

Title of the measure:	LV 12 Energy Performance of Buildings (Recast Directive 2010/31/EU) - minimum thermal insulation standards <i>(Minimālo energoefektivitātes prasību paaugstināšana jaunbūvēm un rekonstruējamām ēkām: Ēku norobežojošo konstrukciju siltumtehnikas standards)</i>
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General description

The particular measure is defined as the horizontal measure and the description is included in both Household and Tertiary sector of MURE database.

Latvia's 2nd EEAP [1] had envisaged raising of minimal energy efficiency (EE) requirements for new buildings and buildings under reconstruction. Target audiences – owners of buildings and building companies. It had been stated by the 2nd EEAP the re-cast of the minimum EE requirements for windows, buildings boundary constructions as well as for technical systems of the buildings. Responsible ministry for the implementation - Ministry of Economy, responsible authorities for the monitoring – Ministry of Economy and municipal Building Boards.

The Latvian Construction Standard LBN 002-01 “Thermotechnics of Building Envelopes” [2] came into force 1st January 2003; the latest Amendments, adopted in April 2014 [3], had introduced the requirements of the recast Directive 2010/31/EU on Energy Performance of Buildings. The new values are mandatory for the projects which have been developed starting from the 22th April 2014¹.

In 07 September 2013 it had been adopted the new version of the Construction Law [4]. After adoption of this new Law, the Cabinet of Ministers (Government) had substituted also the relevant Governmental Regulations. Thus, in 30 June 2015 the Government adopted the national Construction Standard LBN002-15 “Thermotechnics of Building Envelopes” [5], however these regulations, compared to the previous version, are not changed in point of fact².

The purpose of the given Construction Standard is to reduce final energy consumption in buildings by increasing their EE. The Standard determines the requirements for boundary thermotechnics for new buildings and buildings under renovation/reconstruction as well as for new heating premises to be installed in already built buildings, the temperature in which during the heating season is maintained at 8°C and higher. Energy efficient construction elements promoting EE and limiting CO₂ emissions shall be provided for in the building design and construction.

The Standard sets two types of values for heat penetrability coefficients for different building's construction elements (see Table 1). At first, the normative values are used in the building design when calculation of the heat loss coefficient for the building is performed. The calculated heat penetrability coefficients of built building may be higher than defined normative values however shall not exceed the defined maximum values.

¹ the construction projects which had been accepted or submitted in Building Boards up to 22th April 2014 and the construction projects which are made according the planning and architecture tasks issued up to 22th April 2014 should not be re-designed according 2014 Standard requirements.

² Only the new Section 3.2 is introduced by these 30th June 2015 Regulations, see the following Table 1.



Table 1. Normative and Maximum Values of Heat Transmittance Coefficients for the Construction Elements $U_{RN}W/(m^2 \times K)$ and for the Linear Thermal Bridge Ψ_{RN} , $W/(m \times K)$, in force from 22.04.2014 [5].

No.	Construction elements	Residential houses, homes for the elderly, hospitals and kindergartens	Public buildings, except homes for the elderly, hospitals and kindergartens	Industrial buildings
1.	Roofs and coverings which are in contact with outdoor air	normative 0.15 * k maximum 0.20 * k	normative 0.20 *k maximum 0.25 * k	normative 0.25* k maximum 0.35*k
2.	Floors on the ground	normative 0.15* k maximum 0.20 * k	normative 0.20* k maximum 0.25 * k	normative 0.30* k maximum 0.40 * k
3.1	Walls	normative 0.18 * k maximum 0.23 * k	normative 0.20 * k maximum 0.25 * k	normative 0.25 * k maximum 0.30 * k
3.2	Walls of traditional log buildings without heat insulation layer in the wall (only maximum normatives) ^{see note}	maximum 0.65*k	maximum 0.65*k	maximum 0.30*k
4.1	Windows, balcony doors, other glazed constructions	normative 1.30 * k maximum 1.80 * k	normative 1.40 * k maximum 1.80 * k	normative 1.60 * k maximum 1.80 * k
4.2	Outer doors	normative 1.80 *k maximum 2.30 * k	normative 2.00 *k maximum 2.50 * k	normative 2.20 * k maximum 2.70 * k
5.	Thermal bridges R, Ψ_{RN}	normative 0,10 * k maximum 0.15 * k	normative 0.15 *k maximum 0.20 * k	normative 0.30 *k maximum 0.35 * k
<p><u>Note:</u> k – the temperature factor, the coefficient is calculated according the formulae $k = 19/(T_i - T_{oe})$, where T_i - the in-door temperature (°C), depending on use of building, T_{oe} - the average out-door temperature (°C) during the heating season in conformity with the Latvian Construction Standard 003-15 „Construction Climatology”, or the temperature in the next room, if the calculation of a construction element between two adjacent premises is performed. The values of k are presented in the Annex’s Table 8 of the noted Regulations [5]. As example, in case of 19°C in-door temperature, the values of k varies in the range 0.90 (average out-door temperature minus 2.0°C) up to 1.06 (average out-door temperature plus 1.0°C) <u>Note:</u> The section 3.2 is introduced by the 30 June 2015 Regulations [5].</p>				

Impact evaluation (methods and results)

The method of impact evaluation by Latvia’s 2nd EEAP – “top-down” [1]. It is planned by Latvia’s 2nd EEAP [1] to have specific energy saving of 20kWh/1m² for new and reconstructed buildings. The total volume of annually build/reconstructed area was anticipated 1.5 million m² (both residential and commercial sectors). Based on these data the annual energy savings of 30 GWh (0.108 PJ) were calculated (both residential buildings and tertiary sector buildings) by 2nd EEAP [1]:

- planned energy savings, year 2016 - 150 GWh (0.54 PJ);
- impact on energy savings, year 2020 - 270 GWh (0.972 PJ)

However, the 2nd NEEAP had planned the new regulations starting from 01.06.2012. In reality there is 2 years delay, namely, new regulations had been adopted only April 2014. Taking into account this delay, the given above figures might be recalculated as follows:



- planned energy savings, year 2016 - 90 GWh (0.324 PJ);
- impact on energy savings, year 2020 - 210 GWh (0.756 PJ).

In practice, the impact depends on the complex package of interacting measures, including both Construction standard, Energy certification of non-residential buildings, Financial instruments/measures for energy efficient renovation of buildings.

The sector of public buildings in Latvia has huge potential for energy savings. By the ownership status, 7141 buildings (both state administration and municipalities owned) with the total area 9.628 million m² are registered (Table 7 of [6]).

In the EU Funds programming period 2014-2020 there is planned total amount of financial support by ERDF and national budget ~ of 170.4 MEUR, of which 115.1 MEUR for EE renovation of State public buildings and 55.3 MEUR for EE renovation of municipal public buildings. According estimates of [8], investing this sum will result in at least renovation of 1.086 Mm² area of public buildings. One can see, the given ERDF co-financed programmes will provide renovation of at least 11.3% of the total area of the Latvia public buildings. [8] estimates improvement of EE for this total area at least 40 kWh/1 m², thus it should result in annual final energy savings of ~ 43.45 GWh (~ 0.156 PJ) in year 2023.

The envisaged savings in tertiary sector may be higher due to additional savings will be reached by investing private investments, not accounted above.

The total final energy consumption in Latvia tertiary (public and commercial, in total) sector constitutes ~ 25.65 PJ [9, average for years 2012-2014]. Thus the impact of the improvement of values of Construction Standard is high.

Interaction of measures

In 2013 it had been introduced by the new Governmental Regulations [10] six (A-F) energy efficiency classes of non-residential buildings (see the Table 1 in the MURE Tertiary sector measure TER-LV15 “Energy Certification of Non-Residential Buildings”). The “F” class (more than 150 kWh/1m² annually for heating³) is stated as energy efficiency requirements’ non-corresponding class in which EE improvement measures shall be implemented.

The financial support for energy efficient renovation of public buildings is planned in the 2014-2020 EU Structural Funds programming period, see the MURE database Tertiary sector measures:

- TER-LV16 “Increasing Energy Efficiency in State (Central Government) Public Buildings : EU Programming Period of 2014-2020”, and
- TER-LV17 “Increasing Energy Efficiency in Municipal Buildings: EU Programming Period of 2014-2020”

The EE investments in public buildings in 2014-2020 financial programming period are supplemented with the investments to improve efficiency of district heating systems, foreseen by the [7, sections 334-345].

Historical data

Table 2 presents development of the normative requirements for thermotechnics of building envelopes for the year 1979-2013.

³ for the buildings which have rooms of 3.5 meters high, the value is recalculated.



Table 2. Normative Values of Heat Transmittance Coefficients for the Construction Elements of Residential Houses Related to Specific Energy Consumption (according to the Table 11 of [6]).

Construction Elements		1980	1992	2003-2013
Roofs and coverings which are in contact with outdoor air	$W/$ ($m^2 \cdot K$)	0.90	0.25 – 0.40	0.2 k
Floors on the ground		-	0.5	0.25 k
Walls at weights less than 100 kg/m ²		1.1	0.33 – 0.50	0.25 k
Walls at weights 100 kg/m ² and over				0.3 k
Windows, doors		2.4	1.9 – 2.4	1.8 k
Thermal bridges		-	-	0.2 k
Specific annual energy consumption for heating	kWh/m ² annually	150 – 200	100 – 130	70 – 90

References

- Second National Energy Efficiency Action Plan of Latvia 2011-2013, <http://ec.europa.eu/energy/node/84> (see: Second NEEAPs translated into English)
- Cabinet of Ministers (Governmental) Regulations No 495 „Regulations Regarding Latvian Construction Standard LBN 002-01 “Thermotechnics of Building Envelopes” “ (*Ministru kabineta noteikumi Nr.495 "Noteikumi par Latvijas būvnormatīvu LBN 002-01 "Ēku norobežojošo konstrukciju siltumtehnika"*), adopted 27 November 2001, in force 01 January 2003 – 30 June 2015. published in Latvian: “Latvijas Vēstnesis” 174 (2561), 30.11.2001. Amendments adopted (i) 27 July 2004 (Governmental Regulations No621), (ii) 26 September 2006 (Governmental Regulations No791), (iii) 23 November 2010 (Governmental Regulations No1064), (iv) 08 April 2014 (Governmental Regulations No189). Historical consolidated version in Latvian: <http://www.likumi.lv/doc.php?id=56049> .
- Cabinet of Ministers (Governmental) Regulations No. 189 „Amendments to the Cabinet of Ministers Regulations No495 Regarding Latvian Construction Standard LBN 002-01 “Thermotechnics of Building Envelopes”„, (*Ministru kabineta noteikumi Nr.189 "Grozījumi Ministru kabineta 2001.gada 27.novembra noteikumos Nr.495 "Noteikumi par Latvijas būvnormatīvu LBN 002-01 "Ēku norobežojošo konstrukciju siltumtehnika"")*), adopted 08 April 2014, in force 22 April 2014 -, 30 June 2015 published in Latvian: „Latvijas Vēstnesis”, 77 (5137), 17.04.2014, <http://likumi.lv/doc.php?id=265703>
- Construction Law. Adopted 09 September, in force 01 October 2014, published in Latvian: „Latvijas Vēstnesis”, 146 (4952), 30.07.2015; amendments adopted 23 January 2014, 24 April 2014, 03 July 2014, 18 June 2015, 17 December 2015, 31 November 2016 and 22 June 2017. Actual consolidated version in Latvian: <http://likumi.lv/doc.php?id=258572> , English translation (amendments up to 3rd July 2014 included) http://likumi.lv/saistitie.php?id=258572&saistitie_id=7 .
- Cabinet of Ministers (Governmental) Regulations No339 „Regulations Regarding Latvian Construction Standard LBN 002-15 “Thermotechnics of Building Envelopes” (*Ministru kabineta noteikumi Nr.339 "Noteikumi par Latvijas būvnormatīvu LBN 002-15 "Ēku norobežojošo konstrukciju siltumtehnika"")*), adopted 30 June 2015, in force 01 July 2015: a) Regulations, b) Annotation (*anotācija*), published in Latvian: „Latvijas Vēstnesis”, 125 (5443), 30.06.2015, <http://www.likumi.lv/doc.php?id=275015> .
- Ministry of Economics. Long-Term Strategy for Building Renovation. http://ec.europa.eu/energy/sites/ener/files/documents/2014_article4_en_latvia.pdf
- Operational Programme “Growth and Employment”. Ministry of Finance of the Republic of Latvia, 2015. http://www.esfondi.lv/upload/14-20_gads/Planosana/fmdp_03052016.pdf (in Latvian); English translation: http://www.esfondi.lv/upload/Planosana/FMProg_270115_OP_ENG_2.pdf
- Output indicator passports of specific measures of the Operational Programmes “Growth and Employment 2014-2020 (Darbības programmas “Izaugsme un nodarbinātība” rādītāju noteikšanas apraksti), published 03.05.2016, in Latvian, <http://www.esfondi.lv/planosanas-dokumenti>

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9. Central Statistical Bureau of Latvia. The Statistic Database ENG02 “Energy Balance”, http://data.csb.gov.lv/pxweb/en/vide/vide_ikgad_energetika/?tablelist=true&rxid=cdbc978c-22b0-416a-aacc-aa650d3e2ce0
10. Cabinet of Ministers (Governmental) Regulations No 383 „Regulations On Energy Certification of Buildings” (*Ministru Kabineta noteikumi Nr.383 „Par ēku energosertifikāciju”*), adopted 09 July 2013, in force 19 July 2013., published in “Latvijas Vēstnesis” 138 (4944), 18.07.2013. Amendments adopted 10 November 2015 (Cabinet of Ministers Regulations No643) and 13 December 2016 (Cabinet of Ministers Regulations No804). Actual consolidated version <http://likumi.lv/doc.php?id=258322>, in Latvian.
11. Ministry of Economics (2014). Information Report on the Progress towards the Indicative National Energy Efficiency Targets in 2014-2016 according to Directive 2012/27/EU On Energy Efficiency amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, 17 March 2014, viewed by the Government 26 May 2014, <http://ec.europa.eu/energy/node/84>

