

National plan for increasing the number of nearly zero energy buildings in Poland



National plan for increasing the number of nearly zero-energy buildings in Poland

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1 Starting point

Please give a short overview of your national building stock. Describe the most important characteristics and emerging needs. Additionally, illustrate the chronological development of national requirements on the energy performance of buildings (for an example, see guidance document)

Existing buildings

According to the data from the Central Statistical Office (Główny Urząd Statystyczny), the age structure of buildings and housing resources in Poland is presented in Table 1. It is estimated that by December of 2010 there were 5,36 mln buildings and 13,43 mln apartments.

Table 1. Age structure of housing resources in Poland (data come from the Population Census of the Central Statistical Office) and the demand of energy.¹

Lp.	Time of construction of the building	Buildings		Apartments		Primary energy	Final energy
		thousands	%	mln	%	kWh/(m ² a)	kWh/(m ² a)
1	before 1918	413,30	7,71	1,21	9,01	> 350	> 300
2	1918 – 1944	828,20	15,44	1,54	11,46	300 – 350	260 – 300
3	1945 – 1970	1367,50	25,50	3,71	27,62	250 – 300	220 – 260
4	1971 – 1978	676,50	12,61	2,16	16,08	210 – 250	190 – 220
5	1979 – 1988	763,50	14,24	2,20	16,38	160 – 210	140 – 190
6	1989 – 2002	698,40	13,02	1,52	11,31	140 – 180	125 – 160
7	2003 – 2010	616,02	11,48	1,09	8,14	100 – 150	90 – 120
8	All until December 2010	5363,42	100,0	13,43	100,0	-----	-----

Attention: The primary energy indicator concerns the index of nonrenewable primary energy in the purpose of heating, ventilation and domestic hot water; The final energy indicator concerns the final energy of the demand on the heating and ventilation and domestic hot water.

Most Polish buildings, particularly multi-family residential buildings, received permissions to use decades ago, and thus at a time when energy prices were low and did not reflect its economic value. The technology that were used, did not include duly thermal insulation of buildings, and the appropriate internal temperature heating systems provide extensive collecting a relatively large amount of energy. Existing buildings, that were built before 1998 are characterized by the level of demand for non-renewable primary energy much higher than the buildings currently being build.

There are a lot of differences in the structure of buildings in Poland. The pre-war urban area is dominated by buildings - mostly brick buildings brick, having usually a few floors. Many of the buildings

¹ Edited by S. Mankowski, E. Szczechowiak, Strategic research project entitled "Integrated system for reducing operating energy consumption in buildings" Research Task No. 2 Volume I, Part A: Conditions of transformations in construction, p.66.

of this type is still in poor condition and require major repairs. The method of heating and hot water preparation is varied. Still widely used as the main heat source is coal boiler. Common are also flow water heaters. Some apartments equipped with central heating boiler powered by gas or solid fuel.

The years 1946 – 1990 were intense in erecting buildings, and in the mid-60s the twentieth century began with the rapid development of large panel technology. Most are high or four - stories buildings, often requiring modernization today with a special focus within the improvement of thermal insulation of bulkheads, as well as the replacement of the central heating. Most buildings are supplied with heat from district heating network.

New buildings

There is no official register of the buildings that are constructed. However this number can be issued on the basis of data concerning the number of buildings that were given permission to use. In 2012 there were 97323 residential (single and multi), collective residential and public utility buildings. In 2013 that number diminished to 95815.²

Table 2. Number of buildings received a permission to use 2011-2013

	2011	2012	2013
Single-family buildings	75075	82648	82809
Multi-family buildings	2757	3478	3217
Collective residential buildings (e.g. hotels, detention center)	1054	918	746
Public utility buildings (e.g. hospitals, universities, public authority buildings, malls, banks etc)	10157	10243	8993
All	89043	97287	95765

The significant impact on the decrease of the use of energy on the heating in buildings have the changes made in the provisions concerning heat transfer coefficient of exterior walls and ceilings of buildings $U [W/m^2 \cdot K]$. These changes are presented in Table 3.

² Data from the The Main Authority Building Inspectorate (Główny Urząd Nadzoru Budowlanego) : ww.gunb.gov.pl – “Building movement in 2012”, “Building movement in 2013”.

Table 3. Changes of the heat transfer coefficient U [$W/m^2 \cdot K$] for the rooms in the multi-residential buildings, heated more than $16^\circ C$.³

Polish Norm	Year of coming into force	Exterior wall	Flat roof	Floor above unheated cellar	Floor above attic	Balcony windows and door
PN-57/B02405 ^{*)}	since 1958	$1,16 \div 1,42$	0,87	1,16	$1,04 \div 1,16^{3)}$	-
PN-64/B03404 ^{*)}	since 1968	1,16	0,87	1,16	$1,04 \div 1,16^{3)}$	-
PN-74/B03404 ^{**)}	since 1976	1,16	0,7	1,16	0,93	-
PN-82/B02020 ^{**)}	since 1983	0,75	0,45	1,16	0,40	$2,0 \div 2,6^{1)}$
PN-91/B02020 ^{**)}	Since 1992	$0,55 \div 0,70^{2)}$	0,3	0,60	0,30	$2,0 \div 2,6^{1)}$
Technical requirements – the ordinance ^{**)}	since 16 th of December 2002	$0,30 \div 0,65^{3)}$	0,25	0,60	0,30	$2,0 \div 2,6^{1)}$
Technical requirements – the ordinance	since 1 st of January 2014	0,25	0,20	0,25	0,20	$1,3 \div 1,5^{4)}$
Technical requirements – the ordinance	since 1 st of January 2017	0,23	0,18	0,25	0,18	$1,1 \div 1,3^{4)}$
Technical requirements – the ordinance	since 1 st of January 2021	0,20	0,15	0,25	0,15	$0,9 \div 1,1^{4)}$

^{*)} $\theta_i = 18^\circ C$, ^{**)} $\theta_i = 20^\circ C$, ¹⁾ depends on the climate, ²⁾ depends on the genre of the wall (with the window opening and doorway or not), ³⁾ depends on the genre and the structure of the wall.

³ Strategic research project entitled "Integrated system for reducing operating energy consumption in buildings" Research Task No. 5: Optimising energy consumption in buildings, A Guide for Students: The impact of automation on energy efficiency in buildings., p.19.
Institute of Technique and Construction, dr inż. Krzysztof Kasperkiewicz, *Energy consumption in the building sector-present and future*.

2 Application of the definition of nearly zero-energy buildings

Please indicate how a nearly zero-energy building is defined within national context and explain underlying assumptions and factors that provide the rationale for the chosen definition.

For reporting the detailed application in practice of the definition of nearly zero-energy buildings, the table presented in the Annex is to be used.

If a national definition of nearly zero-energy buildings does not exist yet in your country, please indicate here whether precise plans are already under development and if so, please describe these plans. Please also describe if any currently used non-governmental definitions will be considered in these plans and/or a future directive.

The application of the definition on the nearly zero energy building

Actually it is used the definition stated in the art. 2 par. 2 of the directive of EPDB 2010/31/UE, according to which the nearly zero energy building is treated as a building of very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

The definition of the nearly zero energy building has been the subject of governmental works. The definition shall refer to the binding technical – buildings provisions, stipulated in the Ministry of Infrastructure ordinance of 12 April 2002 on the technical requirements that shall be met by the buildings and their location. The requirements on the energy consumption for buildings, provided in the abovementioned ordinance will be the quantitative basis of the definition of the nearly - zero energy building.

The level of the requirements shall differ in terms of the genre of the building taking into account the economical aspects and gradual increase of requirements. The detailed definition shall be indicated in the National plan for increasing the number of nearly zero-energy buildings, which now is in the preparation by the Ministry of Infrastructure and Development.

3 Intermediate targets for improving the energy performance of new buildings in order to ensure that by 31 December 2020 all new buildings are nearly zero-energy buildings

Please report the 2015 targets ensuring that by 31 December 2020 all new buildings are nearly zero-energy buildings. Also explain how they relate to and help to ensure that all new buildings are nearly zero-energy buildings by 31 December 2020.

What are the qualitative and quantitative 2015 targets for all new buildings?

As the intermediate target it should be treated the successive increase of the technical – building requirements related to the energy consumption, provided in the Ministry of Infrastructure ordinance of 12 April 2002 on the technical requirements that shall be met by the buildings and their location. The first amendment of the ordinance came into force in 1st of January 2014 and provided arising the requirements through next years: 2017 and 2021 or 2019 – in case of the buildings occupied by a public authority and frequently visited by the public. The requirements are related to the thermal insulation of external walls and the formation of a suitably low values of EP [kWh/m²/year]. These requirements have to be fulfilled in order to get a building permit by the building.

3.1.1 Qualitative 2015 targets: Interim energy related requirements for new residential and non-residential buildings

Requirements on fraction of renewable energies: The changes have been made in the scope of the building project provisions. On the 3rd of October 2013 the ordinance of the Ministry of Transport, Construction and Maritime Economy of the 25 April 2012 changing the ordinance on the detailed scope and form of the building project (Dz. U. pos. 462), came into force. This amendment add to the building project, new information, like the analyze of the possibilities of rational use of high energy efficiency alternative systems such as: decentralized energy supply systems based on renewable energy, cogeneration, heating or cooling, district or block, in particular, when it is based entirely or partially on renewable energy and heat pumps. Application of these systems shall be considered on the state of executing the building project, that is approved in the decision of building permit or the decision of building project approval.

Requirements on useful energy demand: Not provided. There are requirements provided for heat transfer coefficient “U”.

Requirements on primary energy demand: See table 4 (p. 9).

In accordance with the binding provisions all of the new buildings have to fulfill the requirements included in the ordinance of the Ministry of Infrastructure of 12 April 2002 on the technical requirements that shall be met by the buildings and their location in order to get a building permit. The revised ordinance, binding from the 1st of January 2014, establish gradual increase of the technical requirements connected with the heat protection and energy consumption in the new buildings.

The maximum indicator of the prime energy stated the annual demand calculation on the nonrenewable prime energy to heat, ventilation, cooling, domestic hot water and lightning shall be calculated in accordance with following model:

$$EP = EP_{H+W} + \Delta EP_C + \Delta EP_L; [kWh/(m^2 \cdot year)]$$

where:

EP_{H+W} - fragmentary maximum indicator of the prime energy on the demand of heating, ventilation, and domestic hot water,

ΔEP_C - fragmentary maximum indicator of the prime energy on the demand of cooling,
 ΔEP_L - fragmentary maximum indicator of the prime energy on the demand of lightening.

Table 4. Fragmentary maximum indicator of the prime energy on the demand of heating, ventilation and domestic hot water.

Lp.	The type of building	Fragmentary maximum indicator of the prime energy on the demand of heating, ventilation and domestic hot water [kWh/(m ² ·year)]		
		since 1 st of January 2014.	since 1 st of January 2017	since 1 st of January 2021 ^{*)}
1	Residential building:			
	a) single-family	120	95	70
	b) multi-family	105	85	65
2	Collective residence building:	95	85	75
3	Public building:			
	a) connected with health protection	390	290	190
	b) rest	65	60	45
4	Agricultural building, warehouse and production building.	110	90	70

^{*)} Since 1st of January 2019 – in the case of the buildings occupied by a public authority and frequently visited by the public.

The increase of prime energy indicator and easier fulfill of the requirements stated in the abovementioned ordinance, can be achieved by the application of the energy from renewable sources.

3.1.2 Quantitative 2015 targets: Share of nZEB according to official nZEB definition on all newly constructed buildings (define reference parameter e.g. number of buildings, floor area, volume etc.):

Miscellaneous:

From your point of view, how close is your country at the moment in achieving this target? In case there is no target defined yet, please indicate when it is expected to have such a target.

It wasn't lead any official register concerning the number of the nearly – zero energy buildings.

In compliance with the rules stated in table nr 4 (p. 9), the target establishing nearly – zero energy level in buildings shall be indicated in 2021 or in 2019, in case of the buildings occupied by a public authority and frequently visited by the public.

According to the data passed from The Main Authority Building Inspectorate⁴ (Główny Urząd Nadzoru Budowlanego) each year (from 2011-2013) there are issued around 84262 building permissions to use for the residential and collective residence buildings. Consequently from 2021, there shall be around 84262 residential and collective residence buildings that will be nearly zero energy use.

⁴ Data from the The Main Authority Building Inspectorate : www.gunb.gov.pl – “Building movement in 2011”, “Building movement in 2012”, “Building movement in 2013”.

4 Intermediate targets for improving the energy performance of new buildings in order to ensure that by 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings

Please report here the 2015 targets ensuring that by 31 December 2018 all new public buildings are nearly zero-energy buildings. Also explain how they relate to and help to achieve that by 31 December 2018, all new public buildings are nearly zero-energy buildings

What are the qualitative and quantitative 2015 targets for all new buildings occupied and owned by public authorities?

As it was mentioned in question 3, the intermediate aims shall be recognized as successive increasing of technical – construction requirements, connected with energy efficiency in buildings, providing the needs of the heating isolation of the building envelope as well as creating adequate parameter of the prime energy. The first amendment of the ordinance came into force in 1st of January 2014 and provide arising requirements through next years: 2017 and 2021 or 2019 – in case of the buildings occupied by a public authority and frequently visited by the public.

4.1.1 Qualitative 2015 targets: Interim energy related requirements for new public buildings

Requirements on fraction of renewable energies: The changes have been made in the scope of the building project provisions. On the 3rd of October 2013 the ordinance of the Ministry of Transport, Construction and Maritime Economy of the 25 April 2012 changing the ordinance on the detailed scope and form of the building project (Dz. U. pos. 462), came into force. This amendment add to the building project, new information, like the analyze of the possibilities of rational use of high energy efficiency alternative systems such as: decentralized energy supply systems based on renewable energy, cogeneration, heating or cooling, district or block, in particular, when it is based entirely or partially on renewable energy and heat pumps. Application of these systems shall be considered on the state of executing the building project, that is approved in the decision of building permit or the decision of building project approval.

Requirements on useful energy demand: Not provided. There are requirements provided for heat transfer coefficient “U”.

Requirements on primary energy demand: See table 4 (p. 9).

Each of these requirements has to be fulfilled in order to get a building permission.

4.1.2 Quantitative 2015 targets: Share of public nZEB according to official nZEB definition on all newly constructed public buildings (define reference parameter e.g. number of buildings, floor area, volume etc.):

Miscellaneous

From your point of view, how close is your country at the moment in achieving this target? In case there is no target defined yet, please indicate when it is expected to have such a target.

In compliance with the rules stated in table 4, the target establishing nearly – zero energy level in buildings shall be indicated in 2019, in case of the buildings occupied by a public authority and frequently visited by the public.

According to the data passed from The Main Authority Building Inspectorate⁵ (Główny Urząd Nadzoru Budowlanego) each year (from 2011 to 2013) there are issued around 9797 building permits to use for the utility public buildings. It is estimated that 10 % of it, are occupied by public authorities, frequently visited by public. Consequently since 2020 each year there shall be around 979 public utility buildings that will be nearly zero energy use.

⁵ Data from the The Main Authority Building Inspectorate : www.gunb.gov.pl – “Building movement in 2011”, “Building movement in 2012”, “Building movement in 2013”.

5 Policies and measures for the promotion of all new buildings being nearly zero-energy buildings after 31 December 2020

Above all measures and policies on the first position it should be placed the Ministry of Infrastructure ordinance from 12 of April 2002 on the technical conditions that shall be met by the buildings and their location. The impact of these provisions shall be the most stimulating and effective in order to reach nearly – zero building priorities.

Increasing the technical requirements in the building provisions

The issues connected with the energy saving and heating isolation, in relation to the designed, new and renovated buildings or in the event of changing the method of use of the building, are provided in the X division of the Ministry of Infrastructure ordinance from 12 of April 2002 on the technical conditions that shall be met by the buildings and their location.

Changing of the technical – building provisions was made in the amendment of abovementioned ordinance, that come into force the 1st of January 2014. The requirements that were increased are related to the equipment of the building, the index influenced on its energy efficiency and the equality of heat protection. The abovementioned requirements, as so far will be applicable in the event of design, building, renovation of the buildings and changing their method of use.

In accordance with the amendment of the technical – building provisions the building and its heating, climatisation and ventilation systems or hot water as well as internal lightening but only in relation to the public utility buildings, collective residence, industry, agricultural and storage buildings, shall be designed and build guaranteeing fulfillment followed requirements:

- guarantee that the value of the indicator prime energy [kWh/(m²year)], describing annual demand for non-renewable primary energy, calculated in accordance with the ordinance on the methodology of calculating the energy performance of building, is less than stipulated in the ordinance on the technical conditions that shall be met by the buildings and their location.
- the partitions and technical equipment of the building as well as the window area shall comply with the requirements on the thermal insulation stipulated in the Annex nr 2 to the abovementioned ordinance.

The text of Annex nr 2 content the gradual increase of the requirements connected with i.e. insulation of external walls until 2021. The changes are going to be made in 2017 and in 2021 with respect to the buildings occupied by authorities, that second gradation of the requirements will come into force earlier - in 2019. This kind of gradual increase of the requirements let the participants of the building market get used to changes.

On the basis of the provisions of the building law from the 7th July 1994 - (Dz. U. z 2013, pos. 1409, .), there is energy evaluation system of the buildings. It includes the duties related to displaying and handed over the energy performance certificates of the buildings in specified situations and conducting the inspections of heating and air – conditioning systems in the buildings. Since 1 of July 2012, there were added two more definitions: renewable source of energy and useful heat from cogeneration.

Irrespectively of the above, the changes have been made in the scope of the building project provisions. On the 3rd of October 2013 the ordinance of the Ministry of Transport, Construction and Maritime Economy of the 25 April 2012 changing the ordinance on the detailed scope and form of the building project (Dz. U. pos. 462), came into force. This amendment add to the building project, new information, like the analyze of the possibilities of rational use of high energy efficiency alternative systems such as: decentralized energy supply systems based on renewable energy, cogeneration,

heating or cooling, district or block, in particular, when it is based entirely or partially on renewable energy and heat pumps. Application of these systems shall be considered on the state of executing the building project, that is approved in the decision of building permit or the decision of building project approval.

The abovementioned provisions have in purpose to spread the usage of the alternative solutions everywhere where there is economical, technical and ecological reason. Until today this analyze was executed only for the buildings which surface were more than 1000 m². The analyze can be made for all of the buildings situated on the same area, with the same destination and similar technical – usage factors.

There will be also changed the ordinance on the methodology of calculating the energy characteristic in the buildings and the sample of energy performance certificate. Greater meaning will be attached to the information about the cost-optimal or cost-effective improvement of the energy performance of a building or building unit. The expert authorized to execute the energy performance certificate will be obliged to inform about the possible measures that can be made to improve energy efficiency. That piece of knowledge can be very useful for the owner and for the inhabitant of the building in the scope of making effective financial and energy renovation.

Apart from the legislative measures, there are financial support measures, that come from The National Fund of Environmental Protection and Water Management (NFEP&WM).⁶

The National Fund of Environmental Protection and Water Management (NFEP&WM) is a source of financing numerous activities that improve energy efficiency, also in a scope of building sector.

Priority programs conducted by NFEP&WM

Program	Destination	Financing	Beneficiaries
Improvement of energy efficiency LEMUR – energy efficient public utility buildings	Avoidance of CO ₂ emissions in relation to the design and construction of energy-efficient public buildings	Grants Loans Continuous call for proposals until 31.12.2014	Sector entities fin. public (without state budgetary units), local government units and their associations, NGOs, churches and religious associations, other entities
Improving energy efficiency. Subsidies for loans to build energy-efficient homes	Save energy and reduce or avoid CO ₂ emissions by funding projects that improve energy efficiency in newly constructed residential buildings	Grant for partial repayment of a bank loan. Loans with a grant offered by selected banks.	Individuals
Payments to loans	Reduce or avoid CO ₂	Grant for partial	Individuals, residential

⁶ Data from National Fund of Environmental Protection and Water Management, <http://www.nfosigw.gov.pl/srodki-krajowe/>

Program	Destination	Financing	Beneficiaries
for solar panels	emissions by increasing the production of heat from renewable sources	repayment of a bank loan Loans with a grant offered by selected banks.	communities

5.1 Residential buildings

5.1.1 Relevant regulations

- The building law from the 7th of July 1994;
- The ordinance of the Ministry of Infrastructure from 12th of April 2002 on the technical requirements that shall be met by the buildings and their location;
- The ordinance of the Ministry of Infrastructure of 6th November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates;
- The ordinance of the Ministry of Transport, Construction and Maritime Economy of 25th April 2012 amending the ordinance on the detailed scope and form of the building project.

5.1.2 Relevant economic incentives and financing instruments

The National Fund of Environmental Protection and Water Management (NFEP&WM) is the source of financing the numerous initiatives aimed at the improvement of the energy efficiency in the building area. One of conducted activities are the grants to the loans on the construction of the energy efficiency buildings. The purpose of the program is to economize until 93 500 MWh per year, what will decrease also the emissions of the CO₂ of about 32 300 Mg per year. The program also concerns single – residence and the dwellings of high energy efficiency.

5.1.3 Energy performance certificates' use and layout in relation to nZEB standard

The templates of the energy performances are provided in the ordinance of the Ministry of Infrastructure of the 6th of November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. The nzeb standard will be used in the frame of those templates, there won't be any other layouts.

5.1.4 Supervision (energy advice and audits)

There will be changed the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. There will be more importance attached to the information concerning recommendations for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit. The expert authorized to execute the energy performance certificate will be obliged to inform about the possible measures that can be made to improve energy efficiency. That piece of knowledge can be very useful for the owner and for the inhabitant of the building in the scope of making effective financial and energy renovation.

5.1.5 Information (tools)

Information that are on the Ministry of Infrastructure and Development website.

5.1.6 Demonstration

5.1.7 Education and training

National Research and Development Centre has conducted the research project entitled *Integrated system for reducing operating energy consumption of buildings*, that aim was to the development of technical and organizational solutions for the design, building and exploitation of residential and public buildings, which lead to reduce their energy consumption and increasing the use of

renewable energy sources in the energy balance of the building. The realization of seven research tasks within this project has started in 2010.

The matters realized within abovementioned projects are as followed:

- The analysis of the possibilities and the social and economic effects of the energy efficiency increase in buildings;
- The developing optimal energy solutions typical structural-materials and installation of buildings;
- Increase of energy consumption from renewable sources in the buildings;
- Development of thermal diagnostics of buildings;
- Optimizing energy consumption in buildings;
- Analysis of technical and operational requirements for buildings in the power of centralized heat sources;
- The conditions and opportunities to save energy by using instruments of urban policy.

Furthermore it should be also noticed that The National Fund of Environmental Protection and Water Management (NFEP&WM) realized the informative campaigns concerning the renewable energy sources, in the frame of the program entitled „Ecological education“. In 2011 NFEP&WM conducted 20, and in 2012 - 23 educative campaigns, in the frame of mentioned subject.

5.2 Non-residential buildings

5.2.1 Relevant regulations

- The building law from the 7th of July 1994;
- The ordinance of the Ministry of Infrastructure from 12th of April 2002 on the technical requirements that shall be met by the buildings and their location;
- The ordinance of the Ministry of Infrastructure of 6th November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates;
- The ordinance of the Ministry of Transport, Construction and Maritime Economy of 25th April 2012 amending the ordinance on the detailed scope and form of the building project.

5.2.2 Relevant economic incentives and financing instruments

See information in 5.1.2.

5.2.3 Energy performance certificates' use and layout in relation to nZEB standard

See information in 5.1.3.

5.2.4 Supervision (energy advice and audits)

5.2.5 Information (tools)

See information in 5.1.5.

5.2.6 Demonstration

5.2.7 Education and training

See information in 5.1.7.

5.3 From your point of view, how would you evaluate the current measures that are in force? Please also try to describe the existing gap between what is in force and what should be in force in order to ensure that after 31 December 2020, all new buildings are nearly zero-energy buildings. Are there precise measures planned for the future?

Above all presented measures and policies, the Ministry of Infrastructure ordinance from 12 of April

2002 on the technical conditions that shall be met by the buildings and their location shall have the most important impact in creating the most numerous stock of nearly zero energy buildings. Next to these provisions, the financial programs conducted by mentioned bodies shall be the most stimulating and effective. There are no measures yet predicted after 2020.

6 Policies and measures for the promotion of all new buildings occupied and owned by public authorities being nearly zero-energy buildings after 31 December 2018

6.1 All new buildings occupied and owned by public authorities

6.1.1 Relevant regulations

- The building law from the 7th of July 1994;
- The ordinance of the Ministry of Infrastructure from 12th of April 2002 on the technical requirements that shall be met by the buildings and their location;
- The ordinance of the Ministry of Infrastructure of 6th November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates;
- The ordinance of the Ministry of Transport, Construction and Maritime Economy of 25th April 2012 amending the ordinance on the detailed scope and form of the building project.

6.1.2 Relevant economic incentives and financing instruments

The National Fund of Environmental Protection and Water Management (NFEP&WM) is the source of financing the numerous initiatives aimed at the improvement of the energy efficiency in the building area. One of conducted activities are the grants to the loans on the construction of the energy efficiency buildings. The purpose of the program is to economize until 93 500 MWh per year, what will decrease also the emissions of the CO₂ of about 32 300 Mg per year. The program also concerns single – residence and the dwellings of high energy efficiency.

6.1.3 Energy performance certificates' use and layout in relation to nZEB standard

The templates of the energy performances are provided in the ordinance of the Ministry of Infrastructure of the 6th of November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. The nZEB standard will be used in the frame of those templates, there won't be any other layouts.

6.1.4 Supervision (energy advice and audits)

There will be changed the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. There will be more importance attached to the information concerning recommendations for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit. The expert authorized to execute the energy performance certificate will be obliged to inform about the possible measures that can be made to improve energy efficiency. That piece of knowledge can be very useful for the owner and for the inhabitant of the building in the scope of making effective financial and energy renovation.

6.1.5 Information (tools)

Information that are on the Ministry of Infrastructure and Development website.

6.1.6 Demonstration

6.1.7 Education and training

National Research and Development Centre has conducted the research project entitled *Integrated*

system for reducing operating energy consumption of buildings, that aim was to the development of technical and organizational solutions for the design, building and exploitation of residential and public buildings, which lead to reduce their energy consumption and increasing the use of renewable energy sources in the energy balance of the building. The realization of seven research tasks within this project has started in 2010.

The matters realized within abovementioned projects are as followed:

- The analysis of the possibilities and the social and economic effects of the energy efficiency increase in buildings;
- The developing optimal energy solutions typical structural-materials and installation of buildings;
- Increase of energy consumption from renewable sources in the buildings;
- Development of thermal diagnostics of buildings;
- Optimising energy consumption in buildings;
- Analysis of technical and operational requirements for buildings in the power of centralized heat sources;
- The conditions and opportunities to save energy by using instruments of urban policy.

Furthermore it should be also noticed that The National Fund of Environmental Protection and Water Management (NFEP&WM) realized the informative campaigns concerning the renewable energy sources, in the frame of the program entitled „Ecological education“. In 2011 NFEP&WM conducted 20, and in 2012 - 23 educative campaigns, in the frame of mentioned subject.

6.2 From your point of view, how would you evaluate the current measures that are in force? Please also describe the existing gap between what is in force and what should be in force in order to ensure that after 31 December 2018, all new public buildings are nearly zero-energy buildings. Are there precise measures planned for the future?

Above all presented measures and policies, the Ministry of Infrastructure ordinance from 12 of April 2002 on the technical conditions that shall be meet by the buildings and their location shall have the most important impact in creating the most numerous stock of nearly zero energy buildings. Next to these provisions, the financial programs conducted by mentioned bodies shall be the most stimulation and effective. There are no measures yet predicted after 2020.

7 Policies and measures for the promotion of existing buildings undergoing major renovation being transformed to nearly zero-energy buildings

There are several measures promoting and stimulating the renovation of existing buildings. First of all, above legislative actions, it should be stated that the ordinance on the technical requirements that shall be met by the buildings and their location that provides new requirements within the energy efficiency buildings, it's applicable not only when the buildings are constructed, but also in case where there are subjected to major renovation. That means that all of requirements provided in the ordinance will be applicable to the part of building, being renovated.

What can be treated as major renovation, according to binding rules of the building law:

- a) redevelopment – on the basis of building law – it's execution of works, which resulted in change in performance or technical parameters of the existing building structure, with the exception of the characteristic parameters, such as: volume, building area, height, length, width or number of floors;
- b) repair – on the basis of the building law - the exercise of an existing building construction works consisting of restoring the original condition, and not constituting ongoing maintenance, and the permitted use of construction products other than those used in the original state;
- c) thermomodernisation of the buildings which height is minimum 12 m;
- d) building subjected to extension, superstructure, reconstruction.

Apart from the legislative measures, there are financial support measures, that come from different following sources:

- a) The National Fund of Environmental Protection and Water Management (NFEP&WM) - national subsidies and loans,
- b) Thermo – modernization Fund – national loans,
- c) The operational Program Infrastructure and the Environment in 2014- 2020 - in the frame of Union European subsidies.

Ad. a) The National Fund of Environmental Protection and Water Management (NFEP&WM) is a source of financing numerous activities that improve energy efficiency, also in a scope of building sector.

Priority programs conducted by NFEP&WM

1) Saving energy and promoting renewable energy sources	Reducing greenhouse gas emissions and air pollution, and increasing the share of energy from renewable sources by the modernization or replacement of existing heat sources, including modernization of the combustion process or using another energy media	The grant of 600 thousand. to 5 million EUR. Call for proposals from 03.02.2014 to 07.04.2014, the PL04 Operational Program, funding from the Norwegian	Small, medium and large enterprises
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		and EEA.	
2) Improving air quality. KAWKA - Liquidation of low emission	Reducing air pollution in areas where there are significant concentrations exceeding the permissible levels and for which they were developed air protection programs.	The release of funds for grants The planned recruitment of February / March 2014	Provincial Funds for Environmental Protection and Water Management
3) Improving energy efficiency. Energy-saving investments in small and medium-sized enterprises	Reducing energy consumption as a result of investments in energy efficiency and use of renewable energy in the SME sector. As a result, the program will reduce CO ₂ emissions.	Grants for SMEs to 60 million PLN	Small and medium-sized enterprises
4) Support for distributed, renewable energy sources. BOCIAN-distributed, renewable energy	Reduce or avoid CO ₂ emissions by increasing energy production from plants using renewable energy sources.	Loan	Businesses within the meaning of Art. 43 (1) of the Civil Code undertaking the implementation of projects in the field of renewable energy sources in the Polish Republic.
5) Support for distributed, renewable energy sources. Prosumer - line financing for the purchase and installation of renewable energy micro-installations	Reduce or avoid CO ₂ emissions by increasing energy production from renewable sources, through the purchase and installation of a small or micro-installations of renewable energy sources to produce heat or electricity	The release of funds to banks for the purpose of loans and grants	Individuals, community housing, housing cooperatives. Information about the vacancy posted on the National Fund.
6) GIS. Energy management in buildings selected public finance sector entities	Retrofitting of buildings, replacement of HVAC systems, the use of renewable energy, the exchange of indoor lighting	Grant	Polish Academy of Sciences and research institutes, national cultural institutions, institutions economy, budget, city and district

			fire brigade command. Information about the vacancy posted on the National Fund.
7) GIS. Energy management in public buildings	Retrofitting of public buildings	Grant, loan	Public entities listed in the program. Call for proposals until 31 January 2014
8) Saving energy and promoting renewable energy sources	Reducing greenhouse gas emissions and air pollution, and increasing the proportion of energy derived from renewable sources in the overall energy balance	grant The planned recruitment of the first quarter of 2014, PL04 Operational Program, funding from the Norwegian and EEA.	Enterprises
9) Saving energy and promoting renewable energy sources	Reducing greenhouse gas emissions and air pollution, and increasing the share of energy from renewable sources by the modernization or replacement of existing heat sources, including modernization of the combustion process or using another energy media	The grant of 600 thousand. to 5 million EUR. Call for proposals from 03.02.2014 to 07.04.2014 PL04 Operational Program, funding from the Norwegian and EEA.	Small, medium and large – sized enterprises

b) Thermo-modernization Fund ⁷

The rules of financing, in the frame of Thermo – modernization Fund are stipulated in the law of 21 November 2008 on the support of thermomodernization and the repairs (Dz. U. pos. 223, Nr 1459).

⁷ Information from Bank Gospodarstwa Krajowego: www.bgk.com.pl

The part of cost, provided in the abovementioned act, concerns the thermomodernization and repair actions that the basic aim is the financial help for the investor, who realizes the thermomodernization, repair actions as well as the repairs of the buildings single – residence with the participation of the taken loans in the commercial banks. The support is called respectively: „thermomorenization premium“, „repair premium“ and „compensation premium“ and is a source of repay part of the loan taken for the project or renovation.

The economies in the energy consumption, resulted from the thermomodernisation premium:

- decrease reduction in annual demand for energy supplied to the heating and domestic hot water and heating at least:
 - **10%** in the buildings that are renovated only heating system;
 - **15%** in the buildings that, after 1984 the modernization of heating system was conducted;
 - **25%** in the rest of the buildings.
- decrease reduction in annual demand for energy supplied at least of 25 %
- decrease in annual costs of gaining heat at least of 20 %.

c) Energy efficiency support in building sector in the frame of the operational Program Infrastructure and the Environment in 2014- 2020⁸

Operational Program Infrastructure and the Environment (POIE) has been drawn in the purpose of determine the principles of the European funds (European Regional Development Fund and the Cohesion Fund) in the following sectors: environment, transport, energy, culture, health care, higher education.

In a frame of I priority axis, the thematic objective 4 Supporting the towards a low carbon economy in all sectors the priority investment 4.3 Supporting energy efficiency, intelligent management of energy and use of the renewable sources of energy in the public infrastructure, including public building and housing sector.

There is predicted a support of complex energy modernization of the public utility buildings and residence as well as the exchange of the equipment of these buildings on the energy efficient ones in the scope connected with i.e.:

- heating of the building, changing the windows, front door and the lightening, on the energy efficient ones;
- the renovation of the heating systems (including exchange and connection of the heat source), ventilation system and climatisation, using the automatic weather and building management system;
- building and modernization of internal installation receiver and the decommissioning of existing sources of heat;
- the installation of the microgeneration or micro – trigeneration for own needs,
- the installation of the renewable energy sources in the energy renovated buildings;
- the installation of the climatisation systems, including also energy renewable sources.

⁸ Information from: www.pois.gov.pl

7.1 Residential buildings

7.1.1 Relevant regulations

- The building law from the 7th of July 1994,
- The ordinance of the Ministry of Infrastructure from 12th of April 2002 on the technical requirements that shall be met by the buildings and their location,
- The ordinance of the Ministry of Infrastructure of 6th November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates,
- The ordinance of the Ministry of Transport, Construction and Maritime Economy of 25th April 2012 amending the ordinance on the detailed scope and form of the building project.

7.1.2 Relevant economic incentives and financing instruments

The National Fund of Environmental Protection and Water Management (NFEP&WM) is the source of financing the numerous initiatives aimed at the improvement of the energy efficiency in the building area. One of conducted activates are the grants to the loans on the construction of the energy efficiency buildings. The purpose of the program is to economize until 93 500 MWh per year, what will decrease also the emissions of the CO₂ of about 32 300 Mg per year. The program also concerns single – residence and the dwellings of high energy efficiency.

Operational program of Infrastructure and Environment was executed in the purpose of establish the rules of operating the European funds (European Regional Development Fund and the Cohesion Fund) in the following areas: environment, transport, energetic, culture, health protection, higher education. In the frame of I Aix, aim 4 Supporting the transition to a low carbon economy in all sectors there is important invest priority 4.3: *Promoting energy efficiency, intelligent power management and use of renewable energy sources in public infrastructure, including public buildings and the residential sector.*

There is also Thermo – modernization Fund that crucial aim is the financial help to the investor, that realizes projects connected with thermomodernisation or renovation as well as the renovation of the single - residence buildings with participation of the loans from commercial banks.

7.1.3 Energy performance certificates' use and layout in relation to nZEB standard

The templates of the energy performances are provided in the ordinance of the Ministry of Infrastructure of the 6th of November 2008 on the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. The nzeb standard will be used in the frame of those templates, there won't be any other layouts.

7.1.4 Supervision (energy advice and audits)

There will be changed the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. There will be more importance attached to the information concerning recommendations for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit. The expert authorized to execute the energy performance certificate will be obliged to inform about the possible measures that can be made to improve energy efficiency. That piece of knowledge can be very useful for the owner and for the inhabitant of the building in the scope of making effective financial and energy renovation.

7.1.5 Information (tools)

Information that are on the Ministry of Infrastructure and Development website.

7.1.6 Demonstration

7.1.7 Education and training

National Research and Development Centre has conducted the research project entitled *Integrated system for reducing operating energy consumption of buildings*, that aim was to the development of technical and organizational solutions for the design, building and exploitation of residential and public buildings, which lead to reduce their energy consumption and increasing the use of renewable energy sources in the energy balance of the building. The realization of seven research tasks within this project has started in 2010.

The matters realized within abovementioned projects are as followed:

- The analysis of the possibilities and the social and economic effects of the energy efficiency increase in buildings;
- The developing optimal energy solutions typical structural-materials and installation of buildings;
- Increase of energy consumption from renewable sources in the buildings;
- Development of thermal diagnostics of buildings;
- Optimising energy consumption in buildings;
- Analysis of technical and operational requirements for buildings in the power of centralized heat sources;
- The conditions and opportunities to save energy by using instruments of urban policy.

Furthermore it should be also noticed that The National Fund of Environmental Protection and Water Management (NFEP&WM) realized the informative campaigns concerning the renewable energy sources, in the frame of the program entitled „Ecological education“. In 2011 NFEP&WM conducted 20, and in 2012 - 23 educative campaigns, in the frame of mentioned subject.

7.2 Non-residential buildings

7.2.1 Relevant regulations

See information in 7.1.1

7.2.2 Relevant economic incentives and financing instruments

The National Fund of Environmental Protection and Water Management (NFEP&WM) is the source of financing the numerous initiatives aimed at the improvement of the energy efficiency in the building area. One of conducted activities are the grants to the loans on the construction of the energy efficiency buildings. The purpose of the program is to economize until 93 500 MWh per year, what will decrease also the emissions of the CO₂ of about 32 300 Mg per year. The program also concerns single – residence and the dwellings of high energy efficiency.

Operational program of Infrastructure and Environment was executed in the purpose of establish the rules of operating the European funds (European Regional Development Fund and the Cohesion Fund) in the following areas: environment, transport, energetic, culture, health protection, higher education. In the frame of I Aix, aim 4 Supporting the transition to a low carbon economy in all sectors there is important invest priority 4.3: *Promoting energy efficiency, intelligent power management and use of renewable energy sources in public infrastructure, including public buildings and the residential sector.*

7.2.3 Energy performance certificates' use and layout in relation to nZEB standard

See information in 7.1.3
<p>7.2.4 Supervision (energy advice and audits)</p> <p>There will be changed the methodology for calculating the energy performance of buildings and their parts and the methods of its executing and their templates. There will be more importance attached to the information concerning recommendations for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit. The expert authorized to execute the energy performance certificate will be obliged to inform about the possible measures that can be made to improve energy efficiency. That piece of knowledge can be very useful for the owner and for the inhabitant of the building in the scope of making effective financial and energy renovation.</p>
<p>7.2.5 Information (tools)</p> <p>See information in 7.1.5</p>
7.2.6 Demonstration
<p>7.2.7 Education and training</p> <p>See information in 7.1.7.</p>
<p>7.3 From your point of view, how would you evaluate the current measures that are in force? Please also try to describe the existing gap between what is in force and what should be in force in order to stimulate the transformation of buildings that are refurbished into nZEB. Are there precise measures planned for the future?</p>
<p>Above all presented measures and policies, the Ministry of Infrastructure ordinance from 12 of April 2002 on the technical conditions that shall be meet by the buildings and their location shall have the most important impact in creating the most numerous stock of nearly zero energy buildings. Next to these provisions, the financial programs conducted by mentioned bodies shall be the most stimulating and effective. There are no measures yet predicted after 2020.</p>

8 Additional Information

Please fill in any additional information on actions taken to increase the number of nearly zero-energy buildings in your country.

9 Possible improvements

Where do you see most room for improvement in order to increase the number of nearly zero-energy buildings in your country? Please also try to give examples for appropriate measures.

The most significant impact on the increase of the nearly-zero energy building shall be the result of the financial incentives. All the programs presented above have in purpose to stimulate energy efficiency in buildings. The UE subsidies provided in the frame of the Partnership Agreement - Programming of the financial perspective 2014 – 2020, with the national subsidies shall be the most important in stimulating use of energy efficiency solutions.