

Міністерство освіти Азербайджанської Республіки  
Міністерство освіти і науки України

Азербайджанський архітектурно-будівельний університет  
Національний університет «Полтавська політехніка  
імені Юрія Кондратюка»

# **BUILDING INNOVATIONS – 2020**

Збірник наукових праць  
за матеріалами

III Міжнародної  
азербайджансько-української  
науково-практичної конференції

1 – 2 червня 2020 року

Баку – Полтава 2020

UDK 658.586

**Chichulina K.V.**, PhD, associate professor,  
ORCID: 0000-0001-7448-0180, e-mail: chichulinak@ukr.net  
National University "Yuri Kondratyuk Poltava Polytechnic"

**Manoj Gupta**, PhD, associate professor  
ORCID: 0000-0002-4274-4927, e-mail: manojgupta35@yahoo.co.in  
JECRC University, Jaipur (Rajasthan), India

## ENERGY EFFICIENCY OF BUILDINGS: A COMPARATIVE ANALYSIS OF THE UKRAINIAN AND EUROPEAN REGULATORY FRAMEWORK

**Abstract.** *This paper presents a retrospective analysis of recent years of the regulatory framework in the field of energy efficiency of buildings in Ukraine. The authors conducted a comparison of the existing regulatory documents, both existing and void. General recommendations are given on further steps to implement the norms and standards of Ukraine in the EU regulatory framework and the maximum direction to meet the requirements of Directive 2010/31 / EU.*

**Keywords:** *energy efficiency, legislation, implementation, European and Ukrainian standards (norms), design regulations.*

**Чичуліна К.В.**, к.т.н., доцент,  
ORCID: 0000-0001-7448-0180, e-mail: chichulinak@ukr.net  
Національний університет "Полтавська політехніка імені Юрія Кондратюка"

**Маной Гупта**, к.т.н., доцент,  
ORCID: 0000-0002-4274-4927, e-mail: manojgupta35@yahoo.co.in  
Університет JECRC, Джайпур (Раджастан), Індія

## ЕНЕРГЕТИЧНА ЕФЕКТИВНІСТЬ БУДІВЕЛЬ: ПОРІВНЯЛЬНИЙ АНАЛІЗ НОРМАТИВНОЇ БАЗИ УКРАЇНИ ТА ЄС

**Анотація.** *В роботі представлено ретроспективний аналіз останніх років нормативної бази в сфері енергетичної ефективності будівель в Україні. Авторами проведено порівняння існуючих нормативних документів, як діючих так і тих що втратили чинність. Надано загальні рекомендації щодо подальших кроків імплементації норм і стандартів України до нормативної бази ЄС та максимального направлення на виконання вимог Директиви 2010/31/EU.*

**Ключові слова:** *енергоефективність, законодавство, імплементація, європейські та українські стандарти (норми), нормативні документи проектування.*

Considering DSTU B A. 2. 2-12: 2015 "Energy efficiency of buildings. Method for calculating energy consumption for heating, cooling, ventilation, lighting and hot water", we note that it is Aimed at meeting the requirements of Directive 2010/31/EU energy efficiency of buildings, which provides for the adoption of a national decision on the energy certification procedure. Provides national solutions in accordance with DSTU EN ISO 13790: 2011 and other European Standards (Figure 1).

DSTU-N B A. 2. 2-12: 2015 is aimed at meeting the requirements of Directive 2010/31/EU energy efficiency of buildings, which provides for the adoption of a national energy certification procedure and provides a methodology for calculating energy requirements. Connection of the DSTU B standard A. 2. 2-12: 2015 Energy efficiency of

buildings. The method for calculating energy consumption for heating, cooling, ventilation and DHW with other European standards is shown in Figure 2.

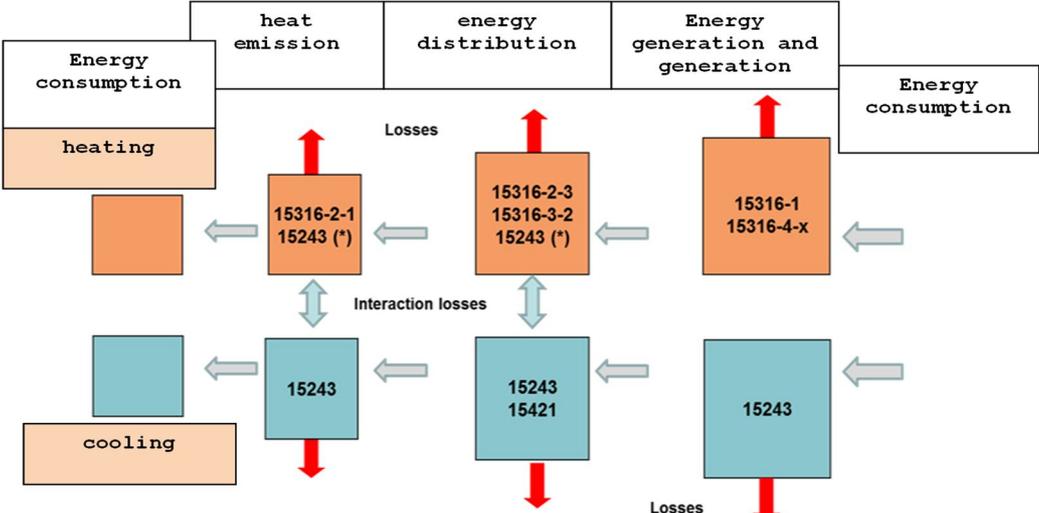


Figure 1 – The main directions of the method for calculating energy consumption for heating, cooling, ventilation, lighting and hot water supply

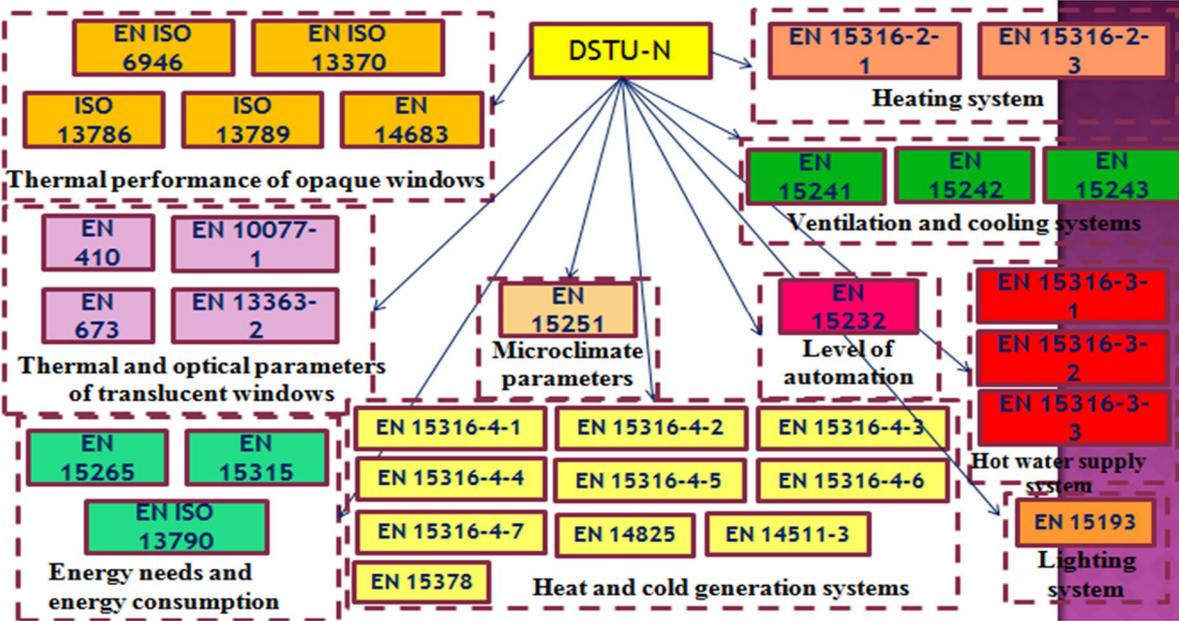
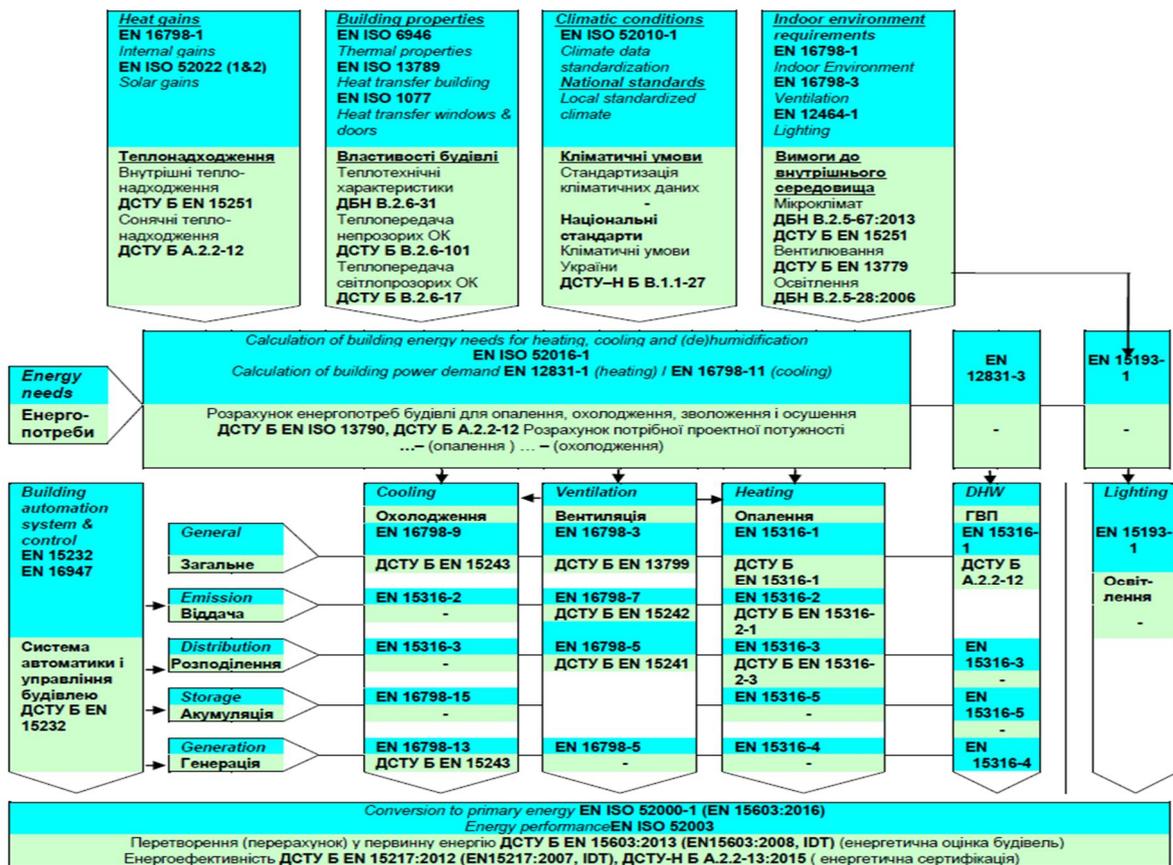


Figure 2 – The scheme of the project relationship DSTU B A.2.2-12: 2015 with European standards

According to DSTU-N B A. 2. 2-13: 2015, energy efficiency calculations are presented at different levels: energy consumption; energy consumption; energy delivered; primary energy/CO2 emissions. Standard DSTU B V. 2. 2-39: 2016 sets requirements for methods of energy audit of buildings (calculation, calculation and measurement, operational), their engineering systems, the composition of work, analysis of results, registration of reporting documentation. DBN B. 2. 5-67: 2013 sets requirements for engineering systems design, energy efficiency, safety, and environmental protection.

During the monitoring, EU standards were identified that determine the economic indicators of buildings, but are not valid in Ukraine (Table 1).

In General this is a General list of European and national energy efficiency standards for building engineering systems (Figure 3).



**Figure 3 – European and national energy efficiency standards for building engineering systems [1]**

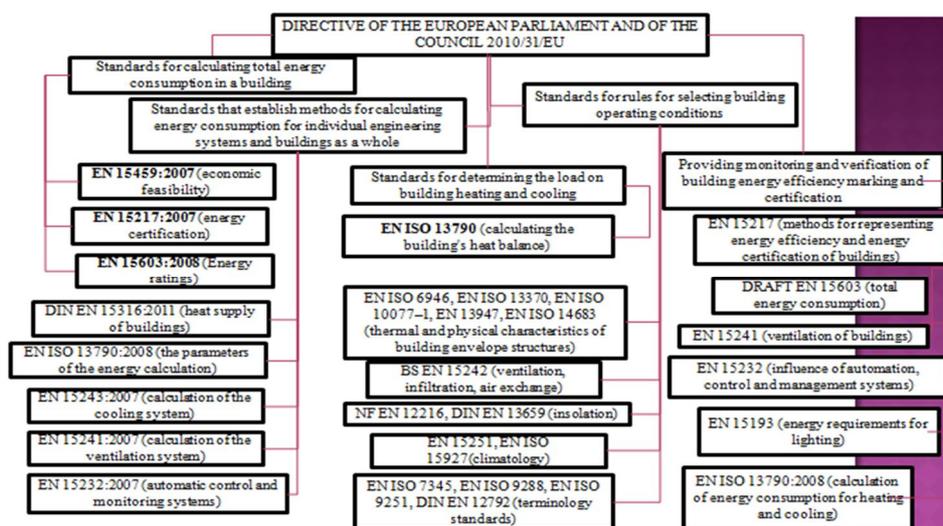
Taking into account the experience of European countries, in particular the system of existing norms and standards in the field of energy efficiency of buildings (Figure 4), the Law defines the main measures to improve the energy efficiency of buildings and tools for their financing. It is also planned to implement national plans to increase the number of buildings with close to zero energy consumption. The Law provides for the creation of open databases of energy certificates of buildings, reports on the results of surveys of engineering systems of buildings, and a list of certified energy auditors.

**Table 1.**

**EU standards that determine the economic performance of buildings, but are not valid in Ukraine**

Mandate M480, Mandate to CEN, CENELEC and ETSI for the elaboration and adoption of standards for a methodology calculating the integrated energy performance of buildings and promoting the energy efficiency of buildings, in accordance with the terms set in the recast of the Directive on the energy performance of buildings (2010/31/EU) of 14 th December 2010.
EPBD, Recast of the Directive on the energy performance of buildings (2010/31/EU) of 14 th December 2010.
CEN/TS 16628, Energy Performance of Buildings – Basic principles for the set of EPB standards, July 2014.

CEN/TS 16629, Energy Performance of Buildings – Detailed technical rules for the set of EPB standards, July 2014
ISO 13602-2, Technical energy systems – Methods for analysis – Part 2: Weighting and aggregation of energy wares.
EN ISO/IEC 17000, Conformity assessment – Vocabulary and general principles (ISO/IEC 17000:2004).
DIN V 18599 Energetische Bewertung von Gebäuden Berechnung des Nutz-, End- und Primärenergiebedarfs für Heizung, Kühlung, Lüftung, Trinkwarmwasser und Beleuchtung - Ausgabe 2017.
BPIE, 2014. Energy performance certificates across the EU. A mapping of national approaches. [pdf] Buildings Performance Institute Europe (BPIE).
CA EPBD, 2012. Country reports on EPBD Implementation. [pdf] Concerted Action. Energy Performance of Buildings Directive.
CA EPBD, 2014. Country reports on EPBD Implementation. Concerted Action. Energy Performance of Buildings Directive. [unpublished reports]
CA EPBD, 2014. Report on the interaction between Concerted Action EPBD and BUILD UP Skills: Towards improved quality in energy efficient buildings through better workers' skills and effective enforcement.
CEBC, 2006. Building Control Systems in Europe.
CTI, 2014. Attuazione della Certificazione Energetica degli edifici in Italia.
European Commission, 2015. A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy. COM/2015/080 final.
European Commission, 2015. A policy framework for climate and energy in the period from 2020 to 2030. COM/2014/015 final.
ISO 52000-1:2017 Energy performance of buildings - Overarching EPB assessment - Part 1: General framework and procedures
CEN ISO/TR 52000-2:2017 Energy performance of Buildings — Overarching EPB assessment – Part 2: Explanation and justification of ISO 52000-1, (in preparation).



**Figure 4 – System of current norms and standards in the field of energy efficiency of buildings in the European Union [2]**

As of today, Ukraine has implemented about 100 legal acts on energy efficiency and relevant systems of standards, regulatory and methodological documents, created a structure of state management and control in the field of energy conservation; introduced a system of

rationing of fuel and energy resources, energy audit and energy management, and state expertise on energy conservation. Appropriate sanctions have also been introduced for violations of legislation in the field of energy conservation.

### **References**

1. *Фаренюк Г.Г. Законодавча та нормативна база із забезпечення енергоефективності житлових та громадських будівель / Г.Г. Фаренюк // XIV Міжнародний конгрес «Інституційні та технічні аспекти реформування житлово-комунального господарства». Конференція: Публічний діалог влади, бізнесу та громадськості: «Енергоефективність та відновлювальна енергетика – запорука енергетичного та економічного розквіту України». – Київ, 07 листопада 2018 р.*
2. *Фаренюк Г.Г. Нове покоління норм з енергоефективності ДБН В.2.6-31:2016. Конструкції будинків і споруд. Теплова ізоляція будівель / Г.Г. Фаренюк. – Київ - 21.04.2017 р.*

Within the framework of a project EU Erasmus +: "The challenges of energy efficiency: cooperation of Ukraine with the EU", № 599740-EPP-1-2018-1-UA-EPPJMO-MODULE