

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



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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)

The plan aimed at increasing the number of nearly zero-energy buildings in Lithuania has been drafted in line with the provisions of Article 9 of Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

The main purpose of the plan is to describe the national actions of Lithuania aimed at increasing the number of nearly zero-energy buildings. The action plan reviews the practical application of the definition of nearly zero-energy buildings, describes the newly adopted and planned measures for increasing energy efficiency, interim objectives for improving the energy performance of buildings in order to implement the objectives of the Directive, so that all new buildings are nearly zero-energy buildings by no later than 31 December 2020 and that after 31 December 2018 public authorities occupying and managing new buildings ensure that those buildings are nearly zero-energy buildings

In order to properly implement the requirements of Article 9(1) of the Directive [...] Lithuania has set transitional requirements for newly constructed buildings in 2014, 2016, 2018 and 2021 under building energy performance classes:

- **prior to 2014** – new buildings or their parts shall comply with the requirements for class C buildings;
- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.
- Law on Construction provides that after 31 December 2018, new state and local authorities, institutions and companies built buildings must be nearly zero-energy buildings

In view of the established requirements, in order for the building to fall within energy performance class B, its consumption of non-renewable energy for heating, cooling and lighting must be 1 or 2 times lower than that of class C buildings: for class A buildings, the costs shall be from 2 to 2,67 times lower; for A+ class buildings, the costs shall be from 2,67 to 4 times lower; for class A++ buildings, the costs shall be more than 4 times lower.

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.

The Law of the Republic of Lithuania on Renewable Energy (Official Gazette, 2011, No 62-2936) contains an initial definition of the concept of a nearly zero-energy building.

Nearly zero-energy building means a building that has a very high energy performance established in accordance with the normative technical construction documents. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable resources, including energy from renewable sources produced on-site or nearby.

The Construction Technical Regulation STR 2.01.09:2012 '*Energy Performance of Buildings. Certification of Energy Performance*' provides for the following details:

nearly zero-energy buildings are those that comply with the requirements of this Construction Technical Regulation for buildings of class A++ energy performance, i.e. buildings of very high energy performance with nearly zero-energy or very low energy consumption; most of the energy consumed is renewable energy, including renewable energy produced locally or nearby.

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?

In order to properly implement the requirements of Article 9(1) of the Directive Lithuania has set transitional requirements for newly constructed buildings in 2014, 2016, 2018 and 2021 under building energy performance classes:

- **prior to 2014** – new buildings or their parts shall comply with the requirements for class C buildings;
- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.

Compliance with the energy efficiency requirements is verified through the issuance of construction permits.

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

In order to properly implement the requirements of Article 9(1) of the Directive [...] Lithuania has set transitional requirements for newly constructed buildings in 2014, 2016, 2018 and 2021 under building energy performance classes (see Chapter **Error! Reference source not found.**) from 2014 – new buildings or their parts shall comply with the requirements for class B buildings

Requirements on fraction of renewable energies:

- The Government or institutions empowered by it shall prepare and implement measures increasing the use of renewable energy of all types in buildings and highly improving energy efficiency, related to general energy production and nearly zero-energy buildings.
- From 31 December 2014, new and existing buildings that are subject to major renovation shall comply with the requirements for the use of renewable energy resources. The compliance with such requirements may be ensured by using centrally supplied heat and cooling energy, where renewable energy resources are largely used for the production of such energy.
- From 1 January 2012 new and existing buildings belonging to state and municipal bodies and companies and requiring major renovation must comply with the requirements for the use of renewable energy resources.

Requirements on useful energy demand: It depends on the intended use of the building requirements are fixed and given in Construction Technical Regulation STR 2.05.01:2013 „Design of Energy Performance of Buildings“

Requirements on primary energy demand: It depends on the intended use of the building. Non-renewable and renewable primary energy factor values used in the calculations for different energy sources are fixed and given in Construction Technical Regulation STR 2.01.09:2012.

Example 1:

Based on the provisions of the Regulation, after evaluating a typical 1-2 apartment residential building of 150 m², its non-renewable primary energy costs for heating, cooling and lighting are as follows:

- for class C – 192 kWh/m² of heated area of the building per year;
- for class A – 91 kWh/m² of heated area of the building per year;
- for class A+ – 53 kWh/m² of heated area of the building per year;
- for class A++, where biofuel is used for heating and preparing hot water – 7 kWh/m² of heated area of the building per year, and energy from renewable resources forms the largest part of energy consumed in the building.

Non-renewable primary energy costs for preparing domestic hot water in such buildings are as follows:

- for class C – 45 kWh/m² of heated area of the building per year;
- for class A – 40 kWh/m² of heated area of the building per year;
- for class A+ – 35 kWh/m² of heated area of the building per year;
- for class A++ – 5 kWh/m² of heated area of the building per year.

In a 1-2 apartment class A residential building of 150 m² the consumption of non-renewable primary energy for heating, cooling and lighting is about 2.1 times lower than that for a class C building. Accordingly, in a class A+ building, the consumption of non-renewable primary energy is about 3.6 times lower, and in a class A++ building it is 27.6 times lower than that for a class C building.

In such a class A building, non-renewable primary energy consumption for preparing domestic hot water is 1.14 times lower, in a class A+ building – 1.31 times lower, in a class A++ building – 8.3 times lower than energy costs in a class C building.

Example 2:

According to the provisions of the Regulation, after evaluating a sufficiently typical 1-2 apartment residential building of 200 m², its non-renewable primary energy costs for heating, cooling and lighting are as follows:

- for class C – 183 kWh/m² of heated area of the building per year;
- for class A – 88 kWh/m² of heated area of the building per year;
- for class A+ – 50 kWh/m² of heated area of the building per year;
- for class A++, where biofuel is used for heating and preparing hot water – 7 kWh/m² of heated area of the building per year, and energy from renewable resources forms the largest part of energy consumed in that building.

Non-renewable primary energy costs for preparing domestic hot water in such 1-2 apartment building of 200 m² are as follows:

- for class C – 45 kWh/m² of heated area of the building per year;
- for class A – 40 kWh/m² of heated area of the building per year;
- for class A+ – 35 kWh/m² of heated area of the building per year;
- for class A++ – 5 kWh/m² of heated area of the building per year.

In a 1-2 apartment class A building of 200 m² the consumption of non-renewable primary energy for heating, cooling and lighting is about 2.1 times lower than that for a class C building. Accordingly, in a class A+ building, the consumption of energy is about 3.6 times lower, and in a class A++ building the consumption of non-renewable primary energy is 27 times lower than that for a class C building. Costs of non-renewable primary energy for preparing domestic hot water in a class A building are 1.14 times lower, in a class A+ building – 1.31 times lower, in a class A++ building – 8.3 times lower than those in a class C building.

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.):

Statistically, Lithuania every year issued $\pm 5,000$ permits for the construction of new buildings. Practice shows that with proper information, designers designs a higher energy performance of buildings than set in minimum requirements.

Lithuania has set transitional requirements for all newly constructed buildings in 2014, 2016, 2018 and 2021 under building energy performance classes:

- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.

Law on Construction provides that after 31 December 2018, new state and local authorities, institutions and companies built buildings must be nearly zero-energy buildings

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.

Year 2013 data, in Lithuania built and certified: more than 5700 buildings witch meet requirements of the energy efficiency class B; more than 20 buildings witch meet requirements of the energy efficiency class A and 1 witch meet requirements of the energy efficiency class A+. This shows that the legislation provides for the objectives to be achieved.

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?

In order to properly implement the requirements of Article 9(1) of the Directive Lithuania has set transitional requirements for newly constructed buildings in 2014, 2016, 2018 and 2021 under building energy performance classes:

- **prior to 2014** – new buildings or their parts shall comply with the requirements for class C buildings;
- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.
- Law on Construction provides that after 31 December 2018, new state and local authorities, institutions and companies built buildings must be nearly zero-energy buildings

Compliance with the energy efficiency requirements is verified through the issuance of construction permits.

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

Requirements on fraction of renewable energies:

- The Government or institutions empowered by it shall prepare and implement measures increasing the use of renewable energy of all types in buildings and highly improving energy efficiency, related to general energy production and nearly zero-energy buildings.
- From 31 December 2014, new and existing buildings that are subject to major renovation shall comply with the requirements for the use of renewable energy resources. The compliance with

such requirements may be ensured by using centrally supplied heat and cooling energy, where renewable energy resources are largely used for the production of such energy.

- From 1 January 2012 new and existing buildings belonging to state and municipal bodies and companies and requiring major renovation must comply with the requirements for the use of renewable energy resources.

Requirements on useful energy demand: It depends on the intended use of the building requirements are fixed and given in Construction Technical Regulation STR 2.05.01:2013 „Design of Energy Performance of Buildings“

Requirements on primary energy demand: It depends on the intended use of the building. Non-renewable and renewable primary energy factor values used in the calculations for different energy sources are fixed and given in Construction Technical Regulation STR 2.01.09:2012.

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.):

Statistically, Lithuania every year issued $\pm 5,000$ permits for the construction of new buildings. Practice shows that with proper information, designers designs a higher energy performance of buildings than set in minimum requirements.

Lithuania has set transitional requirements for all newly constructed buildings in 2014, 2016, 2018 and 2021 under building energy performance classes:

- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.

Law on Construction provides that after 31 December 2018, new state and local authorities, institutions and companies built buildings must be nearly zero-energy buildings.

Miscellaneous:

From 1 January 2012 new and existing buildings belonging to state and municipal bodies and companies and requiring major renovation must comply with the requirements for the use of renewable energy resources.

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.

Year 2013 data, in Lithuania built and certified: more than 5700 buildings witch meet requirements of the energy efficiency class B; more than 20 buildings witch meet requirements of the energy efficiency class A and 1 witch meet requirements of the energy efficiency class A+. This shows that the legislation provides for the objectives to be achieved.

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

5.1 Residential buildings

5.1.1 Relevant regulations

Law on Renewable Energy Resources

- The Government or institutions empowered by it shall prepare and implement measures increasing the use of renewable energy of all types in buildings and highly improving energy efficiency, related to general energy production and nearly zero-energy buildings.
- From 31 December 2014, new and existing buildings that are subject to major renovation shall comply with the requirements for the use of renewable energy resources. The compliance with such requirements may be ensured by using centrally supplied heat and cooling energy, where renewable energy resources are largely used for the production of such energy.
- The Government or an institution empowered by it shall establish the requirements of Articles 13(4), 6 and 7 of Directive 2009/28/EC and the procedure for monitoring their implementation.
- The Government or an institution empowered by it shall prepare and approve financial support schemes for supporting construction of nearly zero-energy buildings.
- Municipalities shall include measures for increasing the use of renewable energy resources in their action plans for the development of use of renewable energy resources.
- The Government or an institution empowered by it shall prepare and approve the programme for the use of roofs for energy production from solar heat energy and solar light energy.

Construction Technical Regulation STR 2.01.09:2012:

- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.

Law on Construction:

- after 31 December 2018, new state and local authorities, institutions and companies built buildings must be nearly zero-energy buildings.

Energy efficiency action plans I and II

The action plans review the existing situation in the field of energy consumption, evaluate energy saving potential, identify national energy saving targets, describe their calculation and strategy for attaining such targets.

The aim of the measure is to describe the measures completed (and still affecting energy saving) and ongoing from 1995 and to identify the measures to be taken in order to increase final energy efficiency and aimed at ensuring the attainment of national energy saving targets for 2008-2016.

The second energy efficiency action plan (hereinafter referred to as the 'Action Plan') has been prepared in accordance with the provisions of Article 14(2) of Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC (hereinafter referred to as 'Directive 2006/32/EC').

The main objective of the Action Plan is to describe the results of attainment of the national interim energy saving target for 2010. The Action Plan reviews the existing energy consumption, describes the newly approved and planned to approve energy efficiency improvement measures in order to increase final energy efficiency, and intended to ensure the attainment of the national energy saving target set for 2016.

The national energy saving target for a period of nine (2008-2016) years, identified in the first energy efficiency action plan, has been calculated in line with the requirements of Annex I to Directive 2006/32/EC, and amounts to 9%, compared to the final energy consumption average in 2001-2005. This amounts to 3797 GWh. Interim energy saving target for a three-year period (2008- 2010) amounts to 1.5% of final energy consumption average in 2001-2005 and is 628 GWh.

The final amount of energy saved in 2010 amounts to 780 GWh and complies with 1.8% final energy consumption average in 2001-2005 established under the scope of Directive 2006/32/EC. The saved amount has been calculated by using the bottom-up method, by evaluating the amount of energy saved by each measure increasing energy efficiency. The savings generated by some energy efficiency improvement measures described in the Action Plan are not provided, as it is impossible to quantify their impact.

Horizontal measures – 76% (590 GWh), services sector – 14% (110 GWh) and domestic sector – 10% (80 GWh) were the ones that most impacted the attainment of the 2010 indicator. After evaluating the impact of the completed, ongoing and planned individual energy saving measures, the final amount of energy foreseen to save in 2008-2016 amounts to 3962 GWh and complies with 9.4% of the final energy consumption average for 2001-2005, as set under the field of application of Directive 2006/32/EC. It is foreseen that horizontal measures will amount to 31% (1240 GWh), energy sector will amount to 19% (740 GWh), industry - about 14% (565 GWh), domestic holdings - about 14% (558 GWh), transport sector - 12% (472 GWh), and the services sector will amount to 9% (374 GWh) of the identified saving target for 2016.

5.1.2	Relevant economic incentives and financing instruments
5.1.3	<p>Energy performance certificates' use and layout in relation to nZEB standard</p> <ul style="list-style-type: none"> - Certification requirements for new buildings came into force on January 2007 - Existing and refurbished existing buildings from January 2009 - certificate provides information about opportunities to improve building energy efficiency - certificate provides links where is information about the energy efficiency improvement programs
5.1.4	Supervision (energy advice and audits)
5.1.5	<p>Information (tools):</p> <p>There is information about the energy efficiency of buildings through the media, news releases of the ministries and agencies.</p>
5.1.6	Demonstration
5.1.7	<p>Education and training</p> <p>There are special workshops and courses for building certification experts, designers and building owners</p>
5.2	Non-residential buildings
5.2.1	<p>Relevant regulations</p> <p>See in point number 5.1.1</p>
5.2.2	Relevant economic incentives and financing instruments
5.2.3	<p>Energy performance certificates' use and layout in relation to nZEB standard</p> <p>See in point number 5.1.3</p>
5.2.4	Supervision (energy advice and audits)
5.2.5	<p>Information (tools)</p> <p>See in point number 5.1.5</p>
5.2.6	Demonstration
5.2.7	<p>Education and training</p> <p>See in point number 5.1.7</p>
5.3	<p>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?</p> <p>Statistically, Lithuania every year issued $\pm 5,000$ permits for the construction of new buildings. Practice shows that with proper information, designers designs a higher energy performance of buildings than set in minimum requirements.</p> <p>Year 2013 data, in Lithuania built and certified: more than 5700 buildings witch meet requirements of the energy efficiency class B; more than 20 buildings witch meet requirements of the energy efficiency class A and 1 witch meet requirements of the energy efficiency class A+. This shows that the legislation provides for the objectives to be achieved.</p>

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

Law on Renewable Energy Resources

- The Government or institutions empowered by it shall prepare and implement measures increasing the use of renewable energy of all types in buildings and highly improving energy efficiency, related to general energy production and nearly zero-energy buildings.
- From 1 January 2012 new and existing buildings belonging to state and municipal bodies and companies and requiring major renovation must comply with the requirements for the use of renewable energy resources.

Construction Technical Regulation STR 2.01.09:2012:

- **from 2014** – new buildings or their parts shall comply with the requirements for class B buildings;
- **from 2016** – new buildings or their parts shall comply with the requirements for class A buildings;
- **from 2018** – new buildings or their parts shall comply with the requirements for class A+ buildings;
- **from 2021** – new buildings or their parts shall comply with the requirements for class A++ buildings.

Law on Construction:

- after 31 December 2018, new state and local authorities, institutions and companies built buildings must be nearly zero-energy buildings.

6.1.2 Relevant economic incentives and financing instruments

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

- Certification requirements for new buildings came into force on January 2007
- Existing and refurbished existing buildings from January 2009
- certificate provides information about opportunities to improve building energy efficiency
- certificate provides links where is information about the energy efficiency improvement programs

6.1.4 Supervision (energy advice and audits)

6.1.5 Information (tools)

There is information about the energy efficiency of buildings through the media, news releases of the ministries and agencies.

6.1.6 Demonstration

6.1.7 Education and training

There are special workshops and courses for building certification experts, designers and

building owners

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?

Statistically, Lithuania every year issued $\pm 5,000$ permits for the construction of new buildings. Practice shows that with proper information, designers designs a higher energy performance of buildings than set in minimum requirements.

Year 2013 data, in Lithuania built and certified: more than 5700 buildings witch meet requirements of the energy efficiency class B; more than 20 buildings witch meet requirements of the energy efficiency class A and 1 witch meet requirements of the energy efficiency class A+. This shows that the legislation provides for the objectives to be achieved.

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

7.1 Residential buildings

7.1.1 Relevant regulations

Law on Renewable Energy Resources

From 31 December 2014, new and existing buildings that are subject to major renovation shall comply with the requirements for the use of renewable energy resources. The compliance with such requirements may be ensured by using centrally supplied heat and cooling energy, where renewable energy resources are largely used for the production of such energy.

Under the Cohesion Promotion Action Programme (for 2007-2013)

1. The measure 'Renovation of multi-apartment buildings with the primary aim of increasing their energy efficiency' will help implement the objective of reducing the differences in the quality of the living environment in the capital and other cities of the country, by paying particular attention to improving housing conditions in problematic areas.

The aim of the measure is to renovate multi-apartment buildings, with the primary aim of increasing the qualities that determine their energy efficiency.

2. The 'JESSICA holding fund' measure will help with the objective of reducing energy consumption in residential houses, dormitories belonging to state high schools and professional training establishments, and encourage integrated city development activities.

The aim of the measure is to improve the funding conditions for projects in the area of improving the energy efficiency of the housing sector, encourage renovation (modernisation) of residential buildings and dormitories by property owners, state high schools and professional training establishments, in order to improve their energy qualities and living environment and encourage integrated city development activities in municipalities.

3. The measure 'Promotion of renovation of multi-apartment buildings' will help with the objective of reducing the energy costs for heating multi-apartment buildings and reducing CO₂ emissions, and will improve the living conditions of property owners.

The aim of the measure is to encourage the owners of apartments to modernise their multi-apartment houses with inefficient energy consumption.

4. The aim is to modernise most residential buildings built under construction permits issued prior to 1993, to reduce heating energy costs by up to 30%, compared to the heating energy costs prior to renovation (modernisation) and to reduce carbon dioxide emissions by about 400 thousand tonnes per year

The aim of the measure is to encourage the owners of apartments in multi-apartment buildings to renovate (modernise) multi-apartment buildings, in order to improve living quality and make rational use of energy resources.

Note: the programme is to be continued during the new 2014-2020 financial period.

7.1.2 Relevant economic incentives and financing instruments

The use of the funds provided under the **Special Programme for Climate Change** will enable energy consumption to be reduced and production efficiency to be increased. This will be achieved by modernising residential and public buildings; renovating (modernising) public buildings by reducing energy consumption, renovating (modernising) one or two-apartment residential houses belonging to natural persons and private legal entities, by achieving class C building energy performance and by reducing energy consumption by at least 20%; constructing a public building with passive or low energy consumption or renovating (modernising) public buildings in order to

achieve low or passive energy consumption.

In addition, these funds will encourage the use of renewable energy resources, and the implementation of environmentally friendly technologies, including effective energy production by means of cogeneration: use of renewable energy resources (solar, wind, geothermal energy, biofuel and etc.) in public buildings; and use of renewable energy resources (solar, wind, geothermal energy, biofuel and etc.) in individual residential buildings.

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

- Certification requirements for existing and refurbished existing buildings came into force on January 2009
- mandatory certification of the building before and after renovation
- certificate provides information about opportunities to improve building energy efficiency
- certificate provides links where is information about the energy efficiency improvement programs

7.1.4 Supervision (energy advice and audits)

7.1.5 Information (tools)
There is information about the energy efficiency of buildings through the media, news releases of the ministries and agencies.

7.1.6 Demonstration

7.1.7 Education and training
There are special workshops and courses for building certification experts, designers and building owners

7.2 Non-residential buildings

7.2.1 Relevant regulations

Law on Renewable Energy Resources

From 1 January 2012 new and existing buildings belonging to state and municipal bodies and companies and requiring major renovation must comply with the requirements for the use of renewable energy resources.

Under the Cohesion Promotion Action Programme (for 2007-2013)

1. The 'JESSICA holding fund' measure will help with the objective of reducing energy consumption in residential houses, dormitories belonging to state high schools and professional training establishments, and encourage integrated city development activities. The aim of the measure is to improve the funding conditions for projects in the area of improving the energy efficiency of the housing sector, encourage renovation (modernisation) of residential buildings and dormitories by property owners, state high schools and professional training establishments, in order to improve their energy qualities and living environment and encourage integrated city development activities in municipalities.

2. The measure 'Renovation of public buildings at national level' will help with the objective of improving energy production and consumption efficiency and the use of renewable energy resources.
The aim of the measure is to reduce the amount of energy consumed in buildings.

3. The measure 'Renovation of public buildings at regional level' will help with the objective of increasing energy production and consumption efficiency and the use of renewable energy resources.
The aim of the measure is to reduce the amount of energy consumed in buildings.

4. The measure 'Projects for the renovation of public buildings in line with the benefit and quality criteria of measure 1.2 'Ensuring stability of energy supply, accessibility and higher energy efficiency' contained in the Lithuanian Single Programming Document for 2004-2006 will help with the objective of increasing energy production and consumption efficiency and the consumption of renewable energy resources.

The aim of the measure is to reduce the energy consumed in buildings.

7.2.2 Relevant economic incentives and financing instruments

The use of the funds provided under the **Special Programme for Climate Change** will enable energy consumption to be reduced and production efficiency to be increased. This will be achieved by modernising residential and public buildings; renovating (modernising) public buildings by reducing energy consumption, renovating (modernising) one or two-apartment residential houses belonging to natural persons and private legal entities, by achieving class C building energy performance and by reducing energy consumption by at least 20%; constructing a public building with passive or low energy consumption or renovating (modernising) public buildings in order to achieve low or passive energy consumption.

In addition, these funds will encourage the use of renewable energy resources, and the implementation of environmentally friendly technologies, including effective energy production by means of cogeneration: use of renewable energy resources (solar, wind, geothermal energy, biofuel and etc.) in public buildings; and use of renewable energy resources (solar, wind, geothermal energy, biofuel and etc.) in individual residential buildings.

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

- Certification requirements for existing and refurbished existing buildings came into force on January 2009
- mandatory certification of the building before and after renovation
- certificate provides information about opportunities to improve building energy efficiency
- certificate provides links where is information about the energy efficiency improvement programs

7.2.4 Supervision (energy advice and audits)

Mandatory energy audits of non residential building

7.2.5 Information (tools)

There is information about the energy efficiency of buildings through the media, news releases of the ministries and agencies

7.2.6 Demonstration

7.2.7 Education and training

There are special workshops and courses for building certification experts, designers and building owners

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?

From 2014 January, minimum energy performance requirements for buildings after renovation is class C (cost-optimal level according to Article 5 of Directive). Practice shows that with proper information, designers design a higher energy performance of buildings than set in minimum requirements.

8 Additional Information

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

The Law of the Republic of Lithuania on Construction (Official Gazette, 1996, No 32- 788; 2001, No 101-3597) provides for minimum energy performance requirements for all buildings in Lithuania, and the Construction Technical Regulation STR 2.01.09:2012 'Energy Efficiency of Buildings. Energy Efficiency Certification' (hereinafter referred to as 'CTR') (Official Gazette, 2012, No 99-5071) establishes requirements for evaluating energy performance.

The calculation method referred to in the standard LST EN 15217:2007 'Energy performance of buildings – Methods for expressing energy performance and for energy certification of buildings' is used for evaluating energy performance of buildings. In Lithuania, energy performance is unrelated to particular numerical value of energy consumption and is defined by the respective class of energy performance of the building.

According to energy performance, buildings are classified into 9 classes: A++, A+, A, B, C, D, E, F, G.

The Lithuanian legislation setting requirements for the energy performance of buildings does not use reference buildings. Each building is assessed individually. The requirements are based on the following principle: the legislation sets regulatory requirements for the heat characteristics of building envelopes, efficiency of engineering systems (cooling, preparation of domestic hot water, indoor lighting), energy consumption for cooling the building and other indicators for different buildings of class D, C, B, A, A+, A++. The legislation lays down analogous indicators for reporting buildings (of class D and E) (average indicator values of 50% of certain buildings using the lowest amount of energy).

The energy performance class of the building is identified on the basis of the following building indicator values (the compliance of all those values with the legislative requirements is assessed):

- calculated specific heat losses of building envelopes;
- building air-tightness;
- technical indicators for mechanical cooling system with recuperation;
- C_1 indicator value of energy efficiency of the building, characterising primary non-renewable energy efficiency for heating, ventilation, cooling and lighting;
- C_2 indicator value of energy efficiency of the building, characterising primary non-renewable energy efficiency for preparing domestic hot water;
- part of renewable energy used in the building.

Once the energy performance class of the building has been identified, the actual indicators of the building are checked against the normative indicators for the respective energy performance class.

According to the established indicators, a building of class A++ [nearly zero-energy buildings comply with class A++] must comply with the applicable parameters:

1. values C_1 and C_2 of energy efficiency indicators of the building must comply with the requirements of the Regulation, i.e. $C_1 < 0.25$ and $C_2 \leq 0.70$;
2. calculated specific heat losses of building envelopes must not exceed the normative heat losses;
3. air-tightness of the building must comply with the requirements of the Regulation, i.e. in case of pressure difference of 50 Pa between the inside and outside of the building, air circulation must not exceed 0.6 times per hour;
4. if a building is equipped with a mechanical ventilation system with recuperation, the recuperator performance ratio shall be at least 0.90, and the amount of energy used by a recuperator ventilator must not exceed 0.45 Wh/m^3 ;
5. a part of energy from renewable resources consumed in the building shall comply with the requirements of the Regulation, i.e. in buildings of class A++, energy from renewable resources must form the largest part of energy consumed. A part of renewable energy consumed in the building K_{ers} (units) must be higher than 1 and needs to be calculated as follows:

$$K_{ers} = \frac{Q_{PRr} - Q_{PRr(H)} - Q_{PRr(C)}}{Q_{PRn} - \sum_{m=1}^{12} Q_{E,eq,m} \cdot f_{PRnE} - \sum_{m=1}^{12} Q_{E,e,m} \cdot f_{PRnE}}$$

where $(Q_{PRn} - \sum_{m=1}^{12} Q_{E,eq,m} \cdot f_{PRnE} - \sum_{m=1}^{12} Q_{E,e,m} \cdot f_{PRnE}) \leq 0$

it is to be considered that the building uses only renewable energy, provided that the requirement $K_{ers} > 1$ is satisfied;

where:

$Q_{PRr(H)}$ means inefficiently consumed renewable energy in the building, where there is no energy requirement for cooling the building (kWh/(m²*year)). This amount of energy shall be calculated on the basis of the 'm' data pertaining to particular months, where there is no cooling requirement;

$Q_{PRr(C)}$ means inefficiently consumed renewable energy in the building, where there is energy requirement for cooling the building (kWh/(m²*year)). This amount of energy shall be calculated on the basis of the 'm' data pertaining to particular months, where there is a cooling requirement;

$Q_{E,eq,m}$ means energy costs pertaining to a particular month 'm' (kWh/(m²*month)) of equipment existing in the heated premises of the building, i.e. energy costs not attributed to the energy performance indicators of the building.

$Q_{E,e,m}$ – electricity costs in an unheated area of the building pertaining to a particular month 'm' for other needs related to the purpose of the building (kWh/(m²*month)), i.e. energy costs unrelated to energy performance indicators of the building;

$f_{PRn.E}$ means non-renewable primary energy factor for electricity (mean of different electricity production methods).

In line with the provisions of the Regulation, after assessing a sufficiently typical building area of 150-200 m² complying with class A++ building requirements, where biofuel is used for heating and preparing hot water:

- its non-renewable primary energy costs for heating, cooling and lighting – 7 kWh/m² of the heated building area per year and renewable energy forms the largest part of energy consumed in such a building;
- non-renewable primary energy costs for preparing hot domestic water – 5 kWh/m² of the heated building area per year.

Construction permit documents, issued for residential building constructions in 2009-2011

Year	Number of construction permit documents, in units
2011	4 824
2010	5 876
2009	5 994

Of which - construction permit documents issued for one and two-apartment residential buildings:

Year	Number of construction permit documents, in units
2011	4 734
2010	5 764
2009	5 938

Of which – construction permit documents issued for two and more apartment residential buildings (multi-apartment buildings):

Year	Number of construction permit documents, in units
2011	90
2010	112
2009	56



Number of residential building constructions authorised in 2009-2011 according to the construction permit documents:

Year	Number of residential building constructions authorised, in units
2011	4 951
2010	5 961
2009	6 021

Of which – construction permits for one and two-apartment residential buildings:

Year	Number of residential building constructions authorised, in units
2011	4 854
2010	5 848
2009	5 964

Of which – construction permits for three and more apartment residential buildings:

Year	Number of construction permit documents, in units
2011	86
2010	106
2009	56

Useful area of apartment constructions authorised in 2009-2011 on the basis of construction permit documents:

Year	Useful area of the apartment constructions authorised, thousand m ²
2011	948.2
2010	1 107.7
2009	1 077.1

Of which – useful area of apartments in the one or two-apartment residential building constructions authorised:

Year	Useful area of apartment constructions authorised, m ²
2011	800.6
2010	951.9
2009	979.1

Of which – useful area of three and more apartment residential building constructions authorised:

Year	Useful area of apartment constructions authorised, m ²
2011	147.6
2010	155.8
2009	98.0



Number of apartment constructions authorised in 2009-2011 with construction permit documents:

Year	Number of apartment constructions authorised, in units
2011	7 290
2010	8 319
2009	7 553

Of which – apartment constructions authorised in one and two-apartment residential buildings:

Year	Number of apartment constructions authorised, in units
2011	4 854
2010	5 848
2009	5 964

Of which – apartment constructions authorised in three and more apartment residential buildings:

Year	Number of apartment constructions authorised, in units
2011	2 136
2010	2 118
2009	1 321

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.

Annex- Definition of nZEB

1. General Information		
Country	Lithuania	
Name of regulation ,directive, certification scheme	Law on Renewable Energy, on Construction, Construction Technical Regulation STR 2.01.09:2012 "Energy performance of buildings. Certification of Energy performance", Construction Technical Regulation STR 2.05.01:2013 „Design of Energy Performance of Buildings“	
Editor of regulation, directive, certification scheme	Ministry of Environment, Ministry of Energy	
Year of introduction of current version	2012	
benchmark of current version (Select one)	<input type="radio"/> Energy Autonomous building <input type="radio"/> Efficient buildings <input type="radio"/> Net zero energy buildings <input type="radio"/> Plus energy buildings <input checked="" type="radio"/> Nearly zero energy buildings <input type="radio"/> Zero energy buildigns <input type="radio"/> Other	
Integration and consideration in national directive	Please add explanation/ comment/ source considered	
2. Field of Application		
2.1 Building category Select one and describe right is this typology included in the directive? Are special requirements or exceptions defined for this typology? If more than one definition exists, you can duplicate this appendix for each of them. <i>Member States shall ensure that all new buildings are nearly zero- energy buildings by 31 December 2020 respectively after 31 December 2018 (occupied and owned by public authorities). For the purpose of the calculation buildings should be adequately classified into the [...] categories. References: EPBD article 9.1a/b, EPBD Annex I.</i>		
Category <input type="radio"/> Residential <input type="radio"/> Non-residential <input checked="" type="radio"/> Residential and Non-residential	Please add explanation/ comment/ source	
single family houses	included in the directive	Please add explanation/ comment/ source
apartment blocks	included in the directive	Please add explanation/ comment/ source
Offices	included in the directive	Please add explanation/ comment/ source
educational buildings	included in the directive	Please add explanation/ comment/ source
hospitals	included in the directive	Please add explanation/ comment/ source
hotels and restaurants	included in the directive	Please add explanation/ comment/ source
sports facilities	included in the directive	Please add explanation/ comment/ source
wholesale and retail trade service buildings	included in the directive	Please add explanation/ comment/ source
other types of energy-consuming buildings	included in the directive	Please add explanation/ comment/ source
2.2 New/retrofit buildings		
Select one and describe right. If more than one definition exists, you can duplicate this appendix for each of them. <i>New, and existing buildings that are subject to major renovation, should meet minimum energy performance requirements adapted to the local climate.</i>		

<p>Member States shall furthermore [...] stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings. Reference: EPBD preamble recital 15, EPBD article 9.2.</p>	
<input type="radio"/> New buildings <input type="radio"/> Retrofit <input checked="" type="radio"/> New and retrofit	<p>Please add explanation/ comment/ source</p>
<p>2.3 Private/public buildings Select one and describe right. If more than one definition exists, you can duplicate this appendix for each of them.</p>	
<p>Member States shall ensure that by 31 December 2020, all new buildings are nearly zero- energy buildings and after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings. Reference: EPBD article 9.1a/b</p>	
<input type="radio"/> Private <input type="radio"/> Public <input checked="" type="radio"/> Public and private	<p>Please add explanation/ comment/ source</p>
<p>3. Energy Balance and calculation</p>	
<p>3.1 Balance Type Describe how renewable energy is calculated / included in the energy balance (e.g. renewable heat from solar thermal collectors reduces energy use for heat and DHW; renewable electricity reduces/compensates delivered electricity). [...] 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 Energy performance of a building means the calculated or measured amount of energy needed to meet the energy demand [...]. Reference: EPBD article 2.2, EPBD article 2.4</p>	
<input checked="" type="radio"/> energy demand vs energy generation <input type="radio"/> energy import vs energy export <input type="radio"/> virtual balance between demand and generation <input type="radio"/> not specified <input type="radio"/> other	<p>A part of energy from renewable resources consumed in the building shall comply with the requirements of the Construction Technical Regulation STR 2.01.09:2012, i.e. in buildings of class A++, energy from renewable resources must form the largest part of energy consumed. A part of renewable energy consumed in the building K(ers) must be higher than 1 (>50% energy from renewable sources) . Calculation method given in the national report. Each energy source renewable energy and non-renewable primary energy factors evaluated. One of the criteria for establishing the building's energy efficiency class - building a non-renewable primary energy relationship with the norm and the references of power consumption. There is no so-called "renewable sources", where are not part of the primary non-renewable energy. Renewable sources of "non-renewable primary energy factors are smaller than the renewable primary energy factor values. Therefore, when the building uses energy from sources that are renewable primary energy, building non-renewable primary energy relations with regulatory and energy efficiency reference values for cost decreases and this allows the building to achieve higher energy efficiency class.</p>
<p>3.2 Physical boundary Select the widest possible boundary and describe right if/which further subdivisions are possible This directive lays down requirements as regards the common general framework for [...] buildings and building units. [...] building' means a roofed construction having walls, for which energy is used to condition the indoor climate. Reference: EPBD article 1.2, EPBD article 2.1</p>	
<input checked="" type="radio"/> single building <input type="radio"/> building unit <input type="radio"/> building unit <input type="radio"/> building site <input type="radio"/> cluster of buildings <input type="radio"/> quarter or city <input type="radio"/> other	<p>Please add explanation/ comment/ source</p>
<p>3.3 System boundary demand / energy uses included</p>	

Define if this load sector is included in the energy balance calculation (other requirements like maximum consumption values can be described below under item 5, further requirements).		
[...] energy performance of a building means the calculated or measured amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting. Reference: EPBD article 2.4		
space heating, domestic hot water	considered	Please add explanation/ comment/ source
ventilation, cooling, air conditioning	considered	Please add explanation/ comment/ source
auxiliary energy	considered	Please add explanation/ comment/ source
lighting	considered	Please add explanation/ comment/ source
plug loads, appliances, IT	considered	Please add explanation/ comment/ source
central services	not considered	Please add explanation/ comment/ source
electric vehicles	considered	Please add explanation/ comment/ source
embodied energy	considered	Please add explanation/ comment/ source
3.4 System boundary generation / renewable energy sources included Select and explain right (e.g. only in building's physical footprint, on-site, on-site incl. import of off-site renewables like pellets, wood chips, rape oil etc.). How is CHP (based on non-renewable energy carriers like natural gas or oil) included?		
[...] 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. [...] energy from renewable sources means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. [...] minimum levels of energy from renewable sources [...] to be fulfilled, inter alia, through district heating and cooling [...]. Reference: EPBD article 2.2, EPBD article 2.6, EPBD article 13.4		
generation on-site	considered	Please add explanation/ comment/ source
generation near by	considered	Please add explanation/ comment/ source
generation external	considered	Please add explanation/ comment/ source
crediting	not considered	Please add explanation/ comment/ source
3.5 Balance period / calculation step What is the defined period of time over which the balance is calculated? Is the calculation period divided into calculation steps (e.g. one hour, one month or one heating and/or cooling season)?		
[...] The methodology for calculating energy performance should be based not only on the season in which heating is required, but should cover the annual energy performance of a building [...]. Reference: EPBD preamble recital 9 [...] requirements should be set with a view to [...] the cost-optimal balance between the investments involved and the energy costs saved throughout the lifecycle of the building [...] Reference: EPBD preamble recital 10.		
<input type="radio"/> Life cycle balance <input checked="" type="radio"/> Yearly <input type="radio"/> Seasonal <input type="radio"/> Other	Details given in Construction Technical Regulation STR 2.01.09:2012 Building energy consumption is calculated every month. For identification energy performance class of the building are used yearly energy consumption.	
3.6 Monthly accounting limitation Is a monthly accounting limit defined? Is it based on end energy (e.g. monthly electricity generation compensates monthly electricity loads) or on primary energy (any monthly generation compensates any loads)? Are surpluses transferred to an annual balance?		
<input type="radio"/> monthly source based end energy crediting <input checked="" type="radio"/> monthly primary energy crediting <input type="radio"/> nothing defined <input type="radio"/> other	Only those primary energy which consumed in the building. If power is supplied from the building to outside (eg. other buildings) - this is not characteristic of the building, it is the business of building user or owner.	
4. Accounting system		
4.1 Normalization		
[...] including a numerical indicator of primary energy use expressed in kWh/m ² per year. Reference: EPBD article 9.3a		
Monthly and annual primary energy costs are calculated per unit area of the		

<ul style="list-style-type: none"> <input type="radio"/> person <input checked="" type="radio"/> gross floor area <input type="radio"/> net floor area <input type="radio"/> gross volume <input type="radio"/> net volume <input type="radio"/> usable floor area <input type="radio"/> treated floor area <input type="radio"/> conditioned area <input type="radio"/> other 	<p>heated building. Building energy efficiency class is determined by the energy efficiency indicators C1 and C2 values. Class shall be determined as specified in EN 15217, which ratios are used to describe a building's energy consumption in relation to "normative" and "the reference" building. EN 15217 does not provide for the energy efficiency class in accordance with the method of determining absolute building primary energy consumed, these absolute amounts of energy (kWh / m² per year) the energy efficiency class of the unused and rationed.</p>
<p>4.2 Primary metric</p> <p>Indicate which metric is used for the energy performance calculation / energy balance and give input on (the source of) the conversion factors on the right. Possible sources are e.g. EN 15603 or national and regional codes.</p>	
<p><i>The energy performance of a building shall be expressed in a transparent manner and shall include an energy performance indicator and a numeric indicator of primary energy use, based on primary energy factors per energy carrier, which may be based on national or regional annual weighted averages or a specific value for on-site production. Reference: EPBD Annex 1.</i></p> <p><i>[...] including a numerical indicator of primary energy use expressed in kWh/m² per year. Reference: EPBD 9.3a</i></p> <p><i>[...] primary energy' means energy from renewable and non-renewable sources which has not undergone any conversion or transformation process. Reference : EPBD article 2.5</i></p>	
<ul style="list-style-type: none"> <input type="radio"/> energy need <input type="radio"/> energy use <input type="radio"/> delivered/site energy <input checked="" type="radio"/> primary / source energy (renewable part included) <input type="radio"/> primary / source energy (renewable part not included) <input type="radio"/> (equivalent) carbon emissions <input type="radio"/> exergy <input type="radio"/> energy costs <input type="radio"/> environmental credits <input type="radio"/> points (labeling system) <input type="radio"/> other 	<p>Building energy efficiency class is determined by building non-renewable and renewable primary energy consumption indicators. Non-renewable and renewable primary energy costs are calculated according to the method provided by EN 15603</p> <p>Details given in Construction Technical Regulation STR 2.01.09:2012</p>
<p>4.3 Secondary metric</p>	
<ul style="list-style-type: none"> <input checked="" type="radio"/> energy use <input type="radio"/> energy need <input type="radio"/> delivered/site energy <input type="radio"/> primary / source energy (renewable part included) 	<p>Building must meet the requirements of the primary energy consumption indicators plus the relevant energy efficiency class of the building regulatory requirements laid down the cost of energy to heat the building. Regulatory requirements for energy consumption for heating the building establish the uses of B, A, A + and A + + class buildings.</p>

<ul style="list-style-type: none"> <input type="radio"/> primary / source energy (renewable part not included) <input type="radio"/> (equivalent) carbon emissions <input type="radio"/> exergy <input type="radio"/> energy costs <input type="radio"/> environmental credits <input type="radio"/> points (labeling system) <input type="radio"/> other 	
4.4 Symmetric or asymmetric weighting	
<ul style="list-style-type: none"> <input checked="" type="radio"/> symmetrical weighting <input type="radio"/> asymmetrical weighting 	Please add explanation/ comment/ source
<p>4.5 Time dependent weighting</p> <p>Static: no time dependent weighting (annual constant weighting/factors) Quasi-static: seasonal/monthly average weighting factors Dynamic: weighting factors based on shorter time periods /hourly basis (according to energy offer and demand in the grid)</p>	
<p><i>Primary energy factors [...] may be based on national or regional yearly average values and may take into account [...] European standards. Reference: EPBD 9.3a</i></p>	
<ul style="list-style-type: none"> <input checked="" type="radio"/> static conversion factors <input type="radio"/> quasi static conversion factors <input type="radio"/> dynamic conversion factors 	<p>Non-renewable and renewable primary energy factor values used in the calculations for different energy sources are fixed and given in Construction Technical Regulation STR 2.01.09:2012.</p>
5. Further requirements	
<p>5.1 Fraction of renewables</p> <p>Select and describe right if guidelines are given for any fraction of renewable energy and indicate how/at which level a certain fraction is calculated (e.g. solar thermal heat might be a fraction of energy use, electricity from PV a fraction of delivered energy.)</p>	
<p><i>Member States shall introduce [...] appropriate measures [...] to increase the share of all kinds of energy from renewable sources in the building sector [...]. By 31 December 2014, Member States shall [...] require the use of minimum levels of energy from renewable sources in new buildings and in existing buildings [...] Reference: RED article 13.4</i></p> <p><i>[...] The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources [...] Reference : EPBD article 2.2</i></p>	
<ul style="list-style-type: none"> <input checked="" type="radio"/> defined <input type="radio"/> not defined <input type="radio"/> defined in other regulation 	<p>A part of energy from renewable resources consumed in the building shall comply with the requirements of the Construction Technical Regulation STR 2.01.09:2012 i.e. in buildings of class A++, energy from renewable resources must form the largest part of energy consumed. A part of renewable energy consumed in the building Kers (units) must be higher than 1 and needs to be calculated. See also explanations in paragraphs 3.1 and 4.1.</p>
<p>5.2 Temporal performance</p> <p>Describe if any requirements are given for a temporal match between on-site energy load and on-site energy generation (load match) and which calculation procedures are applied.</p>	
<p>Load match</p> <ul style="list-style-type: none"> <input type="radio"/> defined 	Please add explanation/ comment/ source

<input checked="" type="radio"/> not defined	
<p>Grid interaction</p> <p><input type="radio"/> defined</p> <p><input checked="" type="radio"/> not defined</p>	<p>Please add explanation/ comment/ source</p>
<p>5.3 Energy performance or rating requirements</p> <p>Are limitations given for a standard energy rating, an energy indicator or maximum demands for heating, cooling, embodied energy, demand of appliances, etc.? If yes, type the values and give explanations on the right</p>	
<p><i>nearly zero-energy building means a building that has a very high energy performance [...]. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources [...]</i></p> <p><i>The energy performance [...] shall [...] include an energy performance indicator and a numeric indicator of primary energy use [...]. Reference : EPBD article 2.2, EPBD Annex 1.</i></p>	
<p>Performance or rating</p> <p><input checked="" type="radio"/> defined</p> <p><input type="radio"/> not defined</p> <p><input type="radio"/> defined in other regulation</p>	<p>In addition to the requirements of the relevant energy efficiency class of building energy efficiency index values of C1 and C2, which describes of renewable and non-renewable primary energy consumption of the building, there are regulatory requirements for maximum permissible thermal energy consumption for heating of the building. See also explanations in point 4.3.</p>
<p>Energy Performance indicator</p> <p>Is an energy performance indicator defined? If yes, type the values and the according unit.</p>	<p>According to the established indicators, a building of class A++ [nearly zero-energy buildings comply with class A++] must comply with the applicable parameters:</p> <ol style="list-style-type: none"> 1. values C1 and C2 of energy efficiency indicators of the building must comply with the requirements of the Regulation, i.e. $C1 < 0.25$ and $C2 \leq 0.70$; 2. calculated specific heat losses of building envelopes must not exceed the normative heat losses; 3. air-tightness of the building must comply with the requirements of the Regulation, i.e. in case of pressure difference of 50 Pa between the inside and outside of the building, air circulation must not exceed 0.6 times per hour; 4. if a building is equipped with a mechanical ventilation system with recuperation, the recuperator performance ratio shall be at least 0.90, and the amount of energy used by a recuperator ventilator must not exceed 0.45 Wh/m³; 5. a part of energy from renewable resources consumed in the building shall comply with the requirements of the Regulation, i.e. in buildings of class A++, energy from renewable resources must form the largest part of energy consumed. A part of renewable energy consumed in the building Kers (units) must be higher than 1 and needs to be calculated.
<p>Numeric indicator of primary energy use</p> <p>Is a numeric indicator of primary energy use defined? If yes, type the values and the according unit.</p>	<p>See explanations in point 4.3.</p>
<p>5.4 General framework / prescriptive requirements</p> <p>Describe which guidelines are given for:</p> <p>Thermal characteristics (insulation, thermal bridges, thermal capacity, passive heating, internal loads, solar protection)</p> <p>Efficiency of installations (hot water supply, air-conditioning, lighting fan power)</p>	
<p><i>The methodology shall [...] take into consideration: thermal characteristics (thermal capacity, insulation, passive heating, cooling elements, and thermal bridges), heating installation and hot water supply, air-conditioning installations, natural and mechanical ventilation, built-in lighting, the design, positioning and orientation of the building, outdoor climate, passive solar systems and solar protection, [...], internal loads. Reference: EPBD Annex 1</i></p>	
<p><input checked="" type="radio"/> defined</p>	<p>All mentioned requirements of EPBD Annex 1 are included in Construction Technical Regulation STR 2.01.09:2012</p>

<input type="radio"/> not defined <input type="radio"/> defined in other regulation	
<p>5.5 Definition of comfort level & IAQ requirements (for winter and summer season, beside other national directives)</p> <p>Describe which guidelines are given for indoor climatic conditions, minimum or maximum indoor temperature, minimum lighting levels/ daylight availability, minimum ventilation rates/ natural ventilation, indoor air quality, max. CO2 levels, etc.</p>	
<p><i>This Directive [...] takes into account [...] indoor climate requirements [...] Reference: EPBD article 1.1</i> <i>The methodology shall [...] take into consideration: [...] indoor climatic conditions [...] Reference: EPBD Annex 1</i> <i>That includes [...] indoor air-quality, adequate natural light [...]. Reference: EPBD preamble recital 9</i></p>	
<input checked="" type="radio"/> defined <input type="radio"/> not defined <input type="radio"/> defined in other regulation	<p>Indoor temperature and ventilation rate are defined in Construction Technical Regulation STR 2.01.09:2012 , but other parameters not. Please add explanation/ comment/ source</p>
<p>5.6 Monitoring procedure</p> <p>Describe if and how a monitoring mandatory is formulated; calculated or measured values are used; an evaluation of the indoor environmental quality is considered; which calculation step is used.</p>	
<p><i>[...] energy performance of a building means the calculated or measured amount of energy needed [...] Reference: EPBD article 2.4</i> <i>Member States shall encourage the introduction of intelligent metering systems [...] and the installation of automation, control and monitoring systems [...]. Reference: EPBD article 8.2</i></p>	
<input checked="" type="radio"/> defined <input type="radio"/> not defined	<p>EPBD article 8.2 are implemented by establishing a requirement in other legal acts that are mandatory for all buildings (including NZEB).</p>

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