E-59
Kongres 2026
Congress 2026

doi: 10.67563/ASESCONF2026016C

Stanko Ćorić[1], Zoran Perović[2]

THE ROLE OF CIVIL ENGINEERS IN BUILDING ENERGY PERFORMANCE CERTIFICATION

Summary: Energy certification of new buildings was introduced in the Republic of Serbia as a mandatory procedure in 2012. In addition to civil engineers, eligibility to take the professional examination and issue Energy Performance Certificates (EPCs) is granted to architects, mechanical engineers, and electrical engineers who have completed at least 300 ECTS credits during their university studies. To date, more than 20,000 Energy Performance Certificates have been issued in the country. This paper analyzes the role and representation of civil engineers in the building energy certification process. Particular attention is given to the current legislative initiative, which is expected to make the certification procedure more complex and increase the scope of work for licensed engineers. Therefore, the paper highlights the importance of preserving the equal role of civil engineers in the energy certification process, particularly in light of the forthcoming legislative amendments.

Keywords: energy certification, energy efficiency, civil engineers

ULOGA GRAĐEVINSKIH INŽENJERA U ENERGETSKOJ SERTIFIKACIJI ZGRADA

Rezime: U Republici Srbiji od 2012. godine je uvedena obavezna energetska sertifikacija za nove zgrade. Pored građevinskih inženjera pravo polaganja stručnog ispita iz ove oblasti imaju i inženjeri arhitekture, mašinstva i elektrotehnike koji su stekli najmanje 300 ESPB tokom studija. Do sada je u Republici Srbiji izdato preko 20000 energetskih pasoša, a u ovom radu se analizira uloga i zastupljenost građevinskih inženjera u ovom postupku. Istovremeno, posebna pažnja je posvećena aktuelnoj inicijativi za izmene zakonske regulative za koju se očekuje da će dodatno usložniti postupak sertifikacije i povećati obim poslova licenciranih inženjera. U tom kontekstu, u radu se ukazuje na značaj očuvanja ravnopravnog učešća svih relevantnih struka u procesu energetske sertifikacije, uz posebno razmatranje uloge građevinskih inženjera u svetlu najavljenih zakonskih izmena.

Ključne reči: energetska sertifikacija, energetska efikasnost, građevinski inženjeri

[1] Faculty of Civil Engineering, University of Belgrade, Serbia, cstanko@grf.bg.ac.rs
[2] Faculty of Civil Engineering, University of Belgrade, Serbia

1. INTRODUCTION

The building sector represents one of the largest energy consumers in the world. According to the European Commission, buildings account for approximately 40% of total energy consumption and are responsible for around 36% of carbon dioxide (CO_2) emissions in the European Union [1]. Considering the significant potential for reducing energy consumption and emissions in this sector, improving the energy performance of buildings represents one of the key goals of European energy and climate policy. In this context, the energy certification of buildings represents an important instrument for assessing the energy characteristics of buildings, determining their energy class, and defining possible measures for improving energy efficiency.

2. LEGISLATIVE FRAMEWORK FOR ENERGY CERTIFICATION OF BUILDINGS IN THE REPUBLIC OF SERBIA

The field of energy efficiency in the building sector in the Republic of Serbia is regulated by a series of laws and secondary legislation that define the energy performance requirements of buildings, the methods for their calculation, and the procedure for issuing Energy Performance Certificates (EPCs). The concept of improving energy efficiency in buildings was introduced into Serbian construction legislation for the first time through the Law on Planning and Construction [2], which entered into force on 11 September 2009. This law represented an important step towards establishing energy performance requirements as an integral part of the building design and construction process. The Rulebook on the Content, Method, and Procedure for the Preparation and Control of Technical Documentation According to the Class and Purpose of Buildings [3] specifies that the energy efficiency elaborate must be submitted together with the project for the building permit, while the Energy Performance Certificate is issued after the completion of construction, prior to obtaining the occupancy permit.

Following these legislative steps, several rulebooks were adopted to further regulate the requirements for the energy performance of buildings and the procedure for issuing Energy Performance Certificates. The first of these is the Regulation on Energy Efficiency of Buildings [4], which defines detailed requirements regarding the energy performance of buildings, methods for calculating the thermal characteristics of buildings, as well as the energy requirements for both new and existing buildings. This was followed by the Rulebook on the Conditions, Content, and Procedure for Issuing Certificates on the Energy Performance of Buildings [5], which defines the content of the Energy Performance Certificate, the certification procedure, and the method for determining the energy class of a building. Both rulebooks have been applied since 30 September 2012, marking the beginning of mandatory building energy certification in Serbia.

An important part of the regulatory framework is also the Rulebook on Taking the Professional Examination in the Field of Spatial and Urban Planning, Preparation of Technical Documentation, Construction and Energy Efficiency, as well as on Licenses for Responsible Persons and the Register of Licensed Engineers, Architects, and Spatial Planners. This regulation specifies that the right to take the professional examination for a responsible engineer for the energy efficiency of buildings is granted to architects, civil engineers, electrical engineers, and mechanical engineers who have completed higher education at a level equivalent to academic or applied studies with at least 300 ECTS credits, who have at least two years of relevant professional experience, and who have completed training in the field of building energy efficiency. The training programme in this field is organized by the Serbian Chamber of Engineers. This license is issued and revoked by the Ministry of Construction, Transport and Infrastructure of the Republic of Serbia

3. CURRENT STATE OF ENERGY CERTIFICATION OF BUILDINGS IN THE REPUBLIC OF SERBIA

Building energy certification in the Republic of Serbia is a procedure for assessing the energy performance of a building based on the calculation of the required amount of energy needed for space heating. The result of this procedure is an Energy Performance Certificate (EPC), also known as an energy passport, which assigns the building to an appropriate energy class according to its calculated energy performance. The energy certification procedure is carried out by authorized organizations that meet the legally prescribed requirements. These organizations are required to employ licensed engineers responsible for building energy efficiency.

All information related to issued Energy Performance Certificates, authorized organizations, and licensed engineers is recorded in the Central Register of Energy Performance Certificates (CREP), which represents a unified database of completed energy certification procedures carried out in the Republic of Serbia [6]. In addition to maintaining records of issued certificates, the register provides insight into the number of licensed engineers and authorized organizations involved in energy certification activities.

According to the Central Register of Energy Performance Certificates (CREP), more than 2,220 licensed engineers authorized to prepare Energy Efficiency Studies and issue Energy Performance Certificates (EPCs) are currently registered in the Republic of Serbia. Based on data available from the ICS (Engineering Chamber of Serbia) database, the share of engineers from different professions in the total number of licensed energy efficiency engineers was determined as of June 2026, and is presented in Figure 1.

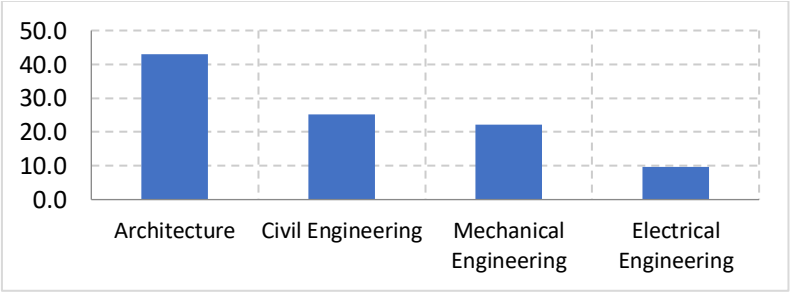

Figure 1: Share of Licensed Energy Efficiency Engineers by Discipline (%)

Civil engineers account for approximately one quarter of all licensed energy efficiency engineers, representing a significant professional group within the register. The overall distribution confirms the multidisciplinary nature of energy efficiency certification, while their considerable share reflects the important contribution of this profession to the assessment of building energy performance

As expected, the level of activity in this field has been increasing over the years. The following Figure present data on the number of issued energy performance certificates for the period since 2016, as the Central Register of Energy Performance Certificates (CREP) was established in that year.

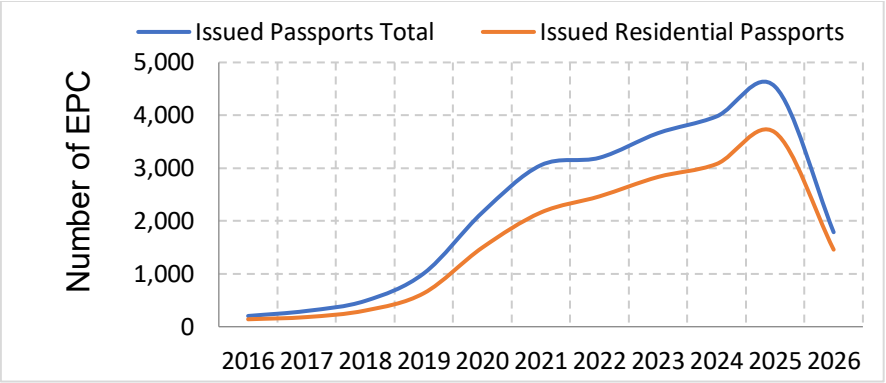

Figure 2: Issued Energy Performance Certificates by Year

It is evident that the number of issued energy performance certificates has been steadily increasing over the years. In 2025, a total of 4,541 certificates were issued, of which 3,675 were for residential buildings. It should be noted that the data presented in the figure refer only to the first five months of 2026.

An analysis of the CREP database further indicates that the majority of Energy Performance Certificates (EPCs) have been issued for residential buildings. The distribution of issued EPCs by building category is presented in Table 1, while the classification of residential buildings according to their energy performance classes is shown in Table 2.

Table 1: The distribution of issued EPCs by building category

Regulation category	Count
Single-family residential buildings	10266
Multi-family residential buildings	8170
Administrative and office buildings	1677
Buildings intended for trade and service activities	1526
Buildings for other purposes that use energy	857
Buildings intended for education and culture	836
Buildings intended for tourism and hospitality	525
Buildings intended for healthcare and social protection	390
Buildings intended for sports and recreation	144

Table 2: Classification of residential buildings according to their energy performance classes

Residential building type	Building status	A+	A	B	C	D	E	F	G
Multi-family residential buildings	New building	3	8	1233	6250	0	0	0	0
Multi-family residential buildings	Existing building	2	2	21	272	105	77	101	96
Single-family residential buildings	New building	1	2	144	8422	0	0	0	0
Single-family residential buildings	Existing building	5	0	21	673	293	165	175	364

Data from the Central Register of Energy Performance Certificates (CREP) provide an overview of the number of certified buildings according to their construction period (Figure 3). It is evident that only a small proportion of buildings constructed before 2012, which are classified by the Rulebook as existing buildings, have undergone energy certification. This

suggests that a substantial share of Serbia's existing building stock remains outside the energy certification process.

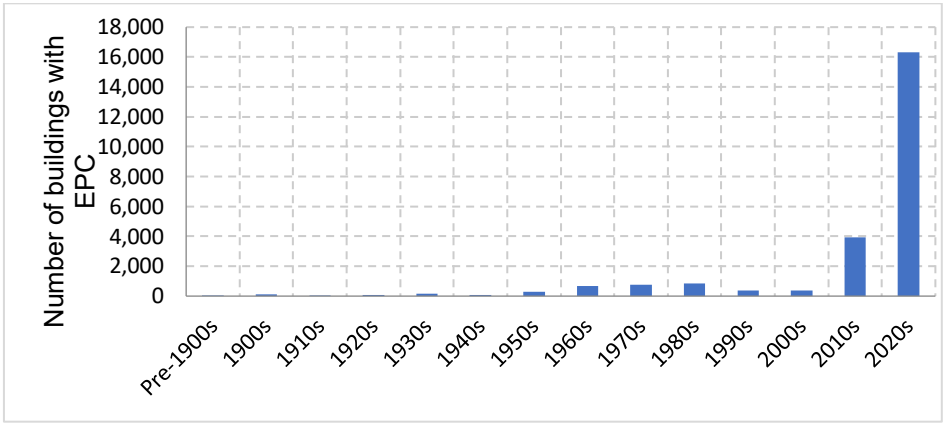

Figure 3: Buildings by Construction Decade

The presented data indicate that the field of building energy performance certification has significant potential for further development in Serbia. The growing number of licensed engineers and issued energy performance certificates, together with the large stock of uncertified existing buildings, points to continued growth in certification activities in the coming years.

4. PROPOSED AMENDMENTS TO EXISTING AND DEVELOPMENT OF NEW REGULATIONS FOR BUILDING ENERGY EFFICIENCY

During the implementation of the current regulations, certain shortcomings have been identified. This paper focuses on one of the key issues related to the issuance of energy performance certificates. At present, the certification process is relatively simplified and, in practice, does not require a comprehensive verification of the actual condition of the completed building.

To address these shortcomings, an initiative has been launched to amend the existing regulatory framework and develop new regulations in the field of building energy efficiency. As part of this initiative, a draft Rulebook on the Procedure for Conducting Energy Audits for the Certification of the Energy Performance of Buildings was prepared with the support of the PLAC III Project under Negotiation Chapter 15 (Energy). The draft Rulebook applies to new buildings, existing buildings undergoing reconstruction, refurbishment, or energy renovation, as well as existing buildings for which energy performance certification is mandatory. In addition, it includes a set of annexes defining all phases of the energy audit process for building energy performance certification. These annexes cover the methodology for conducting energy audits, the preparation of pre-audit questionnaires and questionnaire templates, the identification of energy-saving measures, and the preparation of the final energy audit report. It should be emphasized that the proposed amendments introduce the obligation to obtain Energy Performance Certificates not only for new buildings but also for existing buildings undergoing reconstruction, adaptation, refurbishment, or energy renovation, as well as for existing buildings intended for sale or rental, except for those exempt from mandatory energy certification under this Rulebook.

Within the scope of this paper, only the proposed amendments to the regulatory framework related to energy audits conducted for building energy performance certification will be discussed. Previous experience has shown that the energy certification process has often been

primarily a formal procedure, as a comprehensive energy audit was not considered mandatory. Therefore, the introduction of mandatory energy audits aims to achieve several important objectives. The first objective is to determine the actual energy performance characteristics of a building and assess its compliance with the prescribed requirements. Furthermore, the energy audit should enable the identification of measures for improving energy efficiency in existing buildings, as well as provide recommendations for building operation in relation to meeting the basic requirements for energy management and heat preservation in new buildings. Finally, the energy audit report should be prepared as a basis for issuing the energy performance certificate.

Different procedures are proposed for conducting energy audits of buildings with simple technical systems and buildings with complex technical systems. This classification is based on the gross floor area of the assessed building and the complexity of mechanical systems for heating, cooling, ventilation, and domestic hot water production. In general, the proposal defines buildings with complex technical systems as residential and non-residential buildings with a gross floor area equal to or greater than 600 m². It is proposed that energy audits of buildings with simple technical systems may be carried out by an authorized entrepreneur, company, or other legal entity employing (or engaging) at least two responsible engineers for building energy efficiency from the following professional fields: architecture or civil engineering, and mechanical or electrical engineering. For buildings with complex technical systems, it is proposed that the energy audit should be carried out by three engineers holding License No. 381, representing different professional disciplines.

It is also proposed to introduce an independent verification of energy performance certificates and building energy audit reports.

5. CONCLUSION

Based on the analysis presented in this paper, it is evident that building energy performance certification is a multidisciplinary field involving engineers from several professional disciplines. In the Republic of Serbia, licenses for responsible engineers in building energy efficiency can be obtained by engineers from the fields of civil engineering, architecture, mechanical engineering, and electrical engineering.

Successful implementation of energy certification requires close cooperation between all these disciplines, as each profession contributes specific knowledge and expertise necessary for a comprehensive assessment of building energy performance. At the same time, it is important that all relevant professional fields are adequately represented in regulatory bodies, expert committees, and educational activities related to this field.

The data presented in this paper indicate that civil engineers represent a significant share among licensed energy efficiency engineers. However, their representation in certain professional structures related to energy efficiency certification does not currently fully reflect their share among licensed professionals. Civil engineers are not proportionally represented among lecturers involved in training programs organized by the Serbian Chamber of Engineers. Furthermore, none of the members of the Committee responsible for professional examinations and the issuance of licenses in this field is a civil engineer, while engineers from the other three disciplines (architecture, mechanical engineering, and electrical engineering) are represented on the Committee.

It should also be emphasized that, following the adoption of the new legislative framework, the scope of activities in this field is expected to increase significantly. Therefore, it is essential that all relevant professional disciplines, including civil engineering, remain actively involved in the further development of this process and that their expertise is adequately reflected in future regulatory, educational, and professional activities.

REFERENCES

[1] European Commission. (2020). *In focus: Energy efficiency in buildings*. European Commission. Available at: https://commission.europa.eu/news-and-media/news/focus-energy-efficiency-buildings-2020-02-17_e

[2] Republic of Serbia. (2009). Law on Planning and Construction. Official Gazette of the Republic of Serbia, No. 72/2009, with subsequent amendments.

[3] Ministry of Construction, Transport and Infrastructure of the Republic of Serbia. (2023). Rulebook on the Content, Method and Procedure for Preparation and Control of Technical Documentation According to the Class and Purpose of Buildings. Official Gazette of the Republic of Serbia, No. 96/2023.

[4] Ministry of Construction, Transport and Infrastructure of the Republic of Serbia. (2011). Regulation on Energy Efficiency of Buildings. Official Gazette of the Republic of Serbia, No. 61/2011.

[5] Ministry of Construction, Transport and Infrastructure of the Republic of Serbia. (2012). Rulebook on the Conditions, Content and Procedure for Issuing Certificates on the Energy Performance of Buildings. Official Gazette of the Republic of Serbia, No. 69/2012 (with amendments).

[6] Ministry of Construction, Transport and Infrastructure of the Republic of Serbia. (n.d.). Central Register of Energy Performance Certificates (CREP). Republic of Serbia. Available at: https://www.crep.gov.rs/