy of the EU has moved from the NZEB requirement to more radical goals such as zero-emission buildings (ZEB). In 2024, the finally agreed recast EPBD provides: (1) zero emissions for all new buildings from 2030; (2) minimum energy efficiency standards for existing buildings; (3) mandatory national plans for the renovation of the building fund; (4) large-scale deployment of solar technology and heat pumps.

An important element was the reform of the Energy Efficiency Directive (Directive (EU) 2023/1791), which enshrined a mandatory energy saving of 11.7% by 2030 and strengthened the responsibility of member states to reduce consumption in the public sector (European Parliament & Council, 2023).

In parallel, the buildings sector has been included in the new ETS2 emissions trading system (Regulation (EU) 2023/956), which creates economic incentives to move away from fossil heating and accelerate renovation (European Parliament & Council, 2023). In addition, the Renewable Energy Directive RED III (EU 2023/2413) was adopted, which provides for the integration of solar panels into buildings and simplifies the procedures for permits for RES (European Parliament & Council, 2023).

Thus, the energy efficiency of buildings becomes a systemic tool for meeting the EU's international climate commitments, part of the Energy Union and a reference point of a climate-neutral economy by 2050. The scientific papers emphasize that the effectiveness of policies in this sector is determined by the EU's ability to combine technical standards with long-term strategic planning, enshrined in directives and regulations that oblige Member States to renovate and integrate RES (Oberthür & Dupont, 2021). Other scholars point to the need to accelerate the pace of renovation,

as it is buildings that have the greatest potential to rapidly reduce emissions, provided that the right legal and investment environment is created (Gheuens & Oberthür, 2021).

At the same time, information campaigns are increasingly seen in the European Union as an effective tool for changing behavior in the building sector, especially in the context of the energy crisis. According to the International Energy Agency, targeted communication measures can effectively disseminate knowledge about energy conservation and motivate households to take low-cost actions — such as optimally adjusting thermostats or reducing consumption during peak hours (IEA, 2023).

During the 2022 energy crisis due to Russian armed aggression, this approach was widely used in EU member states. One of the most illustrative examples was Finland, where the national campaign “Down a Degree” called on citizens to reduce the temperature in their homes and reconsider their daily energy consumption habits (Republic, 2022). According to surveys, more than 80% of households reported real savings measures, which indicates the high performance of behavioral tools combined with technical requirements for energy efficiency (YLE News, 2022; Finland has also implemented a regular annual Energy Saving Week initiative aimed at raising awareness of the role of household solutions in reducing energy consumption. That is why Finland is among the leaders in the EU in terms of the pace of achieving climate neutrality, having legislated carbon neutrality goals by 2035, which is well ahead of the EU’s 2050 target (European Parliament, 2024). This practice demonstrates that long-term information programs can stabilize useful behavioral patterns and complement structural reforms in the building sector (Vantaan Energia, 2023).

The information campaigns in the EU on energy consumption have gained importance in most EU countries. A study prepared for the European Parliament confirms that Germany, Luxembourg, Belgium, Cyprus and other states have actively used communication and education campaigns as part of national energy efficiency measures, especially in 2022 (European Parliament, 2022). At the same time, such information campaigns in the EU perform a dual function: they support short-term response to crisis situations and at the same time contribute to long-term behavioural change necessary to achieve climate neutrality in the buildings sector.

Conclusions. The analysis of the EU’s legal framework governing the buildings sector demonstrates that a set of interlinked directives and regulations, including the EPBD, the EED, RED III, Regulation (EU) 2018/1999 and the new ETS2 system, establishes a coherent foundation for the decarbonisation of the building stock. These instruments introduce the transition toward nearly zero-energy and zero-emission buildings, set binding renovation and energy-performance requirements, reinforce the integration of renewable energy technologies and define mechanisms for national planning, monitoring and compliance.

Taken together, these legal acts create stable regulatory conditions that encourage long-term investment in building renovation and low-carbon technologies. Behavioural and communication tools, which proved effective during the 2022 energy crisis, complement the normative framework by influencing household energy use and supporting the implementation of legal obligations.

Overall, the combination of regulatory standards, strategic planning instruments, economic incentives and behavioural measures constitutes an integrated governance model that enables the European Union to progressively reduce energy demand, lower emissions and translate its international climate commitments into concrete actions across the buildings sector.

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