



CONCERTED ACTION ENERGY PERFORMANCE OF BUILDINGS

EPBD implementation in Poland

Status in December 2016

AUTHORS

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NATIONAL WEBSITES

www.itb.pl, www.mib.gov.pl

1. Introduction

The Act on the Energy Performance of Buildings (published on 8 September 2014) entered into force on 9 March 2015, establishing the legal basis for further legislation regarding:

- the format of inspections of heating and AC systems protocols (17 February 2015);
- the scope and methodology of the verification of EPCs and heating and AC systems inspection reports (17 February 2015);
- the methodology for the energy assessment of buildings and their parts, as well as for EPCs (27 February 2015);
- the obligatory civil liability insurance of persons issuing EPCs (21 April 2015);
- the national action plan for increasing the number of NZEB (22 June 2015).

Moreover, the act further established a "Central Register of the Energy Performance of Buildings"¹, which includes databases of:

1. persons authorised to produce EPCs;
2. persons entitled to inspect heating or AC systems;
3. EPCs;
4. protocols for heating or AC system inspections;

5. buildings with floor area exceeding 250 m² occupied by the judicial authorities, the prosecutor's office and public authorities that serve the public directly.

The databases mentioned under 1, 2 and 5 are made publicly available via the website², providing easy access to data of experts who draw up EPCs and perform inspections of heating and AC systems.

Together with building codes, the listed regulations and the five databases form the main framework for the implementation of the EPBD in Poland.

2. Current Status of Implementation of the EPBD

2.1. Energy performance requirements: NEW BUILDINGS

According to the regulation concerning the technical conditions that buildings must meet, the energy performance requirements for new buildings apply both to the fabric of the building itself and to its heating, ventilation and AC and domestic hot water systems, as well as, in the case of public, collective (buildings for temporary residence, e.g., hotel, dormitory, prison, etc.), industrial, storage and livestock buildings to their built-in lighting system. The buildings need to be designed and constructed so as to meet the following minimum requirements:

1. A maximum energy performance index value [kWh/(m²·year)], which determines the annual non-renewable energy demand for space heating, ventilation, cooling and domestic hot water and, for collective, industrial, storage and livestock buildings, also for built-in lighting. This energy performance index is to be calculated according to the regulation that applies to the calculation methodology for the energy performance of buildings and must be lower than the value calculated for the building using the formula in §329 p.1 or 3 of the regulation. The use of maximum values for parts of the energy performance index is mentioned in §329 p.2 for the space heating, ventilation, domestic hot water and space cooling as well as built-in lighting.

$$EP = EP_{H+W} + \Delta EP_C + \Delta EP_L; \text{ [kWh/(m}^2\text{·year)]}, \text{ [§ 329 p.1]}$$

$$EP = \sum_i (EP_i \cdot A_{f,i}) / \sum_i A_{f,i}; \text{ [kWh/(m}^2\text{·year)]}, \text{ [§ 329 p.3]}$$

where:	<p>EP_{H+W} – maximum values for parts of the energy performance index for heating, ventilation and domestic hot water</p> <p>ΔEP_C – maximum values for parts of the energy performance index for cooling</p> <p>ΔEP_L – maximum values for parts of the energy performance index for built-in lighting</p> <p>$A_{f,i}$ – floor area heated or cooled of i-part of unified utility function of building</p>
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2. Individual elements of the building envelope and buildings technical systems must at least meet the requirements of thermal insulation specified in Annex 2, and the window area corresponds to the requirements specified in §2.1. Annex 2.

Buildings must be further designed and constructed in a way to avoid overheating during the summer period.

A detailed description of the regulation (as of March 2015) is given in Tables 1 – 5.

Building category	EP _{H+W} max	
	Obligatory from 1 st January 2017	Obligatory from 1 st January 2021* (NZEB level)
Residential building:	95	70
- single-family house	85	65
- multi-family house		
Hotels and dormitory	85	75
Non-residential building:	290	190
- health care building	60	45
- other		
Industrial, heated storage and livestock buildings	90	70
* In case of buildings occupied and owned by public authorities, obligatory from 1 st January 2019		

Table 1. Maximum permissible values of primary energy for heating, ventilation and domestic hot water (EP_{H+W}) [kWh/(m²·year)].

Building category	ΔEP _C max	
	Obligatory from 1 st January 2017	Obligatory from 1 st January 2021* (NZEB level)
Residential building:	ΔEP _C = 10 · A _{f,C} /A _f	ΔEP _C = 5 · A _{f,C} /A _f
- single-family house		
- multi-family house		
Hotels and dormitories	ΔEP _C = 25 · A _{f,C} /A _f	ΔEP _C = 25 · A _{f,C} /A _f
Non-residential building:		
- health care building		
- other		
Industrial, heated storage and livestock buildings		
Where:	A _f — area of heated rooms in a building [m ²], A _{f,C} — area of cooled rooms in a building [m ²]. * In case of buildings occupied and owned by public authorities, obligatory from 1 st January 2019	

Table 2. Maximum permissible values of Δprimary energy for cooling] (EP_C) [kWh/(m²·year)].

Building category	$\Delta EP_{L \max}$	
	Obligatory from 1 st January 2017	Obligatory from 1 st January 2021* (NZEB level)
Residential building: - single-family house - multi-family house	$\Delta EP_L = 0$	$\Delta EP_L = 0$
Hotels and dormitories	for $t_0 < 2500$ $\Delta EP_C = 50$	for $t_0 < 2500$ $\Delta EP_C = 25$
Non-residential building: - health care building - other	for $t_0 \geq 2500$ $\Delta EP_C = 100$	for $t_0 \geq 2500$ $\Delta EP_C = 50$
Industrial, heated storage and livestock buildings		

Where: t_0 – operating time of built-in lighting installation [h/a].

* In case of buildings occupied and owned by public authorities obligatory from 1st January 2019

Table 3. Maximum permissible values of Δ primary energy for lighting (EP_L) [kWh/(m²·year)].

Fabric element and internal temperature in the room		Maximum U-value [W/(m ² ·K)]	
		Obligatory from 1 st January 2017	Obligatory from 1 st January 2021* (NZEB level)
External walls	a) $t_i \geq 16^\circ\text{C}$ b) $8^\circ\text{C} \leq t_i < 16^\circ\text{C}$ c) $t_i < 8^\circ\text{C}$	0,23 0,45 0,90	0,20 0,45 0,90
Internal walls	a) in case of $\Delta t_i \geq 8^\circ\text{C}$ and separating heating rooms of corridors and staircases b) in case of $\Delta t_i < 8^\circ\text{C}$ c) separating heated and unheated rooms	1.00 no requirements 0.30	
Walls adjacent to dilatation joints width	a) to 5 cm b) more than 5 cm	1.00 0.70	
Walls of unheated underground rooms		no requirements	
Roofs, flat roofs and floors in contact with outdoor air	a) $t_i \geq 16^\circ\text{C}$ b) $8^\circ\text{C} \leq t_i < 16^\circ\text{C}$ c) $t_i < 8^\circ\text{C}$	0,18 0,30 0,70	0,15 0,30 0,70

Fabric element and internal temperature in the room		Maximum U-value [W/(m ² ·K)]
Roofs on the ground	a) $t_i \geq 16^\circ\text{C}$	0.30
	b) $8^\circ\text{C} \leq t_i < 16^\circ\text{C}$	1.20
	c) $t_i < 8^\circ\text{C}$	1.50
Floors over unheated and closed spaces	a) $t_i \geq 16^\circ\text{C}$	0.25
	b) $8^\circ\text{C} \leq t_i < 16^\circ\text{C}$	0.30
	c) $t_i < 8^\circ\text{C}$	1.00
Floors over heated rooms	a) in case of $\Delta t_i \geq 8^\circ\text{C}$	1.00
	b) in case of $\Delta t_i < 8^\circ\text{C}$	no requirements
	c) separating heated rooms from unheated	0.25

t_i – Room temperature heated in accordance with § 134 sec. 2 of the regulation

* In case of buildings occupied and owned by public authorities, obligatory from 1st January 2019

Table 4. Permissible values of thermal insulation for opaque building elements.

Type of window or door	Maximum U-value [W/(m ² ·K)]	
	Obligatory from 1 st January 2017	Obligatory from 1 st January 2021* (NZEB level)
Vertical windows, balcony doors and transparent walls:		
1. $t_i \geq 16^\circ\text{C}$	1.1	0.9
2. $t_i < 16^\circ\text{C}$	1.6	1.4
Roof windows:		
1. $t_i \geq 16^\circ\text{C}$	1.3	1.1
1. $t_i < 16^\circ\text{C}$	1.6	1.4
Windows in internal walls:		
1. in case of $\Delta t_i \geq 8^\circ\text{C}$	1.3	1.1
2. in case of $\Delta t_i < 8^\circ\text{C}$	no requirements	no requirements
1. separating heated rooms from unheated	1.3	1.1

t_i – Room temperature heated in accordance with § 134 sec. 2 of the regulation

* In case of buildings occupied and owned by public authorities, obligatory from 1st January 2019

Table 5. Permissible values of thermal insulation for transparent building elements.

2.1.i. Progress and current status of new buildings

The energy performance requirements entered into force on 1 January 2014, and determined obligatory minimum requirements for new buildings constructed³ from 1 January 2017, and 1 January 2019 in the case of buildings occupied and owned by public authorities, and from 1 January 2021 for all buildings (dates refer to building permit).

A detailed description of the regulation is given in the relevant country report of the CA EPBD Book 2016.

2.1.ii. Format of national transposition and implementation of existing regulations

A detailed description of the current regulation for new buildings is given in the relevant country report of the CA EPBD Book 2016.

The current methodology is described in the Regulation on the methodology for the energy assessment of buildings and their parts, as well as for EPCs. The calculation leads to the determination of the index of annual non-renewable primary energy demand (EP) in kWh/(m²·year), which is necessary to check minimum requirements. Non-renewable primary energy factors are given in the regulation (Table 6).

#	Energy supply source for buildings	Energy carrier	Non-renewable prime energy factors
1	Local energy production in building	Heating oil	1.10
2		Natural gas	
3		Liquid gas	
4		Coal	
5		Lignite	
6	Solar energy	Solar energy	0.00
7		Wind energy	
8		Geothermal energy	
9	Biomass	Biomass	0.20
10		Biogas	
11	District heating from cogeneration	Coal or natural gas	0.80
12		Biomass or biogas	
13	District heating	Coal	1.30
14		Gas or heating oil	
15	Grid electricity	Electricity	3.00

Table 6. Values of correction factors (W_i) for non-renewable energy demand, for production and transfer of energy carriers.

The methodology also includes other values describing the energy performance of buildings:

- the index of annual demand for final energy (EK) in kWh/(m²·year);
- the index of annual energy needs (EU) in kWh/(m²·year);
- the index of CO₂ emissions;
- the share of RES in the annual demand for final energy.

The general calculations of energy demand for heating, cooling and ventilation are based on methods from CEN standards (e.g., EN ISO 13790 and other linked standards).

In June 2016, the Ministry of Infrastructure and Construction issued the "Guide to Improve the Energy Performance of Buildings"⁴ (Figure 1). The guide describes the evolution of energy performance regulations in Poland. On the basis of multiple examples, it shows how to improve the energy performance of buildings. Moreover, the guidebook reveals national and regional incentives which support energy performance actions.

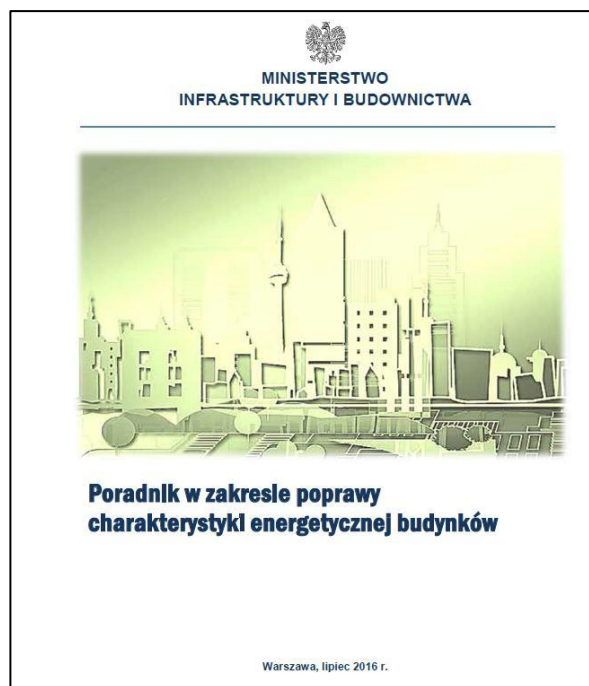


Figure 1. Cover of the "Guide to Improve the Energy Performance of Buildings"

2.1.iii. Action plan for progression to NZEB for new buildings

The national plan for increasing the number of buildings with low energy consumption was adopted on 22 June 2015. The plan pays particular attention to the definition of NZEB and their specific characteristics, includes important information and tips for investors, designers and contractors, and describes the main and intermediate objectives related to improving the energy efficiency of buildings, including a timetable for achieving them in accordance to Article 9 §3 of the EPBD. The characteristic actions, mainly of government measures taken to promote buildings with low energy consumption, include the design,

construction and reconstruction of buildings in a way that ensures their energy efficiency and increases the share of energy from RES in new and existing buildings. In addition, this document discusses the changes in regulations affecting the energy efficiency of buildings, making note of financial mechanisms addressed to different groups of beneficiaries, e.g., housing communities, individuals, local authorities, businesses and others.

The national plan also sets out plans for promoting the use of RES in buildings and the need to improve the technical conditions of the existing building stock. It identifies aspects of a comprehensive approach to energy efficiency, and its main objective is to achieve the provisions of Article 9 §1 of the EPBD.

Following the aims of the directive, the goals are set as follows:

- by 31 December 2018, all new buildings occupied by public authorities or owned by the government should be NZEB;
- by 31 December 2020, all new buildings should be NZEB.

2.1.iv. Requirements for systems and / or building components for new buildings

A detailed description of the current regulations for new buildings is given in in the relevant country report of the CA EPBD Book 2016.

According to the regulation on the technical conditions that new buildings must meet, the main requirements include:

- maximum values of thermal transmittance of individual elements of the building envelope: walls, roofs, floors, windows, doors and others types of partitions;
- recommended airtightness of envelope and threshold values for the air leakage of windows and balcony doors;
- the maximum area of transparent parts of the building envelope with a thermal transmittance ≥ 0.9 W/m².K;
- minimal thermal insulation of pipes and components in space heating and cooling, as well as in domestic hot water systems;
- the maximum values of specific fan power of fans used in AC and mechanical ventilation systems.

In general, heating, domestic hot water, lighting, ventilation and AC equipment used in the systems shall fulfil requirements set by separate national regulations which implement other European directives, e.g., eco-design, etc.

2.II. Energy performance requirements: EXISTING BUILDINGS

2.II.i. Progress and current status of existing buildings

The previously mentioned requirements for new buildings also apply to the renovation of existing buildings. Article 1 of the regulations on technical requirements for building works specifies that minimum requirements for renovated buildings are fulfilled when walls and building technical systems correspond to

the requirements of thermal insulation specified in Annex 2 of the regulation, and the window area corresponds to the requirements specified in §2.1 of Annex 2 (Tables 1 - 5).

2.II.ii. Plans to improve the existing building stock

The national plan sets out actions for promoting the use of RES in buildings and the need to improve the technical condition of the existing building stock. It identifies aspects of a comprehensive approach to energy efficiency, and its main objective is to achieve the provisions of Article 9, §1 of the EPBD.

The national plan includes, among other topics, the definition of buildings with low energy consumption and their specific characteristics, as well as government actions to promote buildings with low energy consumption. It focuses on the design, construction and reconstruction of buildings to ensure energy efficiency and to increase the share of energy from RES in both new and existing buildings (combined with programmes for thermal modernisation and the promotion of a low-emission economy). The national plan sets a timeline for achieving these goals, which corresponds to Article 9, §3 of the EPBD.

2.II.iii. Regulation of system performance, as distinct from whole building performance

With regard to certain elements of heating, domestic hot water and cooling systems, one of the key areas covered by the regulation is the limitation of heat loss from pipes, which has to be kept below a reasonable maximum level. Specific minimum technical requirements on thermal insulation of pipes and components are given in Table 7.

#	Pipe or component	Minimum thickness of thermal insulation (material $\lambda = 0.035 \text{ W/m}\cdot\text{K}$) [mm]
1	$d_i < 22 \text{ mm}$	20
2	$22 \leq d_i < 35 \text{ mm}$	30
3	$35 \leq d_i < 100 \text{ mm}$	equal to the diameter d_i
4	$100 \leq d_i$	100
5	Pipes passing through walls or ceilings, cross of pipes	50% of the thickness given in rows 1 ÷ 4
6	Pipes in heating systems in the walls separating different uses	50% of the thickness given in rows 1 ÷ 4
7	Pipes according to row 6 embedded in the floor	6
8	Pipes of air heating (inside of the heated area of the building)	40
9	Pipes of air heating (outside of the heated area of the building)	80
10	Pipes of chilled water cooling (inside the building)	50% of the thickness given in rows 1 ÷ 4
11	Pipes of chilled water cooling (outside the building)	As given in rows 1 ÷ 4

Table 7. Requirements on thermal insulation of pipes and components in heating, hot water and cooling systems.

The ordinance also provides performance requirements for the maximum level of specific fan power of fans used in AC and mechanical ventilation systems, as shown in Table 8. The specific fan power can be increased when certain elements are used in the system (Table 9). Generally, heating, domestic hot water, lighting, ventilation and AC equipment used in the systems shall further fulfil requirements set by separate national regulations which implement other European directives, e.g., eco-design, etc. The provisions of the ordinance are applicable to related technical building systems in both the design of new buildings and the renovation of existing buildings.

# Type and application of fan	Specific Fan Power SFP [kW/(m ³ /s)]
1 Supply fan:	
a) air-conditioning system or supply and exhaust ventilation with heat recovery	1.60
b) supply and exhaust ventilation without heat recovery and supply ventilation	1.25
2 Exhaust fan:	
a) air-conditioning system or supply and exhaust ventilation with heat recovery	1.00
b) supply and exhaust ventilation without heat recovery and supply ventilation	1.00
c) exhaust system	0.80

Table 8. Performance requirements on the maximum level of specific fan power (SFP) of fans used in air-conditioning and mechanical ventilation systems.

# Additional element of ventilation or air-conditioning system	Additional SFP [kW/(m ³ /s)]
1 Additional filtration level	0.3
2 Additional filtration level with filter class H10 or higher	0.6
3 Gaseous contaminants filters	0.3
4 High efficiency heat recovery device (temperature effectiveness higher than 90%)	0.3

Table 9. Elements of the systems that allow to increase the specific fan power (SPF).

2.II.iv. Encouragement of intelligent metering

As of today, the Ministry of Energy is preparing regulations for setting the legal framework and the technical installation of remote meter reading and processing of collected data. Some steps in implementing advanced metering infrastructure (AMI) have already been taken, however, they do not have a systematic nature. These are the activities of individual energy companies and relate to pilot programmes involving the installation of remote meter reading.

2.II.v. Financial instruments and incentives for existing buildings

The main measures to support investment in the energy efficiency of existing buildings include:

- The Thermo-modernisation Fund⁵, funded through the state budget. The main objective of the fund is to provide financial assistance for projects to improve the condition of existing housing. Supported actions must lead to a reduction in energy consumption for heating and domestic hot water, including the reduction of losses of energy in local heating networks, or the exchange of heating sources for more efficient alternatives.
- The Green Investment Scheme⁶ for the energy management in public buildings. This supports projects that improve energy efficiency and reduce CO₂ emissions through measures such as building insulation, replacement of windows and exterior doors, replacement of the heating source, replacement of heating, ventilation and AC systems, the use of energy management systems in buildings and the use of RES technologies.
- The Operational Programme Infrastructure and Environment 2014-2020 from the European Regional Development Fund and the Cohesion Funds - Promotion of energy efficiency, intelligent power management and the use of RES in public infrastructures. The funds are earmarked for the deep, complex thermo-modernisation of energy, based on a system of energy management. Elements subject to funding under the programme include an energy audit, the insulation of the building envelope, replacement of the heating source, replacement of windows and exterior doors, and the use of automatic regulation to weather conditions.

2.II.vi. Information campaigns / complementary policies

The activities taken by Poland aimed at promoting energy efficiency in buildings include:

- "The House, Which Saves for Me" campaign, conducted by the Ministry of the Environment⁷.
- Certain information and educational campaigns related to RES, e.g., the "Operational Programme Knowledge Education Development (POWER)", in the financial perspective for 2014-2020 taken by the Ministry for the Economy on basis of the law of 20 February 2015. POWER is a two-tier operational programme addressing the need for reforms in the areas of employment, social inclusion, education, health and good governance, and providing direct support in areas where support at a national level is justified by objective considerations.
- Actions by educational faculties to increase research capacity in the scope of environmental technologies.
- The "Guide to Improve the Energy Performance of Buildings"⁸, developed on March 2016 by the Ministry of Infrastructure and Construction. The guide is aimed at a wide range of customers, including owners and users of buildings or their parts, investors, building managers, local government units, building contractors, architects, engineers, people authorised to draw up EPCs and inspect heating and AC systems, and energy auditors.

In addition, there are many other organisations, associations, institutions, etc., that provide services of information and consultancy to promote energy conservation issues.

2.III. Energy performance certificate requirements

2.III.i. Progress and current status on sale or rental of buildings and EPCs

Overview and administration system

The energy performance certification system is governed and administered by the Ministry of Infrastructure and Construction.

On the basis of the Act on Energy Performance of Buildings, there is a central register of the energy performance of buildings⁹. This register contains five databases, mentioned in the introduction to this document.

Every EPC in Poland has to be prepared/submitted with the use of this register. EPCs should be issued every time the building or building unit is sold or offered for rent.

Format and content of the EPC

The ordinance of 27 February 2015 specifies the basic requirements, the calculation methodology and the format of the EPCs (Figure 2), as described in the relevant country report of the CA EPBD Book 2016.

WZÓR ŚWIADECTWA CHARAKTERYSTYKI ENERGETYCZNEJ BUDYNKU

ŚWIADECTWO CHARAKTERYSTYKI ENERGETYCZNEJ BUDYNKU			
Numer świadectwa ¹⁾			
Oceniany budynek			
Rodzaj budynku ²⁾		Zdjęcie budynku	
Przeznaczenie budynku ³⁾			
Adres budynku			
Budynek, o którym mowa w art. 3 ust. 2 ustawy ⁹⁾			
Rok oddania do użytkowania budynku ⁴⁾			
Metoda wyznaczania charakterystyki energetycznej ⁶⁾			
Powierzchnia pomieszczeń o regulowanej temperaturze powietrza (powierzchnia ogrzewana lub chłodzona) A_f [m ²] ⁷⁾			
Powierzchnia użytkowa [m ²]			
Ważne do (rrrr-mm-dd) ⁸⁾			
Stacja meteorologiczna, według której danych jest wyznaczana charakterystyka energetyczna ⁹⁾			
Ocena charakterystyki energetycznej budynku¹⁰⁾			
Wskaźniki charakterystyki energetycznej	Oceniany budynek	Wymagania dla nowego budynku według przepisów techniczno-budowlanych	
Wskaźnik rocznego zapotrzebowania na energię użytkową	EU = ... kWh/(m ² · rok)		
Wskaźnik rocznego zapotrzebowania na energię końcową ¹¹⁾	EK = ... kWh/(m ² · rok)		
Wskaźnik rocznego zapotrzebowania na nieodnawialną energię pierwotną ¹¹⁾	EP = ... kWh/(m ² · rok)	EP = ... kWh/(m ² · rok)	
Jednostkowa wielkość emisji CO ₂	E _{CO₂} = ... t CO ₂ /(m ² · rok)		
Udział odnawialnych źródeł energii w rocznym zapotrzebowaniu na energię końcową	U _{ren} = ... %		
Wskaźnik rocznego zapotrzebowania na nieodnawialną energię pierwotną EP [kWh/(m² · rok)] 			
Obliczeniowa roczna ilość zużywanego nośnika energii lub energii przez budynek¹²⁾			
System techniczny	Rodzaj nośnika energii lub energii	Ilość nośnika energii lub energii	Jednostka/(m² · rok)
Ogrzewania	1) n)		
Przygotowania ciepłej wody użytkowej	1) n)		
Chłodzenia	1) n)		
Wbudowanej instalacji oświetlenia ¹³⁾	1) n)		
Sporządzający świadectwo:			
Imię i nazwisko:			
Nr wpisu do wykazu ¹³⁾ :			
Data wystawienia świadectwa:		Podpis i pieczęć	

Figure 2. Template of EPC.

EPC activity levels

According to the data of the General Office of Building Control, in the period between 1 January 2009 and 8 March 2015, a total of 541,193 new buildings were completed and handed over to occupants, each of which would have had an EPC. All would still be valid.

Moreover, in the same period, there were 26,114 multi-family buildings put into use. This number represents an additional several hundred thousand EPCs for the associated individual houses.

As mentioned, every EPC in Poland has to be prepared with the use of the national register. At the beginning of 2017, around 100,000 EPCs had been issued since 9 March 2015.

Typical EPC costs

The price of the EPC is fully market driven. The lowest prices offered in the publicly available transaction service are 40 €, whereas the highest price offer for buildings of a complicated structure exceeds 1,300 €. The typical price for an EPC for an apartment or a single-family building ranges between 50 € and 150 €. For a multi-occupancy apartment building, the typical price ranges between 200 € and 500 €.

Assessor corps

According to the Act on Energy Performance of Buildings, an EPC may be issued only by a qualified expert.

Since 9 March 2015, every qualified expert has to be registered in the relevant database of the central register of the energy performance of buildings. On 9 January 2017 there were 13,368 registered qualified experts.

Compliance levels by sector

The EPC and its compliance with the energy performance levels is checked on the basis of data from the central register. According to this data, new and renovated buildings comply with the minimum levels enforced by Polish law. Values of annual primary energy consumption from registered EPCs are shown in Figures 3 and 4.

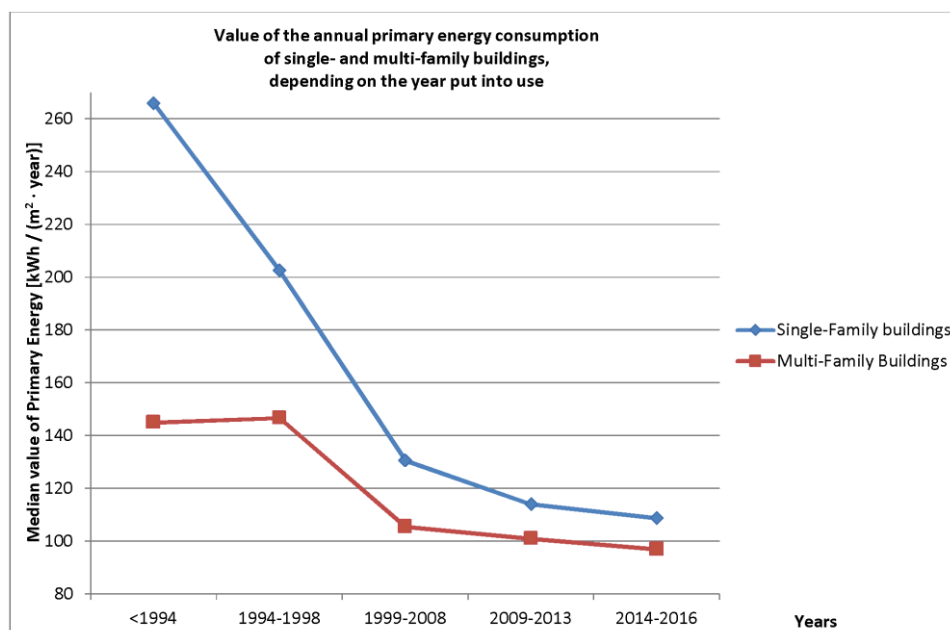


Figure 3. Value of the annual primary energy consumption of single- and multi-family buildings, depending on the year put into use.

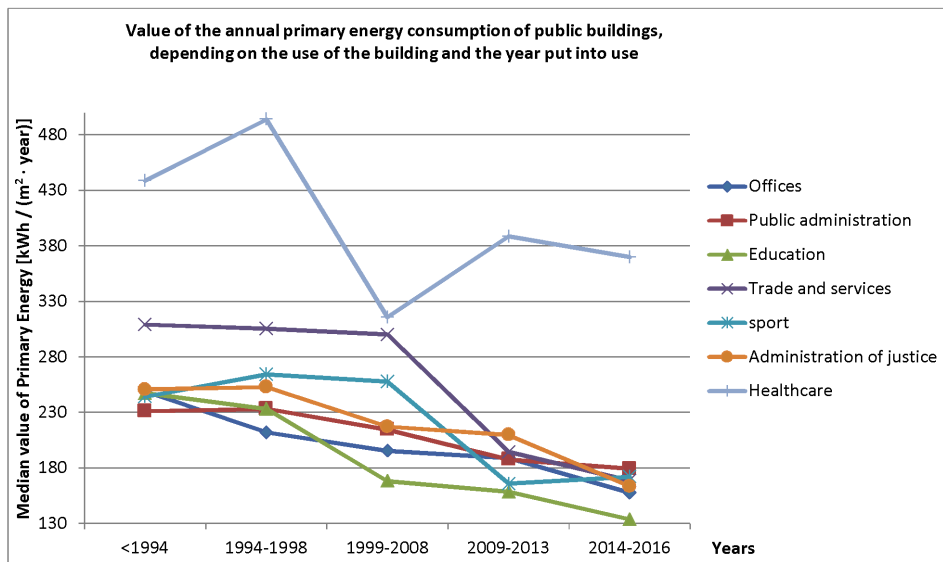


Figure 4. Value of the annual primary energy consumption of public buildings, depending on the use of the building and the year put into use.

Enforcement with building owners and real estate actor

An EPC is required in every instance where the property is subject to a change of ownership, is sold or rented.

In the case of sale or rent, according to the Act on Energy Performance of Buildings, the owner should hand over the EPC to the buyer or tenant. If the EPC is not transferred, the buyer or tenant has the right to call on the owner to fulfil their obligations and may request the EPC at the expense of the owner. The buyer or tenant may not waive these rights. The owner and the buyer are informed about their rights by a notary while signing the notary deed.

2.III.ii. Quality Assurance of EPCs

Since March 2015, there is a direct mechanism of quality assurance of EPCs in Poland, used on the basis of the central register of the energy performance of buildings. EPCs are quality controlled *ex officio* or by request. So far, less than 10 EPCs have been controlled upon a request. The number of EPCs controlled *ex officio* in the period 2015 - 2016 is 180. Following these controls, 14 qualified experts lost their authorisation. Comparatively, before 2015, three (3) qualified experts had lost their authorisation.

During control, checks are made, among other factors, on:

- calculation results;
- efficiency of technical building systems and U-values compared with requirements concerning thermal insulation of the building envelope components;
- energy demand indicators, energy consumption and categories of cost-effective recommendations, correctness of description, etc.

There are no penalties foreseen for minor faults. Fault tolerance may reach up to 10%, depending on where the error was made.

In cases of intentional adoption of incorrect technical assumptions (e.g., improving the indicators of energy demand) there is no tolerance of errors.

There are also penalties for drawing up EPCs without the necessary qualifications, or without liability insurance for damages caused in connection with the preparation of an EPC.

Moreover, according to the Act on Energy Performance of Buildings as well as the civil law, an EPC containing false data on energy use is considered a product with a physical failure. Potential conflicts between the qualified expert and the client in this matter will be settled in court.

Proposals to improve the central register of EPCs are currently being prepared. Following their introduction, it will be possible to check the correctness of EPCs more quickly and easily.

2.III.iii. Progress and current status of EPCs on public and large buildings visited by the public

The certification process for public buildings, or for large buildings visited by the public, falls under the same regulations as for other buildings. According to the Act on Energy Performance of Buildings, the EPC shall be visible to the public in the case of buildings (> 250 m²) used by justice authorities, the prosecutor's office, or for public buildings to which the public have access.

The template of the EPC for these buildings is the same as the one used for other buildings. EPCs for these buildings are issued by the same group of experts as EPCs for buildings that are being sold. Also, the provisions on quality assurance are the same as those described above.

The fifth database of the publicly available central register shows, on the basis of issued EPCs in Poland, information about these buildings (among other things, the parameters of the energy performance, the share of RES, the value of CO₂ emissions, etc.).

2.III.iv. Implementation of mandatory advertising requirement - status

According to the Act on Energy Performance of Buildings, the mandatory advertising requirements derived from the EPBD have been implemented into Polish law. According to these rules, the energy performance indicator from the EPC has to be included in both sale and rental advertisements (for every kind of building).

The Polish legal framework requires the publication of selected EPC information (the value of final energy is obligatory); however, the advertisements sometimes provide additional information, e.g., about numerical values of CO₂ emissions, the share of RES, or the heat transfer coefficient. This is more common for the sale of new single-family houses.

At the same time, there is still a relatively low level of interest from consumers and building owners in the EPC and energy data. The main criterion for choosing a house or apartment is not the low-energy level of the building, but location and price.

2.IV. Inspection requirements - heating systems, air conditioning

2.IV.i. Report on equivalence of model A and B for Heating Systems

Poland adopted the regular inspection of heating and AC systems. Regulations and requirements are specified in the Construction Act and in the Act on Energy Performance of Buildings. These laws state that building owners or managers are obliged to carry out a periodic inspection of the technical condition of a building's heating and AC system and their power adjustment concerning heating or cooling needs.

Reports issued after 9 March 2015 must be registered in the relevant database of the central register (for now 1,200 reports for heating systems and 400 reports for AC systems have been submitted) and are randomly chosen for verification.

2.IV.ii. Progress and current status on heating systems

According to the Act on the Energy Performance of Buildings now in force, periodic inspections must be performed:

- at least every 2 years for boilers of an effective rated output over 100 kW using liquids or solid fuels;
- at least every 4 years for boilers of an effective rated output over 100 kW using gas;
- at least every 5 years for boilers of an effective rated output between 20 kW and 100 kW.

Inspections of the heating system include an assessment of the efficiency of these systems and their adaptation to the demands of the building and its users.

There shall be no control of heating systems where no changes that would affect their energy efficiency were made after the previous inspection.

Inspections of heating and AC systems in buildings can be performed by a person who has:

- building qualifications in installation or;
- the qualifications required for supervision during the operation of equipment which produce, process, transform and consume heat and other power equipment.

2.IV.iii. Progress and current status on AC systems

According to the Act on the Energy Performance of Buildings, AC systems with a rated output over 12 kW should be inspected periodically and at least once every five years.

Inspections of the AC system include an assessment of the efficiency of these systems and their adaptation to the demands of the building and its users.

Requirements for inspectors of AC systems are similar to those for heating systems described under IV.ii. The person entitled to do periodical inspections must be included in the relevant database of the central register (Figure 5).

Wszystko ZIO	Numer wpisu	Data wpisu	Imię	Nazwisko	Numer uprawnień budowlanych
<input type="checkbox"/>	warunek: równe wartość: []	1 2015-03-10	Andrzej	Lewandowski	LE50049-POO508
<input type="checkbox"/>		2 2015-03-10	Andrzej	Dziżyński	S-10785
<input type="checkbox"/>		3 2015-03-10	Szymon	Bieniek	343-126-2D-2013
<input type="checkbox"/>		4 2015-03-10	Ireneusz	Matusiak	927D0213
<input type="checkbox"/>		5 2015-03-13	Miroslaw	Gruszkowski	GP-K2-7342/200/92
<input type="checkbox"/>		6 2015-03-13	Krzysztof	Konecki	G-2D/033135/12
<input type="checkbox"/>		7 2015-03-13	Daniel	Plak	G-2D/033137/12
<input type="checkbox"/>		8 2015-03-13	Jerzy	Słota	D/636/178/Rz/2010
<input type="checkbox"/>		9 2015-03-13	Leszek	Kaczanowski	242/999ZD/2014
<input type="checkbox"/>		10 2015-03-13	Michał	Cerajewski	D/064/101/13

Jest 1 209 rekordów na liście (Użyj listy)

ver. 1.5.2

Figure 5. Central registry of the Ministry of Infrastructure and Construction.

2.IV.iv. Enforcement and impact assessment of inspections

Enforcement and penalties

Failure to carry out an inspection may result in a fine for the owner or manager of the building, in accordance with Article 93 point 8 of the construction act. Currently, there is no data concerning penalties issued by construction supervision authorities. Judgement on the issues shall be made on the basis of the provisions of the code of conduct in misdemeanour cases. The fine is up to 500 PLN (around 120 €) and is imposed by construction supervision authorities.

From 9 March 2015, in accordance with the Act on the Energy Performance of Buildings, failing to perform an inspection process, or carrying out the inspection without qualifications, will result in a fine for the owner, the manager of the building, or the expert. The verification of inspection outcomes is made *ex officio* or by request of the building owner/manager.

Quality control of inspection reports

An ordinance of the Minister of Infrastructure and Development, dated 17 February 2015, on the model protocols of inspection of a heating or AC system specifies that inspections:

- apply not just to the technical condition and energy efficiency of boilers, but to the whole heating system; and
- must contain more than a statement concerning proper functioning.

There is a fixed detailed audit scope, including measurements, as well as testing and control, which ends with a protocol containing five pages.

The protocols of the inspection of a heating or AC system shall be drawn up using the communication system, which is in the central register of the energy performance of buildings.

The person conducting the inspection shall provide to the person ordering the control a printed protocol with an appropriate number given by the ICT system.

Impact assessment. Costs and benefits.

The price for inspection is not fixed. The cost depends on the area of the building, where 1 m² equates to around 1 PLN (about 0.22 €).

In accordance with the Construction Act, the protocol of inspections of heating and AC systems should be included in the construction site book, both for existing and new buildings. The authority in charge of the database with inspection protocols is the Ministry of Infrastructure and Construction.

The reports are registered in the relevant database of the central register and they are randomly drawn for verification.

3. A success story in EPBD implementation

The introduction of coherent energy efficiency regulations in line with the EPBD succeeded in increasing the number of energy efficient buildings in Poland and in raising public awareness.

The regulation of the Minister of Infrastructure of 12 April 2002 on the technical conditions that buildings and their locations must meet set minimum energy performance requirements for new buildings as well as for those undergoing renovations.

The Act on the Energy Performance of Buildings specified principles for the preparation and transfer of EPCs, as well as inspection principles for heating systems and AC systems in buildings. It set out documentation for their control, as well as requirements for persons qualified to issue EPCs and perform inspections of heating and AC systems in buildings.

The "Guide to Improve the Energy Performance of Buildings" released in June 2016 by the Ministry of Infrastructure and Construction, is a publicly available guidebook which offers significant support and advice in energy efficient construction to a wide range of customers, including owners, users of buildings and many others. The publication describes the evolution of energy performance regulations in Poland and, on the basis of multiple case studies, shows how to improve the energy performance of new and existing buildings. Moreover, the guidebook reveals national and regional incentives which support energy performance actions.

4. Conclusions, future plans

In accordance with Article 4 of the EPBD, the minimum energy performance requirements (included in the national legislation) are currently being reviewed to reflect the technical progress in the building sector.

Future actions are being considered, relating to the improvement of the central register for the energy performance of buildings. Plans include a further improvement of the quality of EPCs and heating and AC systems inspection protocols (including administrative simplification and quality assurance), and the addition of a supplementing section on reports and statistics which will allow collecting data pertaining to the building stock for the purpose of supporting decision-making.

Endnotes

1. <https://rejestrceb.mib.gov.pl/wykazy>
2. <https://rejestrceb.mib.gov.pl/wykazy>. The website is administered by the Ministry of Infrastructure and Construction (<http://mib.gov.pl/>).
3. With a building permit issued after these dates.
4. <http://mib.gov.pl/files/0/1797054/poradnik.pdf>
5. www.bgk.pl/osoby-fizyczne/fundusz-termomodernizacji-i-remontow/
6. www.nfosigw.gov.pl/oferta-finansowania/system-zielonych-inwestycji---gis/programy-priorytetowe/
7. www.oszczedzam-energie.mos.gov.pl
8. <http://mib.gov.pl/files/0/1797054/poradnik.pdf>
9. <https://rejestrceb.mib.gov.pl/wykazy>



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