

Implementation of the EPBD in Lithuania

STATUS IN DECEMBER 2014

1. Introduction

The Energy Performance of Buildings Directive (Directive 2010/31/EU - EPBD) sets out numerous requirements including the certification of buildings' energy performance, inspection regimes for boilers and Air-Conditioning (AC) systems, and requirements for new Nearly Zero-Energy Buildings (NZEBs). The EPBD also sets minimum energy performance standards for buildings undergoing renovation. Together, the Energy Efficiency Directive (EED) and the EPBD provide a framework to reduce energy use in buildings, thereby delivering a range of economic, environmental, societal and energy security benefits. The Ministry of Environment and the Ministry of Energy are jointly responsible for the transposition and implementation of the EPBD in Lithuania.

The EPBD and national calculation methods of cost-optimal levels of minimum energy performance requirements were transposed into Lithuanian legislation in time, and now Lithuania is in the process of implementing its requirements. The main requirements were introduced into Lithuanian legislation through the Law on Construction and the Law on Energy, and are further detailed in technical regulations, splitting energy efficiency requirements into all steps of planning, designing and constructing buildings.

2. Current status of Implementation of the EPBD

I. ENERGY PERFORMANCE REQUIREMENTS

I.i. Progress and current status

Energy certification as a mandatory requirement for new buildings came into force on 1 January 2007. New buildings (building units) must be certified after construction has been completed. The energy performance class of new buildings (building units) may not be lower than B, when the building permit is granted after 1 January 2014. The permit for construction will not be issued if the energy efficiency class of the designed building is not in line with mandatory requirements. After the building is finished, it must fully comply with the requirements.

When buildings (building units) are offered for sale or for rent, the energy performance indicator, which is part of the Energy Performance Certificate (EPC) of the building (or building unit) should be stated in advertisements in commercial media. This requirement came into force on 9 January 2013.

Renovated or refurbished buildings, when the cost of renovation works amounts to more than 25% of the building's value, must conform to the following energy performance requirements:



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NATIONAL WEBSITES

www.am.lt, www.enmin.lt, www.spsc.lt, www.betal.lt, www.ena.lt, www.vei.lt

- a) For permits for construction works obtained before 1 January 2014, the energy performance class after major renovation must not be lower than D.
- b) For permits for construction works obtained after 1 January 2014, the energy performance class after major renovation must not be lower than C.

The requirements for energy performance class are not obligatory for existing buildings or building units for sale or rent, but the evaluation procedure and certification requirements for existing buildings and following major renovation are in force since 1 January 2009.

The energy performance class of large buildings or building units with a heated area (total useful floor area) over 500 m² occupied by a public authority and frequently visited by the public, after major renovation, must not be lower than D. This requirement came into force on 9 January 2013.

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

The main provisions on the energy performance of buildings are described in the Law on Construction and the Law on Energy of the Republic of Lithuania. The calculation procedure is defined in Building Technical Regulation STR 2.01.09:2012 "Energy Performance of Buildings; Certification of Energy Performance", adopted on 21 August 2012 by Order No. D-1-674 of the Minister of Environment. The Building Technical Regulation came into force on 9 January 2013 and is an amended version of a previous regulation. The new version includes many essential amendments, including an inter alia definition of low energy buildings - buildings of energy efficiency class B, A, A⁺ and Nearly Zero Energy Buildings (NZEB) as class A⁺⁺ buildings.

The building energy performance class is determined in accordance with the values of the following 8 parameters:

- 1) the calculated specific heat loss of the building envelope;
- 2) energy consumption for heating the building;
- 3) building airtightness;
- 4) technical indicators of mechanical ventilation, including heat recovery system;
- 5) thermal properties of partitions between the floors and spans;
- 6) building energy performance indicator C₁ value, describing the non-renewable

primary energy efficiency of heating, ventilation, cooling and lighting;

- 7) building energy performance indicator C₂ value describing the primary non-renewable energy efficiency for Domestic Hot Water (DHW);
- 8) building energy consumption of renewable resources.

All parameters are equally important, and no priority is given to one of them when determining the energy performance class. However, the best classes require calculation of more parameters than the lower classes. For example, for energy classes A⁺⁺, A⁺, A and B, it is mandatory to calculate both the C₁ and C₂ parameters, but for any other energy class it is only mandatory to calculate C₁:

- > A⁺⁺ class: C₁ < 0.25 and C₂ ≤ 0.70;
- > A⁺ class: 0.25 ≤ C₁ < 0.375 and C₂ ≤ 0.80;
- > A class: 0.375 ≤ C₁ < 0.5 and C₂ ≤ 0.85;
- > B class: 0.5 ≤ C₁ < 1 and C₂ ≤ 0.99;
- > C class: 1 ≤ C₁ < 1.5;
- > D class: 1.5 ≤ C₁ < 2;
- > E class: 2 ≤ C₁ < 2.5;
- > F class: 2.5 ≤ C₁ < 3;
- > G class: C₁ ≥ 3.

For example, for classes up to B, thermal bridges can be calculated in a precise way, or simply characterised by using tabulated default values from STR 2.01.09:2012. For A, A⁺ and A⁺⁺ classes, thermal bridges must be calculated individually. Passive solar protection devices must be calculated for all classes. Calculation of the portion of energy consumption from renewable resources is possible for all classes, but mandatory only for the A⁺ and A⁺⁺ classes.

The system allows for setting up requirements for all types of buildings and intended uses, and even for various sizes and shapes of buildings, without setting out absolute values for primary energy consumption, which would vary significantly for different indoor temperatures (e.g., +5 °C for storage buildings and +20 °C for residential buildings). When calculating the C₁ parameter values, all the minimum requirements are to be respected. Furthermore, the system allows for increased requirements for all performance classes without changing the classification and calculation methods. Such changes of requirements have taken place twice in Lithuania since Directive 2002/91/EC was implemented. The system allows for setting minimum requirements for certain parameters and certain classes. It provides opportunities for a continuous but flexible system respecting central

aspects for certain classes. See other sections of this report for examples.

The calculation procedure in STR 2.01.09:2012 is based on the methodology included in standards EN 15217:2005 and EN 15603. The tabulated values in STR 2.01.09:2012 have been updated and enhanced.

The calculation software tool has been updated according to the above changes as well. The tool also allows separate calculation for several parts of the building with different requirements.

I.iii. Cost-optimal procedure for setting energy performance requirements

The new Building Technical Regulation STR 2.01.09:2012 includes the requirements for cost-optimal levels of minimum energy performance requirements for all categories of buildings, new and existing. The requirements conform to the requirements established for energy class C buildings.

New buildings

The cost-optimal requirements for new, single-family, multi-family, office and education buildings are based on the 'financial perspective' calculation using a real discount rate of 3% (based on calculations from 1,080 cases).

According to the results of the calculation, the difference between cost-optimal levels of new buildings and normative requirements of the Regulation No. 244/2012 delegated by the EU Commission range approximately between -34% up to 2016 (Class B), and -10% after 2016 (Class A).

The requirements for cost-optimal levels of minimum energy performance conform to the requirements established in the national regulation for class A buildings. The national regulation decrees that the energy performance class of new buildings and/or building units must not be lower than B when the construction permit is granted after 1 January 2014, and it must not be lower than A when the construction permit is granted after 1 January 2016.

Requirements for new residential building envelope heat transfer coefficients (U, W/m².K) and thermal resistances (R, m².K/W) were set out many years before the EPBD came into force. The requirements of different regulations are compared in Table 1.

STR 2.01.09:2012 normative requirements for thermal insulation of residential building envelopes are presented in Table 2.

STR 2.01.09:2012 sets out the overall U-factor U(A) (W/m².K) values for calculation of specific heat losses for

Building envelope element	Till 1992	From 1992	From 1999	From 2005	Class A From 2016	Class A ⁺⁺ From 2020
Roofs	0.85 (1.2)	0.25 (4.0)	0.18 (5.6)	0.16 (6.3)	0.10 (10)	0.08 (12.5)
Walls	1.27 (0.8)	0.30 (3.3)	0.26 (3.8)	0.20 (5.0)	0.12 (8.3)	0.10 (10)
Floors	0.71 (1.4)	0.30 (3.3)	0.26 (3.8)	0.25 (4.0)	0.14 (7.1)	0.10 (10)
Windows	2.5 (0.40)	1.9 (0.53)	1.9 (0.53)	1.6 (0.63)	1.0 (1.0)	0.70 (1.4)
Doors	2.2 (0.45)	2.0 (0.50)	1.9 (0.53)	1.6 (0.63)	1.0 (1.0)	0.70 (1.4)

Table 1: Development of heat transfer coefficients (U, W/m².K) and thermal resistances (R - m².K/W) for new residential buildings.

Building element	Normative U-value, W/m ² .K			
	Class B	Class A	Class A ⁺	Class A ⁺⁺
Roofs	0.16	0.10 κ	0.10 κ	0.080 κ
Floorings in contact with outdoor air				
Building elements in contact with ground	0.25	0.14 κ	0.14 κ	0.10 κ
Floorings over unheated basements and crawls				
External walls	0.20	0.12 κ	0.13 κ	0.10 κ
Windows and transparent building elements	1.6	1.0 κ	1.0 κ	0.70 κ
Doors and gates	1.6	1.0 κ	1.0 κ	0.70 κ

Table 2: STR 2.01.09:2012 normative requirements for thermal insulation of residential building envelopes.

Where $\kappa = 20/(\theta_i - \theta_e)$, is the temperature correction factor, with θ_i the indoor air temperature in °C, and θ_e the outdoor air temperature or design temperature of adjacent spaces in °C. The temperature of unheated spaces is determined separately. If the indoor air temperature $\theta_i = 20$ °C and the outdoor air is $\theta_e = 0$ °C, then $\kappa = 1$.

Table 3:
Overall U-factor
 $U_{(A)}$ ($W/m^2.K$) values
for calculation of
specific heat losses of
energy performance
class A buildings
according to
STR 2.01.09:2012.

Building envelope elements	Residential buildings	Non-residential buildings	
		Public buildings*	Industrial buildings**
Roofs	0.10	0.11	0.16 κ
Building envelope elements in contact with ground	0.14	0.16	0.25 κ
Floorings over unheated basements and crawls			
External walls	0.12	0.15	0.20 κ
Windows and transparent building envelope elements	1.0	1.3	1.4 κ
Doors and gates	1.0	1.3	1.4 κ

*, ** Definitions provided through the Regulation on classification of buildings.

buildings of various purposes with energy performance class A, as presented in Table 3.

Existing buildings

New legal requirements for energy performance for existing buildings after major renovation are established in Regulation STR 2.01.09:2012. These requirements were implemented from 1 January 2014.

The requirements for existing single-family, multi-family, office and education buildings after major renovation on cost-optimal levels are also based on the 'financial perspective' calculation using a real discount rate of 3% (based on calculations from 720 cases).

According to the results of the calculation, from 1 January 2014 the difference between the cost-optimal level of existing buildings and normative requirements varies approximately from -4.8% to -13%. Thus, the requirements for cost-optimal levels of minimum energy performance conform to the requirements for buildings of class C. A one-year transitional period was set up to achieve allowable limits: the energy performance class of renovated buildings and/or building units must not be lower than D when the permit for construction works was granted before 1 January 2014, and it must not be lower than C for permits granted after 1 January 2014.

I.iv. Action plan for progression towards Nearly Zero-Energy Buildings (NZEBs)

National application of the NZEB definition

The main purpose of the prepared national plan was to describe the key steps to increase the number of high energy performance buildings and NZEBs in Lithuania. The national plan was not adopted as a separate document but consists of important parts of several legal acts.

First, the new calculation methodology according to the EPBD requirements was prepared and came into force in February 2012. The calculation software tool was corrected according to the changes in the calculation methodology as well. The default data in the software tool's selection tables was enlarged accordingly. Classification was enhanced, introducing additional A⁺ and A⁺⁺ classes.

Based on the definition of NZEB that allowed the use of the existing classification system, the corresponding calculation methodology and software tools were set up in STR 2.01.09:2012: "*Nearly-Zero Energy Buildings - buildings which meet the requirements of the A⁺⁺ energy efficiency class; that is, buildings with a very high energy performance, where energy consumption is almost zero or very low; most of the energy consumed is covered by energy from Renewable Energy Sources (RES), including RES produced on-site or nearby*".

The total amount of renewable primary energy consumed in a building should be more than half of the primary energy consumed for the building's heating, cooling and ventilation systems. Regulation STR 2.01.09:2012 defines this requirement as in the formula in Box 1.

STR 2.01.09:2012 includes a plan with milestones, which was updated and made publicly available for contractors, investors and future owners:

- > From 2014 the energy performance class of new buildings or building units must not be lower than B;
- > From 2016 the energy performance class of new buildings or building units must not be lower than A;
- > From 2018 the energy performance class of new buildings or building units must not be lower than A⁺;
- > From 2021 the energy performance class of new buildings or building units must not be lower than A⁺⁺.

$$\frac{\text{The total amount of renewable primary energy consumed in building}}{\text{The amount of non - renewable primary energy consumed for heating + for cooling + for ventilation system's electric ventilators}} \geq 1$$

*Box 1:
Requirements for
NZEB as defined by
Building Technical
Regulation
STR 2.01.09:2012.*

Additional compulsory trainings of certification experts were planned and carried out, emphasising the need for dissemination of knowledge.

Cost-optimal levels were calculated for new and existing residential houses with one or two apartments, multi-story residential buildings, and educational and administrative buildings, according to the requirements of the Commission Delegated Regulation (EU) No. 244/2012 and Guidelines 2012/C 115/01. Determination of the cost-optimal level for NZEB was not the main purpose of these calculations, but the findings show that, in Lithuania, the same goals determined for NZEB could be achieved by using biofuel energy for heating and hot water. However, not every player in the construction market could use biofuel boilers, as the central heating system network has been installed and is still in use in many Lithuanian towns.

To determine cost-optimal levels suitable for all Lithuanian construction market players, only such facilities/selections/variants which could be used throughout Lithuania were evaluated.

According to the results of the calculations, it can be concluded that the total costs of construction and energy usage for NZEBs, based on the 2012 economic indicators, are much higher than cost-optimal levels.

Figures and statistics on existing NZEBs

By the end of 2014 approximately 90,700 EPCs had been issued in Lithuania. There are no buildings with A⁺⁺ energy performance class (in other words, NZEB), but there are 6 EPCs registered with A⁺ energy performance class and 29 EPCs with A energy performance class (by the end of 2014). All EPCs are collected in the central database and published on the website www.spssc.lt. The certificates for classes A, A⁺ and A⁺⁺ are published in a separate section of the website, for better visibility of high performance buildings.

I.v. Implementation of the Energy Efficiency Directive (EED) regarding building renovation and the exemplary role of public building

Deep renovations are specifically encouraged by the Energy Efficiency Directive (Directive 2012/27/EU - EED) through the requirement to establish

long-term strategies for the renovation of the national building stock covering all building types, including residential and non-residential buildings, whether in private or public ownership.

Regarding implementation of Article 4 of the EED, the long-term plan for the renovation of the national building stock was adopted on 10 March 2015 as part of the National Energy Efficiency Action Plan (NEEAP). The long-term plan covers all five subjects which are under the obligation of the EED: an overview of the national building stock, cost-effective approaches to renovation, policies and measures stimulating deep renovations, a forward-looking perspective to guide decisions of individuals and the construction industry, as well as expected energy savings and other benefits.

The targets of the long-term plan for 2020 are:

- 1) to renovate 3,500 - 4,000 multi-apartment buildings (9% - 11% of the multi-apartment building stock);
- 2) to renovate 700,000 m² of the building stock owned by the central government (5% - 6% of the central government building stock).

It has been calculated that after implementing these measures, 785 - 885 GWh of heating energy should be saved (based on calculations from 2013) or 199,000 - 225,000 tonnes of CO₂ equivalent.

The targets of the long-term plan for 2030 are:

- 1) to renovate more than 4,000 multi-apartment buildings (10% - 11% of the multi-apartment building stock);
- 2) to renovate no less than 800,000 m² of the building stock owned by the central government (6% - 7% of the central government building stock).

It has been calculated that after implementing these measures 228,000 tonnes of CO₂ equivalent will be saved.

Regarding implementation of Article 5 of the EED, the programme for improving energy efficiency in public buildings was adopted by the Government on 26 November 2014. The target of the programme is to improve energy efficiency in public buildings that are used for administrative, cultural,

educational, recreational, medical and other purposes. The programme briefly describes the situation of the existing buildings. According to information from the state enterprise Centre of Registers^[1], 13,123 public buildings which are owned by the government and municipalities were registered up to 1 January 2014. The total area of these buildings is 14,8 million m², which is around 35% of all buildings owned by the central government and municipalities. Around 5,500 of these buildings (5.9 million m²) are owned by the central government and 7,600 (8.9 million m²) by the municipalities. The majority of these buildings were built between 1900 and 1990. Currently, these buildings do not comply with the energy efficiency requirements, and around 2,300 GWh is used for heating in these buildings. Two major 2020 sub-targets are set in the programme: the renovation sub-target for public buildings owned by the government is 470,000 m² (for which the Ministry of Energy is responsible) and the renovation sub-target for public buildings owned by the municipalities is 230,000 m² (for which the Ministry of Environment is responsible). The primary yearly energy savings from these measures are calculated as 60 GWh and 14,000 tonnes of CO₂ equivalent will be saved by 2020. It is clearly stated that only the buildings which have an energy performance certificate with energy performance class below C can participate in this programme.

II. REQUIREMENTS FOR TECHNICAL BUILDING SYSTEMS (TBS)

II.i. Coverage of heating, domestic hot water, air-conditioning and large ventilation systems

The Building Technical Regulation STR 2.09.02:2005 “Heating, Cooling and Air Conditioning” is applied to design and construction of heating, hot water, AC and ventilation systems in buildings. All minimum requirements set for heating, cooling, hot water and ventilation systems are described in this regulation and are in line with the Regulation (EU) No 305/2011, and are mandatory for new, refurbished, replaced and upgraded Technical Building Systems (TBS).

The requirements lay down the basic principle that TBS must be designed in accordance with the intended use of the building, and they also contain the process requirements.

Systems must use a minimum amount of energy but reduction of indoor air quality is not acceptable as a means to save energy.

Building system characteristics must be calculated individually according to the energy performance requirements for the whole building or building unit.

Construction works and their heating, cooling, lighting and ventilation systems must be designed and built in such a way that the amount of energy they require should be lower than the legal requirements, taking into account its pattern of occupancy and of the climatic conditions of the location. All these systems, as parts of the building, must satisfy the basic requirements for construction works for an economically reasonable expected working life.

If there are special requirements for microclimate and air quality in buildings, the parameters for systems design are taken from hygienic, technological and normative regulations in the national legislation. When designing heating, ventilation and AC systems, the requirements for all parts of the building should be considered in the calculations: building location, thermal, airtightness, architectural and constructional characteristics, materials for structure and interior design, heat emission, moisture and pollution from occupants, equipment, etc., climate conditions and indoor air quality, as well as other factors and specific building purpose requirements.

II.ii. Applicability to new, replacement and upgraded systems in existing buildings

Since 2014, Lithuania has been applying updated system requirements for new, replaced and upgraded systems in existing buildings. They became stricter for buildings and building units and should be applied as they are technically, economically and functionally feasible (Table 4).

If a building has a mechanical AC system with recuperation system, energy efficiency requirements set out in regulation STR 2.01.09:2012 apply only to higher classes.

^[1] www.registrucentras.lt

System element	Other classes	Class A	Class A ⁺	Class A ⁺⁺
The efficiency coefficient of the recuperation system shall not be less than:	No requirements	0.65	0.80	0.90
The amount of energy used by the fans of the recuperation system shall not be higher than:	No requirements	0.75 Wh/m ³	0.55 Wh/m ³	0.45 Wh/m ³

*Table 4:
Minimum requirements for TBS for high-performing buildings.*

II.iii. Provisions for installation, dimensioning, adjustment and control

During the construction process, the designer is responsible for the entire process. It is not possible to recognise a building as fit for use without control of all systems in use in the building.

II.iv. Encouragement of intelligent metering

The Law on Heat Sector of the Republic of Lithuania requires measurements to be performed through one centrally installed heating meter for the whole building.

Implementing the EED Article 9, Part 3, which states that individual meters should be installed for end-users, Lithuania initiated a research study to clarify whether it is physically possible and economically feasible to install individual meters to all end-users. The study is planned to be finished at the end of February 2015.

II.v. Encouragement of active energy-saving control (automation, control and monitoring)

The Law on the Heat Sector (Article 33) states that the maximum rate of heat consumption in multi-apartment buildings must obey the following provisions:

1. The National Commission for Energy Control and Prices shall determine and, if necessary, change the maximum heat consumption rates for multi-apartment buildings and other spaces. These rates are published and available to the public. They are applied to multi-apartment buildings, which inefficiently consume energy and do not meet the minimum energy efficiency requirements. Government authorities determine whether a multi-apartment building consumes energy efficiently and/or if mandatory energy efficiency requirements are satisfied.
2. The municipal authority may impose more stringent maximum heat

consumption rates for multi-apartment buildings and other premises than the National Commission for Energy Control and Prices, if the saved expenses for heating costs after the implementation of energy efficiency measures cover consumers' investment costs for energy saving measures. Energy expenses for heating, which are saved after the implementation of energy efficiency measures, are determined in accordance with the procedures approved by the Ministry of Energy and the Ministry of the Environment.

3. The municipal authority has the right to oblige the owners of multi-apartment buildings, apartments and other premises which exceeded the maximum heat consumption rate to renovate the building's heating and/or hot water systems and/or perform other renovation/modernisation actions in accordance with the mandatory requirements within twenty-four months, as described in the Governmental procedures, and thus to ensure compliance with minimum energy performance requirements of multi-apartment buildings.
4. Owners of multi-apartment buildings and/or other premises have the right to use the support procedure established by the Government in the renovation/modernisation programme of multi-apartment buildings and other funds to implement the obligations of Part 3 of this article.
5. The Heat supply and consumption rules were approved by the Minister of Energy on 25 October 2010. They describe the installation and maintenance of heat meters, modernisation of heat substations, reconstruction of heat devices, installation and maintenance of hot water meters, reconstruction of hot water devices, building's heating and hot water systems' maintenance coverage and quality requirements, as well as other issues.

Pastatų energinio naudingumo sertifikatai

Duomenys atnaujinti: 2014-10-02. Pateiktos data: 2014-10-02.

Paisėška: [Visi laukai] [Ieškoti] [Rodyti visus]

Rasta įrašų: 01768 Puslapis: 1 iš 0177 Rodyti įrašų/psl.: 10

Sertifikatas Išdavimo data Galiojimo data	Unikalus Nr. Adresas	Pastato paskirtis	Energinio naudingumo klasė	Naudingasis plotas (m ²)	Energijos sąnaudos (kWh/m ² /metai)	Energijos sąnaudos šildymui (kWh/m ² /metai)*	Šilumos šaltinis	Vardas Pavardė	Atestatas	BS**
GR-0132-1754 2014-07-31 2024-07-31	1399-0034-6012 Vilniaus m. sav. S.Šilingo g. 34, Vilnius, Vilniaus m. sav.	Garabų, gamybos ir pramonės paskirties pastatai	A	1956	35	4	Šiluminis siurblys	Iona Kojelenė	0132	■
GV-0084-0103 2014-07-07 2024-07-07	4400-2581-1749 S.Šilingo g. 141B, Vilnius, Vilniaus m. sav.	Gyvenamosios paskirties vieno ir dviejų butų pastatai	A	103	46	19	Dujinis katilas, automatinis reguliavimas	Karolis Banionis	0084	□
GV-0084-0102 2014-07-07 2024-07-07	4400-2581-1805 S.Šilingo g. 141A, Vilnius, Vilniaus m. sav.	Gyvenamosios paskirties vieno ir dviejų butų pastatai	A	103	47	20	Dujinis katilas, automatinis reguliavimas	Karolis Banionis	0084	□
SN-0214-0281 2014-05-28 2024-05-28	4400-2978-7800 Verslo g. Nr. 11, Klaipėda, Klaipėdos m. sav.	Sandėlavimo paskirties pastatai	A	1741	53	47	Šilumos tinklai, automatinis reguliavimas	Rolandas Andrijauskas	0214	□
SN-0116-0091 2014-05-08 2024-05-08	4400-2941-7383 Ašlėnų g. 14, Kampiškiai k., Kauno r. sav.	Sandėlavimo paskirties pastatai	A	15824	35	28	Šiluminis siurblys	Audrus Bagdanavičius	0116	□
PR-0151-0142 2014-04-02 2024-04-02	4400-2346-0608 Pramonės pr. 4D, Kauno m., Kauno m. sav.	Prekybos paskirties pastatai	A	1598	41	4	Dujinis katilas, automatinis reguliavimas	Gintautas Grušauskas	0151	□
SN-0333-1561 2014-01-06 2024-01-06	4400-2817-8856 1B, Ukmergės r. sav., Jačionių k., Ukmergės r. sav.	Sandėlavimo paskirties pastatai	A	5161	31	24	Šiluminis siurblys	Robertas Varsimavičius	0333	□
MK-0005-0228 2012-12-19 2022-12-19	4400-2515-6447 Merkinės g. 2B, Alytus, Alytaus m. sav.	Mokalo paskirties pastatai	A	374	42	22	Šiluminis siurblys	Albinas Dobilas	0005	□
KG-0395-0029 2012-11-12 2022-11-12	4400-2212-9617 Bajonų kelias 5, Vilnius m, Vilniaus m. sav.	Kiti gyvenamosios paskirties pastatai (namai)	A	2305	60	17	Šilumos tinklai, automatinis reguliavimas	Ina Kichtenienė	0395	□
GV-0343-0002 2011-12-06 2021-12-06	4400-2054-4727 Žuviniųų 41, Vilnius, Vilniaus m. sav.	Gyvenamosios paskirties vieno ir dviejų butų pastatai	A	203	116		Šildymas elektra, automatinis reguliavimas	Milda Pruckuviene	0343	□

[1 2 3 4 5 6 7 8 9 10] Toliau : Pabaiga



(top) Figure 1: Central register of EPCs in Lithuania.

(above) Figure 2: Format of EPCs in Lithuania.

III. ENERGY PERFORMANCE CERTIFICATES (EPCs) REQUIREMENTS

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

Overview and administration system

All new buildings and building units must be certified after construction is completed, or when the buildings or building units are offered for sale or for rent. More than 90,700 EPCs were issued in Lithuania (at the end of 2014) since the system was implemented in January 2007.

In Lithuania all EPCs are collected in the central database and register. The database and register are continuously updated according to the requirements of the Building Technical Regulation. Every Qualified Expert (QE) has an obligation to send all issued EPCs to the central database.

More than 80% of registered certificates were issued since January 2013, after new requirements for certification of energy performance of buildings came into force. On average, 100 - 150 certificates are issued daily, i.e., about. 3,500 certificates monthly.

The central register is published on the website www.spsc.lt and can be used by related institutions, specialists and individuals (Figure 1). Since July 2014, all data were also transferred to the Real Estate Property Register and Cadastre.

How flats are certified in apartment buildings

For new multi-apartment buildings, an EPC is necessary for acceptance of a building as fit for use, so there is no need to certify separate apartments. The same applies to buildings after major renovation. In the case of sale or rent of existing buildings, it is possible to certify a separate apartment, if the whole building is not yet certified. For apartments in existing buildings, it is possible to issue a typical EPC without detailed calculations for the specific apartment.

Format and content of the EPC

The EPC of a building or building part must include the following data: a unique number of the building, address, purpose, useful area, energy performance class and estimated sum of energy inputs per m² of useful floor area of the building (primary and final energy), data on the main energy source and energy consumption for heating (primary and final energy), reference number of the EPC, date of issue and expiry date of the EPC, name, certificate number and signature of the expert who issued the EPC (Figures 2 and 3). Every EPC must also include detailed calculation results and recommendations for improvement.

EPC activity levels

By the end of 2014, 90,700 EPCs had been issued in Lithuania. Collection and registration of EPCs in the central database allows for quality control, statistical analysis and monitoring processes. Approximately 82,400 registered EPCs

Figure 3: Public building with energy performance class A.



concern residential buildings (including EPCs for apartments in multi-family houses) and 8,300 EPCs non-residential buildings (Figure 4). Of these, 29 EPCs were issued with energy performance class A, 6 EPCs with energy performance class A+, and no EPCs with energy performance class A++ (at the end of 2014). Most EPCs with high energy performance classes A and A+ were issued for residential buildings. The energy consumption for heating of these houses, according to registered EPCs, varies between 23 kWh/m².year and 25 kWh/m².year.

Typical EPC costs

In Lithuania there are no fixed or pre-defined prices for certification of energy performance of buildings. The EPC costs are regulated by the market and vary between 100 € and 5,000 € depending on type, location, complexity, size, construction details and many other factors of the building. For an EPC of an apartment in a multi-apartment building, the certification costs are approximately 100 €, and for a typical simplified EPC of an apartment in an existing building, with well-known typical poor energy performance and energy consumption, the certification costs are approximately 5 €. The certification costs of a simple single-family residence vary between 100 € and 270 €. The fixed registration fee for an EPC is 6 € and part of the fee is used to finance Quality Assurance (QA).

Assessor corps

The experts training programme, material for expert certification, rules, and procedures for experts and their responsibilities were updated in 2012 and 2014. The new training programme and methodical material for QEs were prepared and adopted by the Ministry of Environment. Expert training and certification organisations remain the same as designated in 2012.

Instead of 5 years validity, now the license of a QE is valid for an unlimited period, but the expert must undertake an additional 20 hours of training and pass an exam every 5 years. In Lithuania there are no requirements that a QE must issue a minimum number of EPCs.

The main qualification requirements for experts for building certification are the same for all types of buildings: an engineering diploma with 3 years of experience in construction, a special 32-hour training course and exam, practical experience of certification of 3 buildings. The Experts Training Programme

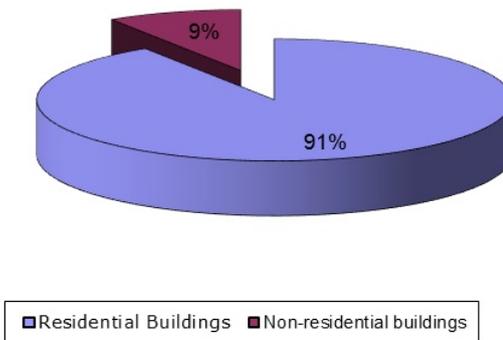


Figure 4: Certified residential and non-residential buildings (building units) in Lithuania 2007-2014 (status at the end of 2014).

and software tool were developed and adopted by the Minister of Environment in 2006 and updated in 2011, 2013 and 2014. In Lithuania there is an updated, publicly available database and official register of QEs. At the end of 2014, Lithuania had approximately 350 QEs with valid certificates for certification of energy performance of buildings, and about half of these QEs are actively working in the market. In Lithuania only a QE can issue an EPC and is responsible for an objective certification process (Figure 5).

Compliance levels by sector

For new buildings an EPC is necessary for acceptance of a building as fit for use and is always controlled by the commission of acceptance of buildings as fit for use. The same is applicable for buildings after major renovation. In the case of sale or rent of existing buildings, EPCs are carefully checked by a notary during the signing of real estate contracts.

That is why the number of EPCs significantly increased in January 2013, after new requirements for certification of energy performance of buildings came into force (Figure 6). Newly constructed buildings and buildings after major renovation cannot be accepted by the commission if the energy performance class, as evidenced by an EPC, is lower than required. That is why there is a 100%



Figure 5: Qualified Expert certificate.

Evolution of EPCs issued during the period of EPBD implementation 2007-2014 (status at the end of 2014)

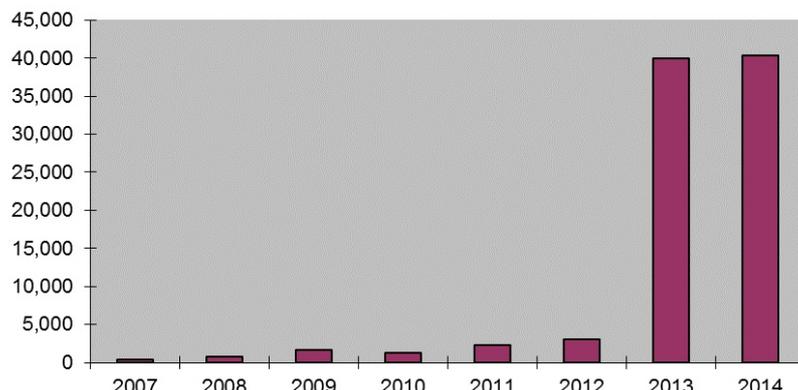


Figure 6: Evolution of EPCs issued in Lithuania 2007-2014.

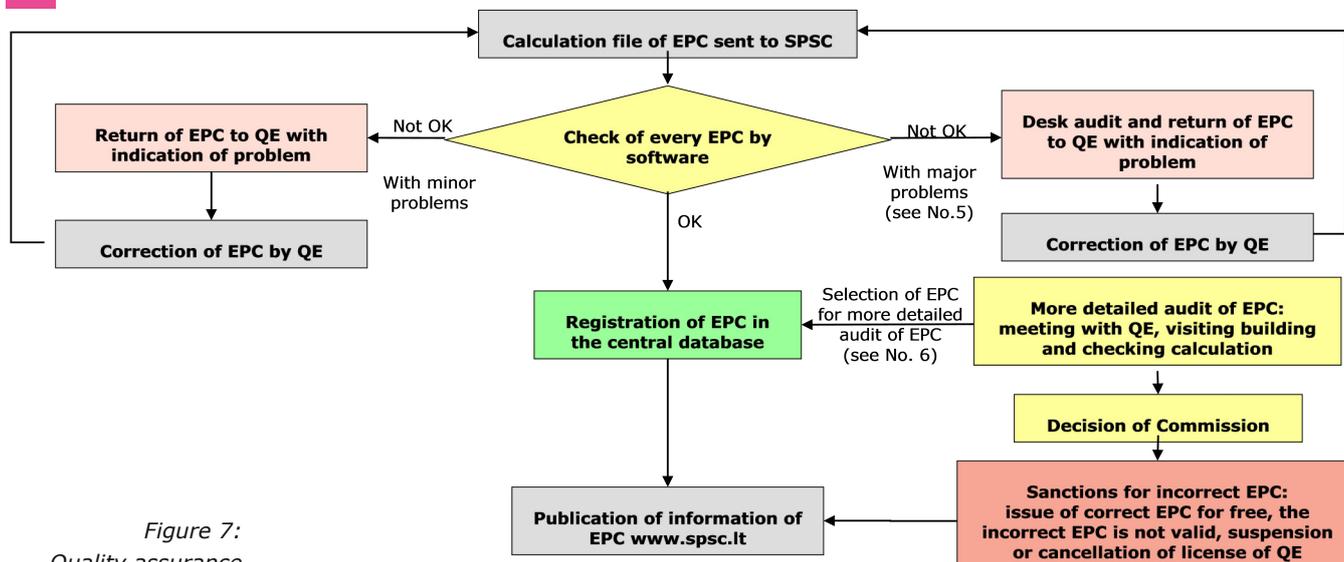


Figure 7:
Quality assurance
scheme in Lithuania.

compliance with the requirement to issue an EPC for every new building and every major renovation. In approximately 85% - 90% of the EPCs for existing buildings, the energy performance class is lower than required by the regulations.

Quality Assurance (QA) of EPCs

Lithuania has the same Quality Assurance (QA) system for different kinds of buildings. All EPCs have been collected in the central database and register since 2007/2009 (for new and existing buildings, respectively). The following details of every received EPC are checked by software: input data, calculation software version used, validation of QEs' certification and QEs' training.

EPCs are selected for a desk audit when the values are out of range, or when the EPC has a very high energy-performance class. A more detailed audit is required following client complaints, if the QE has submitted a number of EPCs that require correction, or at random according to the targeted percentage (not less than 0.5% of all issued EPCs).

Possible sanctions for incorrect EPCs include a warning, the obligation to issue a correct EPC for free, invalidation of the EPC, suspension of the QE's certification, or cancellation of the QE's certification. There are no financial or legal penalties

for incorrect and/or insufficient certification works for QEs.

In 2013, 39,955 EPCs were registered in Lithuania and 587 EPCs were returned to the QEs for correction due to mistakes and/or inaccuracies. Eight (8) EPCs were controlled through on-site detailed visits.

The QEs were informed and/or warned about mistakes and were asked to re-issue a correct EPC without charge.

This QA scheme is quite simple and effective (Figure 7).

III.ii. Progress and current status on public and large buildings visited by the public

Overview

According to the requirement of the Law on Construction of 9 January 2013 for buildings with a total useful floor area over 500 m² constructed for hotel, administrative, trade, services, catering, transportation, cultural, educational, healthcare or leisure purposes, occupied by the public and frequently visited by the public, energy performance certification is mandatory. An EPC, no older than 10 years, must be placed in the building in a prominent place clearly visible to the public (Figure 8).

Compliance with this requirement is controlled by the municipality that carries out supervision of building maintenance.

For new public buildings, as well as for existing buildings undergoing major renovation, an EPC is always controlled by the Commission of acceptance of buildings. Notaries also ensure there is an EPC during signing of real estate contracts for public buildings.

From 9 July 2015, the threshold of 500 m² will be lowered to 250 m².

Figure 8:
EPC on display in an
existing public
building.



Format and content of the EPC

In Lithuania, the EPC, the assessors, the costs and the quality control scheme for public buildings and large buildings visited by the public are the same as for residential and other non-residential buildings.

Activity levels

At the end of 2014, approximately 8,300 EPCs have been registered for non-residential buildings. Certification of energy performance of public buildings is mandatory in Lithuania. An average of 20% of the controlled buildings are public buildings.

III.iii. Implementation of mandatory advertising requirement

According to the Law on Construction in Lithuania of 9 January 2013, when existing and new buildings or building units are offered for sale or for rent, the energy performance indicator of the EPC of the building or building unit, as applicable, should be stated in the advertisements in commercial media.

At the moment there are no legal or financial penalties established or applied in Lithuania, and the control mechanism is not developed. The Ministry of Environment is responsible for the whole process and is seeking to influence property owners and real estate agencies through several publications and information campaigns.

Detailed official information, texts and tools are available on the national websites. Primary information and related legislation are already available on the national websites^[2].

III.iv. Information campaigns

The Lithuanian Housing Strategy was approved by the Lithuanian Government on 21 January 2004. One of the goals of this document is to ensure efficient use, maintenance and major renovation of the existing housing and efficient energy use. With the aim to accelerate the insulation of multi-apartment houses and the modernisation of their energy systems, the Programme for the Modernisation of Multi-apartment Houses was approved by Resolution No. 1213 of the Government of the Republic of Lithuania on 23 September 2004. It is being revised, envisaging additional financial and other measures aimed at encouraging apartment owners to renovate multi-apartment houses and involving low-

income population in the implementation of such projects.

The Public Company Housing Energy Efficiency Agency (BETA) gives special attention to publicity while developing multi-apartment building renovation (modernisation) programmes. The main goals of the publicity campaign are to encourage flat owners to join the programme, increase public awareness of the programme, ensure that information will be effectively provided to all target groups seeking to take an advantage of the programme's support, and develop positive public opinion about the programme. The primary target group are the final beneficiaries, being residents of apartments, chairmen of multi-apartment associations and administrators, as well as the programme administrators appointed by the municipality.

The secondary target group are associations related to the renovation process, local and national authorities, independent experts, opinion leaders and media, among others. The most important focus is on the final beneficiaries during this communication process.

The most important activities of the campaigns consist of organising:

- > seminars for residents, for project managers, for chairmen of multi-apartment associations, for investment planners, for engineers, for contracting companies, etc.;
- > an annual conference to summarise the results achieved during the year; the conference is organised by the municipal mayors and administrators of the projects that are being implemented;
- > 'Renovation days' in different cities of Lithuania; representatives of the Ministry of Environment and Housing Energy Efficiency Agency meet with residents and other participants in the renovation process in different cities.

Other activities include:

- > a free consultation line;
- > a temporary website for each activity;
- > printed hand-outs (leaflets and posters);
- > a detailed guide (handbook), describing all the steps in the entire renovation (for project managers);
- > a long-term media project on the most popular internet portal www.delfi.lt;
- > an intensive information campaign in regional media;
- > articles in national and specialised media.

^[2] www.am.lt, www.spsc.lt, www.betal.lt, www.enmin.lt

III.v. Coverage of the national building stock

More than 81,000 EPCs were issued in Lithuania since the system was implemented in January 2007.

There are more than 759,500 buildings with 1,075,000 building units in Lithuania at the end of 2014, and more than 38,000 multi-family buildings with more than 800,000 apartments in them. The classification of buildings according to intended use has been changed several times, so no clear data is available on how many buildings or building units should have an EPC. With existing data, the EPC coverage of the building stock cannot be calculated.

IV. INSPECTION REQUIREMENTS – HEATING AND AIR-CONDITIONING (AC) SYSTEMS

To implement Articles 15, 16, 18 and Annex II of the Directive 2010/31/EU for domestic heating systems and Air-Conditioning (AC) systems in buildings, the following orders were adopted:

1. The Lithuanian Minister of Energy and Minister of Economy approved on 10 December 2012 the Order No. 1-256/4-1205 “On the Approval of the Regulations” which describes compliance with the energy efficiency requirements of both heating and AC systems and the alternative measures for verification that are applied in Lithuania.
2. The Minister of Energy of the Republic of Lithuania approved on 26 March 2013 the Order No. 1-67 “On the Approval of Methodologies” which describes the inspection methodologies of both heating and AC systems applied in Lithuania.

Alternative measures are applied to all household customers, as well as other users, when:

- 1) the heating system is in operation with more than 20 kW but not more than 100 kW of rated power output;
- 2) the AC systems are in operation with more than 12 kW but not more than 100 kW of rated power output.

Alternative measures do not restrict opportunities for household customers and other users to choose the method of compliance verification established in Lithuania.

The Minister of Energy approved the Order No. 1-67 “On the Approval of Methodologies” on 26 March 2013, which describes the inspection methodologies of both heating and AC systems applied in Lithuania.

According to this regulation, heating and AC system inspections and the application of alternative measures are presented in Table 5.

IV.i. Progress and current status on heating systems

Overview, technical method and administration system

Compliance is checked using methodologies for heating and AC systems inspection approved by the Minister of Energy. These methodologies cover the measurement and estimation of the essential energy efficiency parameters of heating and AC systems. These parameters are determined to minimise the resources and costs needed for compliance inspection.

The operating parameters of the systems determine the energy efficiency of the systems' operation. These parameters

Table 5:
Map of application of inspections or alternative measures.

	Heating systems, rated output power		Air-Conditioning, rated output power	
	> 20 – 100 kW	> 100 kW	12 – 100 kW	> 100 kW
Household customers (HC)	Alternative measures are applied for all HC, though HC has the right to choose regular inspection. The inspections for HC are provided free of charge and the payment is made from the budgetary money.			
Other users (OU)	Alternative measures are applied for all OU. If OU is not applying these measures, it must do a regular inspection. If alternative measures are applied, OU has the right to additionally order a regular inspection. The payment for regular inspections is made by OU.	Regular inspections are applied for all OU. The payment is made by OU.	Alternative measures are applied for all OU. If OU is not applying these measures, it must do regular inspection. If alternative measures are applied, OU has the right to additionally order a regular inspection. The payment for regular inspections is made by OU.	Regular inspections are applied for all OU. The payment is made by OU.

should not be underperforming the parameters of the design values of the systems or economically-validated values of the other parts of the systems which determine the energy efficiency of the heating or AC systems (hereinafter - the limit values). The limit values are compared with the actual values of the operating parameters and in this way the weaknesses of the systems are determined and recommendations for improvement are suggested.

The limit values or references to regulations or technical documents where these values are described are given in the methodologies mentioned above. The limit values need to be consistent with the values that can be achieved following the manufacturer's recommendations and considering the heating system and boiler type or AC systems, the rated output power, the actual loading rate during the heating season, the operating conditions and the duration of the operation of systems, while following the requirements set out in the legislation of Lithuania.

The scheme that determines the frequency of heating system inspections for household, as well as for other users is presented in Table 6.

AC inspections for household customers, as well as for other users, are applied every third year, independently from the rated output power.

Based on this methodology, the inspection results are presented in the inspection reports. Two typical inspection reports are approved in this methodology - one for heating and another for AC systems. Two copies of each inspection report are made - one for the user, and another is kept in the inspectorate under the Ministry of Energy.

The inspectorate is responsible for organising and controlling the inspection of compliance of heating and AC systems in Lithuania. The Ministry of Energy controls the inspectorate, by approving a typical form which the inspectorate provides every year.

Arrangements for assurance, registration and promotion of competent persons

The inspectors who perform the inspection must be independent from the users, as well as from the designers of the systems or related components, manufacturers, assemblers, supervisors, power suppliers and other persons who may have an impact on their professional decisions.

Promotional activities

The information about regulations of inspections, inspectors' trainings and certification, registered inspectors, efficient fuel and energy consumption is publicly available on the website of the inspectorate. The inspectorate regularly reviews and renews this information.

Enforcement and penalties

The inspectorate is responsible for penalties for the inspections, and is planning to adopt a procedure for these penalties.

Quality control of inspection reports

Seven (7) physical and juridical persons and enterprises are qualified to inspect heating systems. Approximately 40 physical and juridical persons and enterprises are qualified to inspect AC systems.

The inspectorate issues certificates to operate energy systems and controls the activities described in the certificate. A total of 6,102 inspections of heating systems were carried out in 2013. Of these inspections, 4 heating systems were independently controlled.

Costs and benefits

Lithuania is planning to establish a fixed cost for an inspection in the near future. According to research undertaken in 2012 by the Lithuanian Energy Institute on the implementation of the EPBD, the costs for the inspection of heating systems may vary from 350 to 430 € depending on the power of the heating system, whereas for AC systems costs are calculated at approximately 345 €.

IV.ii. Report on equivalence

Alternative measures are applied for all household customers independently from the systems rated output power. Alternative measures do not restrict opportunities for all household customers to choose the compliance verification that has been established in Lithuania.

In 2012, the Lithuanian Energy Institute conducted research on the implementation of the EPBD, to compare the benefits of periodic inspections of

Table 6:
Inspection periods for
heating systems.

Heating systems, rated output power		
> 20 - 100 kW	> 100 kW	
Every fifth year	Gas fuel	Other fuel
		Every fourth year

heating and AC systems and alternative measures. The results of the research were used as a reference for the regulations.

In brief, the study reported that alternative measures - consultations and information campaigns for system users - can be equivalent to a regular inspection, if users have enough knowledge about their building or heating system at home. Natural gas or oil boilers installed in the heating systems of larger public buildings do not only have devices to measure fuel consumption, but often also devices to measure produced heat. The average thermal efficiency of such boilers can be easily calculated, providing information on making the balance between the consumed fuel energy and the produced heat. The alternative to such regular inspection of heating systems could be a mandatory requirement to measure the produced heat. In this case, monitoring the boiler's thermal efficiency can be undertaken by the supervision specialist, or even by the boiler operator himself, if he is appropriately trained. Such monitoring of the boiler's thermal efficiency is considered to be more effective than regular inspection every 2 to 4 years, which only gives a momentum thermal efficiency measurement, corresponding to a particular boiler operating mode during the routine inspection.

An alternative method could evaluate the actual annual average thermal efficiency of the boilers. Another reason to adopt an alternative method is that the heating systems are not technically adjusted for the required measurements. For example, necessary sampling holes for smoke analysis are not installed, and measurement devices which would be metrologically tested for recording system operating parameters are also not installed. In addition, during the regular system inspections, inspector's proposals to change or upgrade system's facilities or other parts come as recommendations, and therefore the building owner is not obliged to consider them.

The study also showed that inspection of heating systems equipped with less than 100 kW heating rated power pay off only if defects identified during the inspection are removed and recommendations are implemented (the heating system's efficiency would increase by at least 4.5%) while for wood-fuelled heating systems even more so (by no less than 10%). The inspection costs for AC systems with a cooling capacity from 12 to 100 kW pay off if efficiency is improved by at least

2.3% to 13%. Increased efficiency improvement is required for less powerful heating and AC systems. These results for heating and AC systems are unlikely, therefore alternative measures are chosen for these systems.

The inspectorate organises and controls the application of alternative measures to assess and improve the energy efficiency of heating and AC systems, the overall result of which should match regular compliance inspection. The system user decides on their own whether to follow the recommendations or not, as there is no enforcement. Among other things, the inspectorate evaluates the match between the overall results of alternative measures and results of regular inspections, and improves the alternative measures and/or creates new measures if the overall result from the alternative measures is not equivalent to the results from the regular inspections. Annual reports from the Inspectorate shall describe the actual achievements of the alternative measure, assess its overall results and show that they will at least match those of a regular inspection scheme.

Detailing of activities to improve energy performance of heating systems

The inspectorate provides regular consultations via telephone or internet.

Impact and equivalence assessment

The state enterprise Centre of Registers provides sufficient information on buildings, but insufficient information on boilers and replacement rates. Therefore, the inspectorate needs to gather information through a questionnaire which is publicly available on its website. So far, there has been very little public interest in filling in this questionnaire.

Costs and benefits

Alternative measures are carried out without costs. The costs are incorporated into the work done by the inspectorate, which is financed by the country's budget.

3. A success story in EPBD implementation

The main task of the Programme for the Modernisation of Multi-apartment Houses was to provide support to home-owners of multi-family buildings with the implementation of energy efficiency measures. The Programme began at the end of 2005.

The participants in the programme were apartment owners, the Housing Energy Saving Agency, municipalities, commercial banks, housing loans insurance companies, housing administration companies, engineering consultant companies (which prepare energy audits and investment proposals), contractors, etc.

The following are some of the measures funded by the programme to increase energy efficiency: replacement of windows, replacement of doors, insulation of ceilings/roofs, insulation of walls, installation of solar panels and wind mills, replacement of energy related equipment, replacement of elevators and electrical wiring in shared areas (stair wells, basements).

Therefore, the Lithuanian Government negotiated the establishment of the JESSICA Holding Fund to offer an attractive financing scheme to accelerate the major renovation process. Lithuania is one of the first countries in the European Union to use the JESSICA initiative for the improvement of energy efficiency in multi-apartment buildings. Originally, the fund size was projected at 227 M€ (127 M€ from the ERDF, as well as 100 M€ of the Lithuanian national budget). The overall aim of the JESSICA Fund is to contribute to increased energy efficiency in the housing sector by offering long term loan financing at preferential terms and conditions.

In 2010, a JESSICA financing mechanism was developed, by which the state will support about 30% of the rehabilitation project value from 2011 onwards: 100% support for technical documentation preparation and expenses for supervision of construction works if D class (according to the EPC classification) will be achieved, 15% support for energy efficiency measures implementation if D class (according to the EPC classification) will be achieved, and 100% support for low income families.

Beginning in 2013, the Lithuanian Government decided to accelerate the renovation process. Building upon the existing national programme for energy efficiency, a new model for renovation of multi-apartment buildings has been developed (the loan charge lies on the project administrator, the resident does not hold the financial burden).

In 2013, the additional incentive funded by the Special Climate Change Programme, to complement the JESSICA

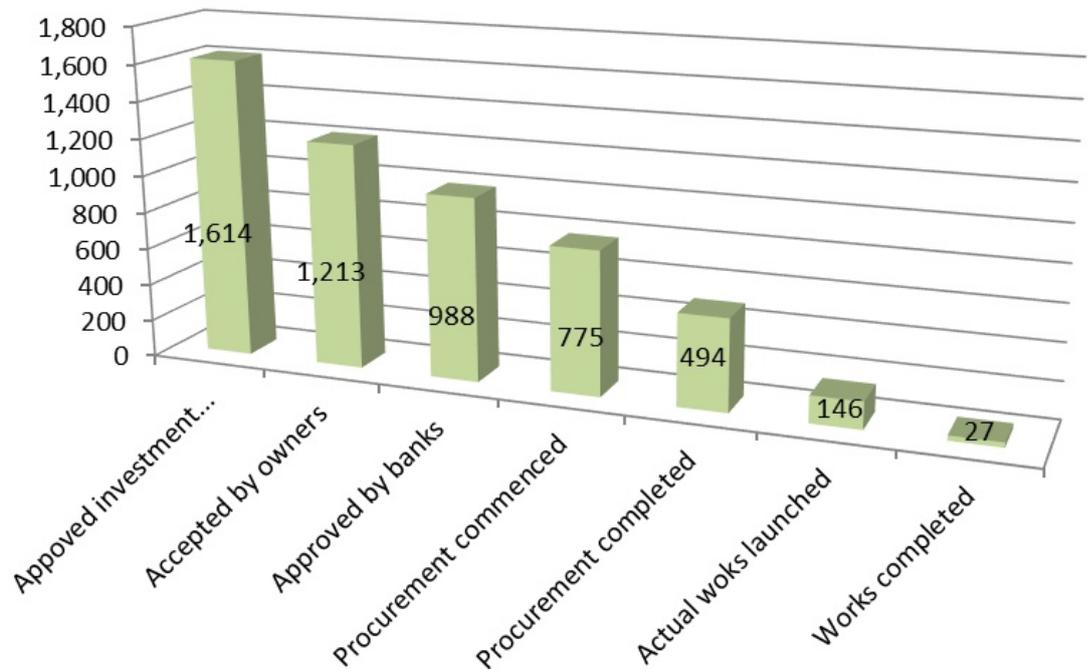
programme in the form of an additional 10% investment grant, was approved in case energy consumption is reduced by at least 40%. The total subsidy for renovation is 40%. In the context of the scheme, the state provides 100% of reimbursement for the loan repayment instalments for low-income families from its own budget and 100% reimbursement for the preparation and administration of paperwork. The JESSICA loan (maturity up to 20 years at a fixed annual interest rate of 3%) is offered to the owners of apartments or other premises in multi-apartment buildings, provided they commit themselves to implement energy efficiency measures and other measures set forth in the investment plan.

Renovation of each multi-flat building begins with the audit, calculation and issue of an EPC. The EPC is issued by attested certification experts using the calculation software tool, followed by recommendations to increase energy efficiency. Recommendations and EPC data are later used to draft the Investment Plan for renovation. Renovation of each multi-flat building ends up with the issue of a new EPC -to check whether the measures set out in the Investment Plan have been implemented and the planned performance actually achieved. Only an EPC with a positive evaluation allows for the final payments to be made, so energy efficiency certification and the EPC play a highly important role in the process of successful renovation.

The average price for multi-apartment building renovation is 200,000 €. This usually includes extra insulation of the envelope -roof and walls, replacement of windows and entrance doors, heating system's modernisation and rebalancing, and installation of thermostatic valves. The value of signed contracts currently stands close to 150 M€, which makes up to 8.3% of return in the whole construction sector of the country in the last year (Figure 9).

The programme has already achieved significant results - approximately 700 multi-apartment buildings have begun the renovation process (during 2013-2014), which is about 40% more than in the previous period (2005-2012). Ninety thousand (90,000) individuals would benefit from improved living standards, with 87,500 MWh of energy saved per year.

Figure 9:
Progress of
renovation process
from 1 January 2013
from 6 June 2014.



4. Conclusions, future plans

The building sector has become one of the priority areas for Lithuania in trying to meet its ambitious climate and energy targets for 2020. Several legislative initiatives have been introduced for building renovation. One of them - the cost-optimal energy performance requirements - was introduced into national legislation and is used for new buildings as well as for renovation activities.

Calculation and design methods are well-developed and are being continuously upgraded, but there is still need for training of designers and building users and owners. The Ministry of Environment supports and promotes many private and public initiatives, e.g., passive house and renovation of multi-apartment buildings in the framework of different programmes, informal training of the workforce by suppliers of construction products and systems and others.

Stepping into the final phase - mandatory A performance class for new buildings - information campaigns and public discussions on all important aspects with all stakeholders have become more important and will be improved upon in the near future.

It is worth repeating that a publicly available national plan (STR 2.01.09:2012) was adopted by 2012, with a stepwise approach to arrive at Nearly Zero-Energy Buildings (NZEBS), increasing the required energy performance class for new and reconstructed buildings and buildings after major renovation. The plan is well-known by investors, contractors, owners and institutions.

A central database of Energy Performance Certificates (EPCs) is recently integrated with the real estate property cadastre and very informative public register.

Regarding inspections of heating and Air-Conditioning (AC) systems, Lithuania is planning to revise the system to make it easier to understand and implement.



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