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

in accordance with Article 9 of the Recast EPBD[1]

Slovenia

July 2014

[1]Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast)

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1. Introduction

Recast Directive 2010/31/EU on the energy performance of buildings (Energy Performance Directive – Recast EPBD) lays down that buildings constructed after 31 December 2020 that use energy for heating and/or cooling for their operation shall be nearly zero-energy buildings. This requirement shall begin to apply to non-residential buildings owned or leased by public authorities two years earlier.

Under the Recast EPBD, Member States must ensure that:

(a) all new buildings are nearly zero-energy by 31 December 2020;

(b) new buildings owned and used by public authorities are nearly zero-energy after 31 December 2018.

Member States must draw up national plans to increase the number of nearly zero-energy buildings. These national plans may include targets differentiated according to the category of building.

Member States shall furthermore, following the leading example of the public sector, develop policies and take measures such as the setting of targets in order to stimulate the transformation of buildings that are renovated into nearly zero-energy buildings.

The national plans shall include, *inter alia*, the following elements:

(a) detailed application in practice of the definition of nearly zero-energy buildings drawn up by Member States, reflecting their national, regional or local conditions, and including a numerical indicator of primary energy use expressed in kWh/m2 per year. Primary energy factors used for the determination of the primary energy use may be based on national or regional yearly average values and may take into account relevant European standards;

(b) intermediate targets for improving the energy performance of new buildings, by 2015, with a view to preparing the implementation of Article 9(1) of the Recast EPBD;

(c) information on the policies and financial or other measures adopted in the context of Article 9(1) and (2) of the Recast EPBD for the promotion of nearly zero-energy buildings, including details of national requirements and measures concerning the use of energy from renewable sources in new buildings and existing buildings undergoing major renovation in the context of Article 13(4) of Directive 2009/28/EC and Articles 6 and 7 of the Recast EPBD.

The new Energy Act EZ-1[2] (adopted in February 2014) has transposed the requirement of the Recast EPBD Directive on nearly zero-energy buildings into national legislation. Article 330 of the Act lays down that all new buildings must be nearly zero-energy, with due regard to the deadlines laid down in the Directive. Under the EZ-1, a 'nearly zero-energy building' means a building with very high energy-efficiency or very low quantities of energy needed for such

[2] Energy Act (EZ-1) UL RS, 17/14

buildings to function, where the energy needed is produced to a large degree from renewable energy sources at the actual location or nearby;

In the first half of 2014, Slovenia compiled an analysis of the cost-optimal levels of minimum energy performance requirements for buildings,[3] which lays the expert foundations for a technical definition of a nearly zero-energy building. It is envisaged that the technical definition of a nearly zero-energy building will be laid down in the updated technical regulation on the energy performance of buildings,[4] planned for 2015.

In light of the expert analysis conducted, we can rely in the meantime on the draft definition of a nearly zero-energy building and take it as the basis for compiling the national plan to increase the number of nearly zero-energy buildings.

A detailed plan of the detailed application in practice of the definition of nearly zero-energy buildings, intermediate targets by 2015 and the policies and financial or other measures for the promotion of nearly zero-energy buildings are based on current strategic documents which Slovenia has either already adopted or which are being produced at the same time as this national plan to increase the number of nearly zero-energy buildings.

- Energy Efficiency Action Plan 2008–2016 (AN-URE)
- Energy Efficiency Action Plan 2011–2016 (AN URE 2), approved proposal
- Renewable Energy Action Plan 2010–2020 (AN OVE)
- Operational Programme for the Implementation of Cohesion Policy 2014−2020, in preparation
- Long-Term Energy Balances up to 2030 and the Expert Foundations for Determining National Energy Targets (DB 2030), IJS-DP-11467, rev. 2,[5] March 2014.
- Operational Programme to Reduce Greenhouse Gas Emissions by 2020 with the Outlook to 2030, OP RGGE 2020, April 2014, final draft
- National Energy Efficiency Action Plan 2014–2020, (AN URE 2020), June 2014, draft (also includes the Long-Term Strategy for Mobilising Investments in Building Renovation)

[3] Cost-optimal levels of minimum energy performance requirements for buildings in Slovenia; Analysis of results, Ministry of Infrastructure and Spatial Planning, GI ZRMK, February 2014.

[4] Rules on Efficient Use of Energy in Buildings (PURES) **(UL RS 52/2010, 30 June 2010) and** Technical Guidelines TSG-1-004:2010 **(link), which lays down the accounting methodology for energy performance certificates.**

[5] Update of documents from 2011: Institut Jožef Stefan, CEU; ELEK d.o.o., IREET d.o.o., ELAPHE d.o.o., GI ZRMK d.o.o. et al: Long-Term Energy Balances of the Republic of Slovenia 2010−2030 – Part 1: Premises, IJS-DP-10548, ver. May 2011 and Institut Jožef Stefan, CEU; ELEK d.o.o., IREET d.o.o., ELAPHE d.o.o., GI ZRMK d.o.o. et al: Long-Term Energy Balances of the Republic of Slovenia 2010−2030 – Part 2: Results, IJS-DP-10581, ver. June 2011.

2. Definition of a nearly zero-energy building

1.1. Overview

In June 2010, pursuant to the Recast EPBD, Slovenia adopted the Rules on Efficient Use of Energy in Buildings (PURES 2010), which introduces the methodology for calculating the indicators of energy efficiency in buildings in accordance with the CEN EPBD standards or the SIST EN ISO 13790 standard, and lays down the minimum energy-efficiency requirements for new buildings and the major renovation of existing buildings; it also prescribes the minimum requirements relating to maintenance and technical improvements (prior to the end of the lifecycle of an individual element, system or sub-system of a building). PURES 2010 laid down requirements for all public buildings that were 10% more stringent.

One important new feature is the requirement for a share of renewables in overall end-use energy for the operation of (all) systems in buildings of at least 25%, which is deemed to have been met in the following cases as well:

- if the share of end-use energy for heating and cooling of the building and the preparation of hot water is obtained in one of the following ways:
    - at least 25% from solar radiation,
    - at least 30% from gaseous biomass,
    - at least 50% from solid biomass,
    - at least 70% from geothermal energy,
    - at least 50% from ambient heat,
    - at least 50% from high-efficiency CHP installations in compliance with the regulation governing support for electricity generated in high-efficiency co-generation of heat and electricity,
    - the building is supplied to at least 50% from a system of energy-efficient district heating or cooling;
- or if the heat required for heating is at least 30% lower than the limit value referred to in Article 7 of these Rules;
- or for single-apartment buildings: if solar collectors with a light surface of at least 6 m^2 and an annual yield of at least 500 kWh/(m^2a) have been installed.

PURES 2010 sets strict minimum requirements for thermal insulation of the envelope (opaque elements, windows and doors) and for the maximum permissible heat for the heating of a building, which together with the prescribed 25% of renewable sources in overall end-use energy for operation of the systems in the building and the technical requirements for the systems (gas condensing boilers, the required COP for heat pumps, the required efficiency of ventilation recovery systems, the compulsory preparation of sanitary hot water using renewable source systems), constitutes a key part of the minimum requirements for energy-efficient buildings, while the primary energy for heating and cooling is defined somewhat loosely, with stricter provisions envisaged as part of the updating of the Rules.

Minimum requirements for the construction of new buildings and the major renovation of buildings under PURES 2010, entry into force of which is envisaged from the beginning of 2015:

The maximum permissible annual heat for heating Q_{NH} of the building (from 31 December 2014), converted into a unit of conditioned surface area A_u or volume V_e of the building, may not exceed:

- for residential buildings: $Q_{NH}/A_u \leq 45 + 60\,f_0 - 4.4\,T_L$ (kWh/(m^{2}a))
- for non-residential buildings: $Q_{NH}/V_e \leq 0.32\,(45 + 60\,f_0 - 4.4\,T_L)$ (kWh/(m^{3}a))
- for public buildings -10%: $Q_{NH}/V_e \leq 0.29\,(45 + 60\,f_0 - 4.4\,T_L)$ (kWh/m^{3}a)

The maximum permitted annual requirement for cooling Q_{NC} of a residential building, converted into a unit of cooled building surface area A_u, may not exceed:
- for residential buildings: $Q_{NC}/A_u \leq 50$ kWh/(m^{2}a)

The maximum permitted annual primary energy for the operation of systems in a building Q_p, converted into a unit of heated building surface area A_u, may not exceed:
- for residential buildings: $Q_p/A_u = 200 + 1.1\,(60\,f_0 - 4.4\,T_L)$ kWh/(m^{2}a)

The maximum permitted values U_{max} for individual building elements of the thermal envelope of the building are given in Table 1.

The coefficient of the maximum permitted specific transmission heat losses through the surface of the thermal envelope of the building A, determined by the formula H'_T (W/m^{2}K) = H_T/A, may not exceed

$$H'_T \leq 0{,}28 + \frac{T_l}{300} + \frac{0{,}04}{f_0} + \frac{z}{4};$$

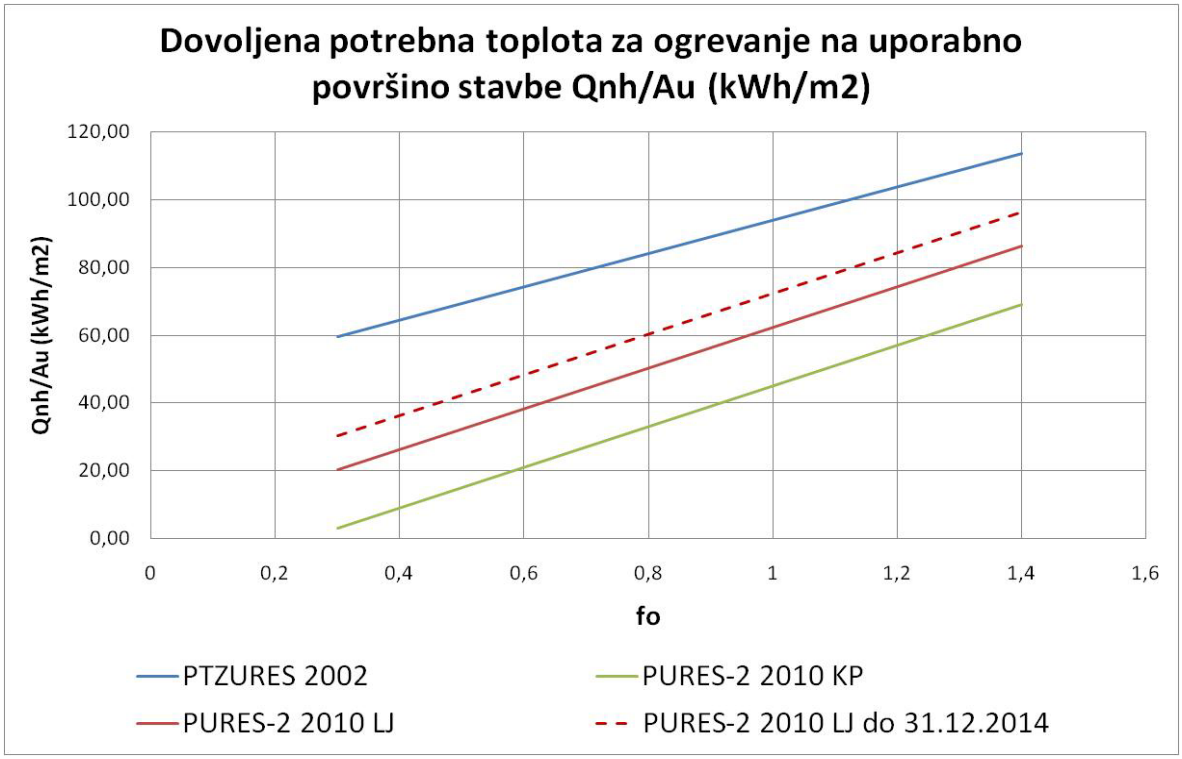
where T_l is the average annual air temperature (^{o}C) and with the proportion of glazed surfaces in the envelope (-).

Public buildings:
- The minimum requirements are 10% stricter for public buildings, i.e. 90% of the level of the general minimum requirements.

Table 1: The maximum permitted values U_{max} for individual building elements that abut onto heated areas

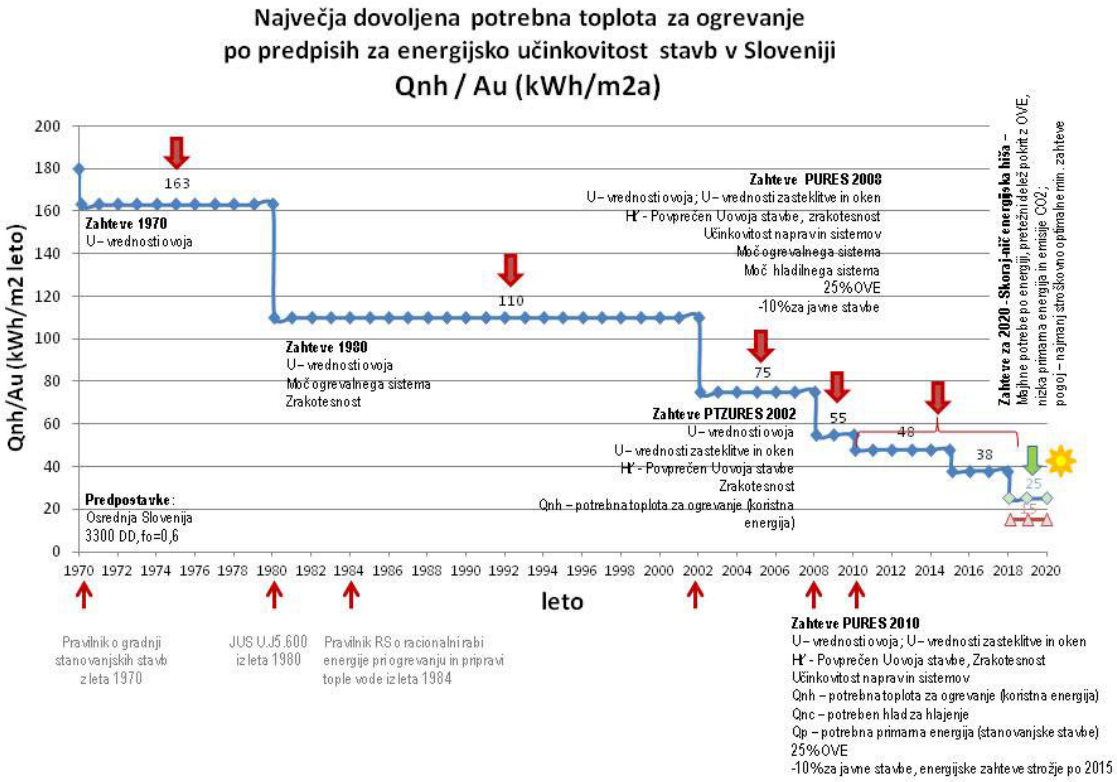
	Building elements that abut onto heated areas	**U_{max} (W/(m^{2}K))**

1	External walls and walls abutting onto unheated areas	0.28
2	External walls and walls abutting onto unheated areas – smaller areas that together do not exceed 10% of the surface area of the opaque part of the external wall	0.60
3	Walls that abut onto heated neighbouring buildings	0.50
4	Walls between apartments and walls that abut onto staircases, hallways and other less heated areas Internal walls and between-floor structures between the heated areas of different units and different users or owners in non-residential buildings	0.7 0.90
5	External wall of heated areas abutting onto the ground	0.35
6	Floor on the ground (does not apply to industrial buildings)	0.35
7	Floor above an unheated cellar, unheated area or a garage	0.35
8	Floor above ambient air	0.30
9	Floor abutting onto the ground and floor above an unheated cellar, unheated area or garage with panel/underfloor heating (tile heating)	0.30
10	Ceiling abutting onto an unheated area, ceilings making up flat or inclined roofs (flat or inclined roofs)	0.20
11	Smaller terraces that together do not exceed 5% of the surface area of the roof	0.60
12	Ceiling abutting onto the ground	0.35
13	Vertical windows or balcony doors and heated winter gardens with wooden or synthetic frames Vertical windows or balcony doors and heated winter gardens with steel frames	1.30 1.60
14	Roof windows, glazed roofs	1.40
15	Roof lights, dome skylights (up to a total of 5% of the surface area of the roof)	2.40
16	Entrance doors	1.60
17	Garage doors	2.00



Key: Permitted required heat for heating per useful floor area of a building. LJ do 31.12.2014 = Ljubljana up to 31 December 2014

Figure 1: Comparison between the maximum permitted required heat for heating a building under PURES 2010 (Ljubljana – climatic conditions in Ljubljana comparable with the majority of the conditions pertaining to the rest of Slovenia) and the stricter requirements entering into force from the beginning of 2015



Key: Maximum permitted required heat for heating under the regulations on the energy-efficiency of buildings in Slovenia.

Requirements 1970. Value for envelope.
Requirements PURES 2008. Value for envelope. Value for glazing and windows. Average value for building envelope, airtightness. Efficiency of installations and systems. Power of heating system. Power of cooling system. 25% renewable sources
10% for public buildings
Requirements 1980. Value for envelope. Power of heating system. Airtightness.
Requirements PTZURES 2002. Value for envelope. Value for glazing and windows. Average value for building envelope. Airtightness. Required heat for heating (useful energy).
Requirements 2020 – nearly zero-energy house. Low energy requirements, predominant share covered by renewable sources, low primary energy and CO2 emissions; condition – lowest cost-optimal minimum requirements.
Assumptions: Central Slovenia.
Rules on the Construction of Residential Buildings from 1970.
Rules of the Republic of Slovenia on the Efficient Use of Energy in Heating and Hot Water Preparation from 1984.
Requirements PURES 2010: Value for envelope. Value for glazing and windows. Average value for building envelope. Airtightness. Required heat for heating (useful energy). Required cooling for cooling. Required primary energy (residential buildings). 25% renewable sources. 10% for public buildings, stricter energy requirements after 2015.

Figure 2: Overview of the tightening of the prescribed minimum requirements for the energy performance of buildings in Slovenia and the increase in the complexity of the minimum requirements

The results of the analysis of the cost-optimal level of minimum requirements showed that the existing minimum requirements for new residential buildings prescribed by the PURES 2010 rules are stricter than the cost-optimal level; the reason for this lies in national energy and climate policy in the construction sector, which has, in buildings, identified large potentials for efficient energy use and the use of renewable energy sources at the building level. The same findings also ensue from the analysis of the cost-optimal levels of requirements for non-residential office buildings and the minimum requirements for the complete and partial renovation of family houses, multi-apartment buildings and non-residential (office) buildings.

It should be pointed out that the minimum requirement for primary energy as laid down in PURES 2010 is not strict enough in light of the results of the analysis of the cost-optimal level; however, owing to a series of partial minimum requirements for buildings and systems, this does not have a significant impact on the final energy-efficiency of buildings. Stricter minimum requirements for primary energy will be prescribed by means of a definition of a nearly zero-energy building.

All the analysed cases of buildings that comply with the national PURES 2010 have high

levels of thermal protection and energy-efficient windows such that the total transmission heat losses through the building envelope (H'_T) are below 0.4 W/m^2.K; moreover, the most advanced gas condensing boiler and solar collector technologies for the preparation of sanitary hot water, or other systems such as heat pumps or biomass boilers, are being utilised, leading to the prescribed share (now 25% of renewable energy sources in buildings).

1.2. Draft criteria for a nearly zero-energy building

The draft minimum technical requirements for a nearly zero-energy building envisage a tightening of the minimum requirements regarding the highest permitted heating, cooling or air-conditioning needs, the preparation of hot water, lighting within the building, and the growth in the headline share of renewable energy sources in total energy use for the operation of buildings.

If the maximum permitted heat for the heating of a building in the case of a family house with the proposed factor (envelope/volume) of 0.6 under the requirements of PURES 2010 (Figure 2) by the end of 2014 is limited to 48 kWh/m^{2}a and this restriction is reduced still further to 38 kWh/m^{2}a from the beginning of 2015, an additional reduction in the maximum required heat for the heating of a building is envisaged with the introduction of minimum requirements for a nearly zero-energy building:

- to 25 kWh/m^{2}a, where the restriction for primary energy may be met only by means of a considerably higher actual share of renewable energy sources (an envisaged increase from 25 to 50%) in the overall end-use energy for the operation of the systems in the building;
- to 15 kWh/m^{2}a, if the technical possibilities for the use of renewable energy sources at the building's location are insufficient.

The upper values are, as currently already prescribed in the applicable PURES 2010, being adjusted accordingly, taking into account the climatic characteristics at the building's location and the proposed building factor.

The following maximum permitted primary energy values are envisaged for a nearly zero-energy building under the study of the cost-optimal level of minimum requirements (draft submitted to the Expert Council for Efficient Energy Use at the ministry):

Table 2: Maximum permitted primary energy values in relation to individual building type (draft)

Building type	**Maximum permitted primary energy value (kWh/m2a)**	
	New building	**Major renovation (reconstruction)**
Family houses	50	90
Multi-apartment buildings	45	70
Non-residential buildings*	70	100

*Based on an analysis of the cost-optimal level for office buildings as the most strongly represented group of non-residential buildings.

The primary energy values will be achieved for a nearly zero-energy building by reducing the share of local renewable energy sources using the technologies outlined below.

District heating systems using wood biomass as the energy source within energy conversion systems with controlled emissions chiefly in urban and geographically unfavourable, densely populated areas effectively reduce primary energy use at the same as raising the level of local energy self-sufficiency in comparison with other forms of energy source. Co-generation or poly-generation systems are most appropriate owing to the transformation of wood biomass (potentially waste as well) into high-efficiency thermal energy with a local energy source, at the same time as increasing the share of renewable energy sources in the national electricity system without polluting the environment with solid particle and other emissions with a pronounced local impact, such as nitrogen and carbon dioxide. In exceptional cases, individual wood biomass boilers can make a significant contribution to reducing primary energy use in suburban and sparsely populated areas.

Regardless of the location, heat pumps that use a high share of renewable energy sources in their operations are suitable for reducing primary energy use for the heating of nearly zero-energy buildings. The heating figure or coefficient of performance (COP) and the share of renewable energy sources in the production of electricity in the national electricity industry both have a significant impact on the share of renewable energy sources used for the operation of heat pumps. In 2012 the share of renewable energy sources in electricity production in Slovenia was 31.4%, which means that a heat pump with a COP of 3.5 used 80.4% renewable energy sources and 19.6% non-renewable energy sources for its operation. This represents approx. 35% less primary energy for the same amount of heating than with comparable ELHO or gas systems. Achievement of the target in 2020 with a 39.3% share of renewable energy sources in the national electricity system means that the same heat pump will use 82.7% of its energy from renewable energy sources for its operation.

Some other systems that are more dependent on the natural fluctuation of weather conditions (solar energy collectors, solar power plants) may, in the case of own consumption in nearly zero-energy buildings, also be suitable for improving the primary energy balance, their value lying chiefly the accessibility of the technology, in economic and technical terms, to individuals, which can help to encourage sustainable ways of living.

Alongside final confirmation of the minimum requirements for a nearly zero-energy building, it is of crucial importance to ensure that the standard profiles of use of buildings are aligned with the emerging new generation of CEN EPBD standards, that the area of use of energy included in the determination of energy indicators is re-examined (the use of energy for lighting is also taken into account in residential buildings in Slovenia) and that a study is made of how to take renewable energy sources produced on/alongside or in the vicinity of a building into account in the calculation. Alongside confirmation of the technical definition of a nearly zero-energy building, it is also important to re-examine the conversion factors for the calculation of primary energy.

Table 3: Conversion factors for calculating the annual primary energy for individual types of energy source

Energy source	Conversion factor
heating oil	1.1
gas	1.1
coal	1.1
wood biomass	0.1
electricity	2.5
district heating without co-generation	1.2
district heating with co-generation	1.0

The indicator of specific CO2 emissions is calculated for buildings (Table 4) but is not restricted by regulation.

Table 4: Specific CO2* emissions for individual types of energy source

Energy source	Per unit of heating	Per energy unit
natural gas	1.9 kg/Sm^3	0.20 kg/kWh
liquefied petroleum gas	2.9 kg/kg	0.215 kg/kWh
extra-light heating oil	2.6 kg/l	0.265 kg/kWh
light heating oil	3.2 kg/kg	0.28 kg/kWh
district heating	0.33 kg/kWh	0.33 kg/kWh*
electricity	0.53 kg/kWh	0.53 kg/kWh
brown coal (domestic)	1.5 kg/kg	0.32 kg/kWh
brown coal (foreign)	1.88 kg/kg	0.40 kg/kWh
lignite (domestic)	1.0 kg/kg	0.33 kg/kWh

2. National building stock and potentials for a nearly zero-energy building

The Recast EPBD aims to promote the construction of nearly zero-energy buildings even before the final deadline for introducing requirements for new buildings.

To this end, the national plan defines the potentials for the construction of nearly zero-energy buildings:

- for new single-family houses
- for new multi-apartment buildings
- for new public buildings
- for other new non-residential buildings

and the potentials for the complete renovation of existing buildings:

- for single-family houses
- for multi-apartment buildings
- for public buildings
- for other non-residential buildings
- for central government public buildings (where a 3% annual complete renovation is required).

The potentials are determined by taking into account the dynamics of new buildings and the possibility of more advanced requirements for energy-efficiency and the use of renewable energy sources in the complete renovation of existing buildings. Nearly zero-energy renovation is a special challenge that can be met under special conditions: if the complete renovation of existing

building stock is planned, and if we have, for example, a predominantly unrenovated building in single ownership or with the approval of all co-owners, along with adequate (co-)financing of the project and incentives. The strict protection conditions applying to built heritage and a lack of knowledge and experience in the planning and implementation of more complex nearly zero-energy renovation projects can make complete advanced energy renovation difficult.

2.1. Structure of the existing national building stock

If we compare the useful floor area of the national building stock on the basis of the 2014 Property Register, we find that residential buildings, among them family houses, predominate, while office buildings are the largest sub-group within non-residential buildings.

Table 5: Useful floor area by individual group of the CC-SI single classification of buildings in Slovenia

CC-SI SINGLE CLASSIFICATION OF BUILDINGS		Useful floor area [1000 m^2]
CC-SI 111	Apartments in a building with one part of the building	45 351,71
CC-SI 112	Apartments in a building with two parts of the building	4 285.78
CC-SI 112	Apartments in a building with several parts of the building	17 001.45
CC-SI 113	Dwelling in a special-purpose building	1 001.06
CC-SI 121	Catering and hospitality buildings	2 748.10
CC-SI 122	Administrative and office buildings	6 728.44
CC-SI 123	Trade and other service activity buildings	5 960.63
CC-SI 124	Transport and electronic communications buildings	5 263.04
CC-SI 125	Industrial buildings and warehouses	19 400.33
CC-SI 126	Buildings of general social importance	7 265.34
CC-SI 127	Agricultural buildings, buildings for religious ceremonies, etc.	42 225.49
CC-SI 13	Joint use	267.44

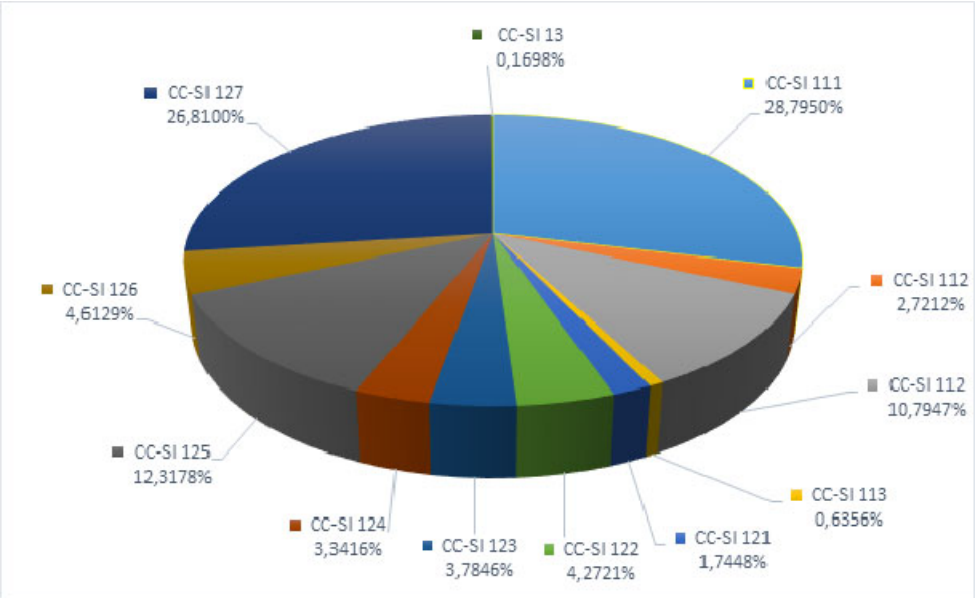
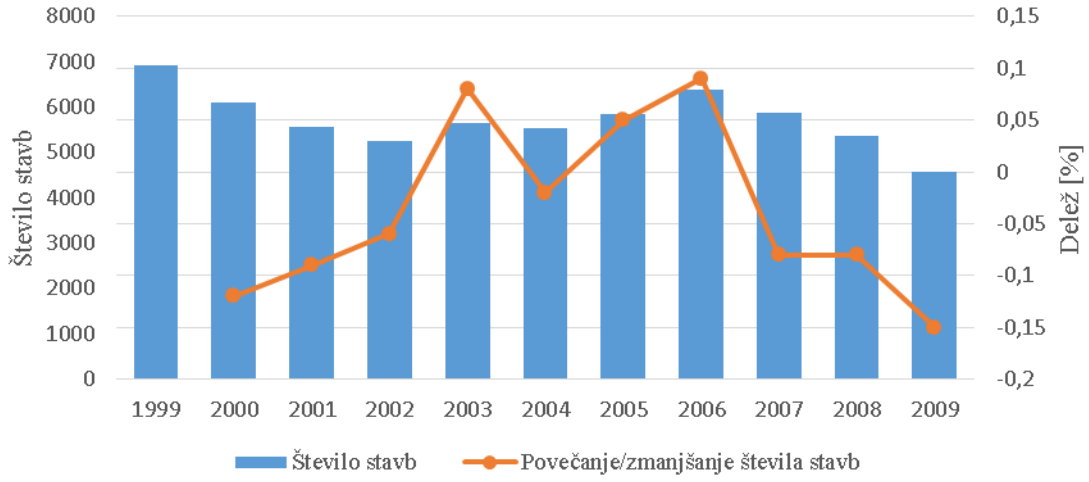


Figure 2a.Useful floor area by individual group of the CC-SI single classification of buildings in Slovenia

2.2. Timetable of new buildings

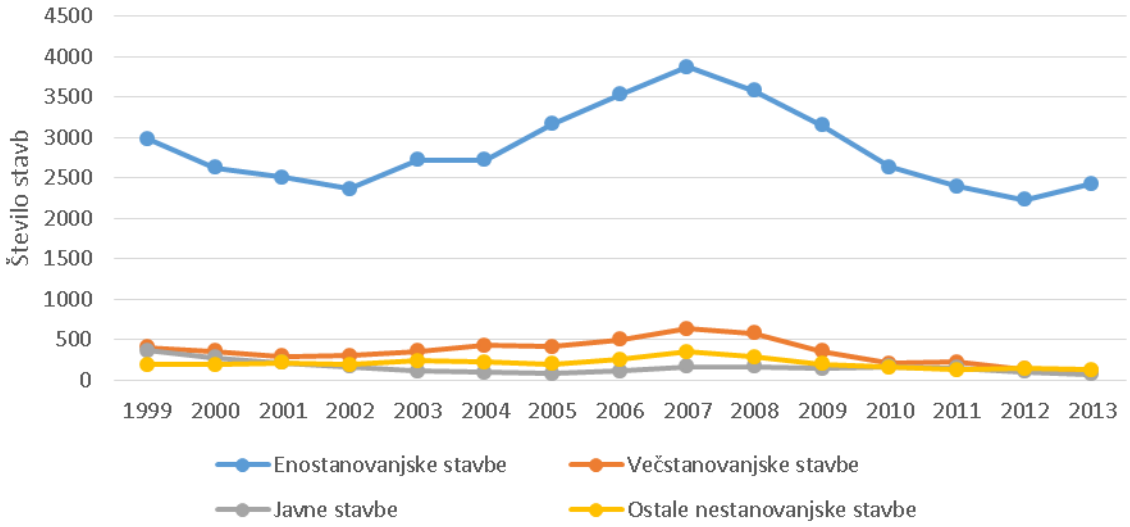
Between 1999 and 2009 over 63 000 building construction permits were issued in Slovenia covering over 27 million m^2. More than 43 000 of these permits were issued for the construction of residential buildings (almost 14 million m^2) and a little over 20 000 for the construction of non-residential buildings covering almost 13 million m^2.



Key: No of buildings, Increase/reduction in no of builings, Share (%)

Figure 3: Number of building construction permits issued and the difference in number compared to the previous year (source: SORS)

Between 1999 and 2013 over 53 000 construction permits for new buildings were issued in Slovenia covering almost 23 million m^2. More than 48 000 of these permits were issued for the construction of residential buildings (almost 16 million m^2) and a little over 5 000 for the construction of non-residential buildings covering almost 7 million m^2. The trend in the number of building permits issued annually shows the effect of the property crisis, with a pronounced fall since 2007.



Key: Single-apartment buildings. Multi-apartment buildings. Public buildings. Other non-residential buildings.

Figure 4: Number of new buildings for which building permits were issued (source: SORS)

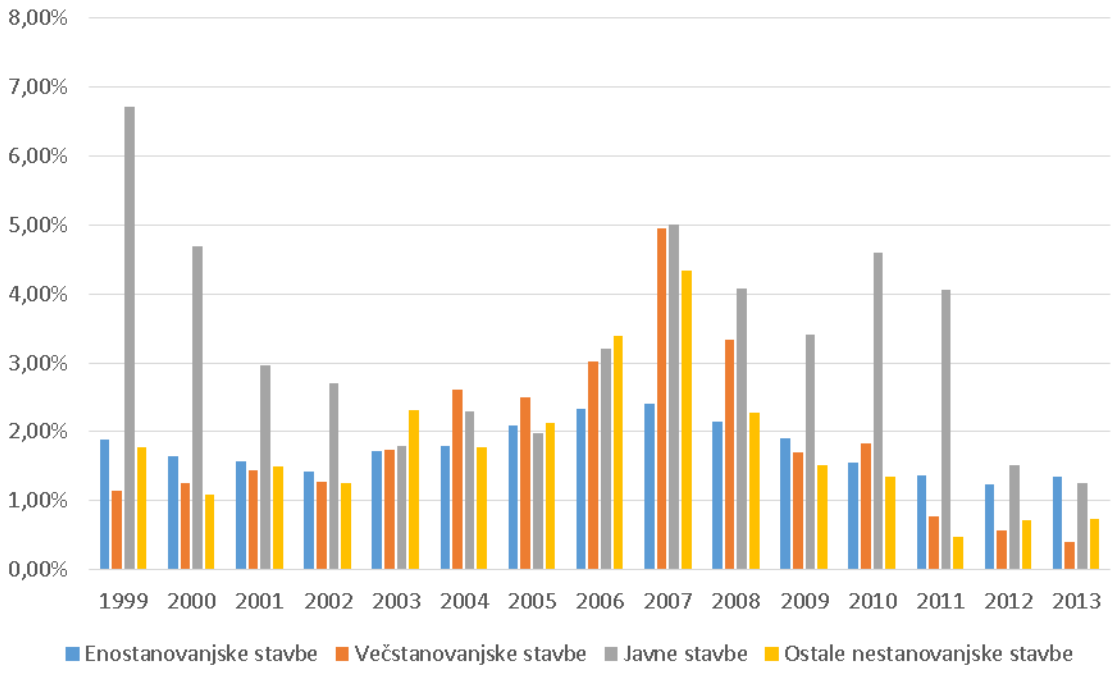
The highest number of building permits for the construction of new buildings was issued in 2007 – a little over 5 000. From that year onwards, the total number of permits issued fell between 8 and 10% up to 2012. However, in 2013 there was a rise of 5% in the number of permits issued relative to 2012.

Table 6: Number of new buildings for which building permits were issued, by building group (source: SORS)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Enostanovanjske stavbe	2988	2626	2512	2367	2723	2721	3167	3533	3877	3581	3155	2641	2397	2236	2430
Večstanovanjske stavbe	406	358	298	306	360	432	416	501	636	583	357	210	224	135	112
Javne stavbe	366	278	214	169	110	98	84	112	169	165	146	171	156	101	75
Ostale nestan. stavbe	193	190	220	196	240	221	200	253	351	285	198	159	127	143	125

Key: Single-apartment buildings. Multi-apartment buildings. Public buildings. Other non-residential buildings

An overview of the number of building permits for new buildings by building group shows that the biggest fall in the number of permits issued can be seen among multi-apartment buildings, with 40% fewer permits issued in 2010 and 2012 than in 2009 and 2011 respectively. After 2007, an average of 15% fewer permits were issued in the housing sector (13% fewer in the services sector).

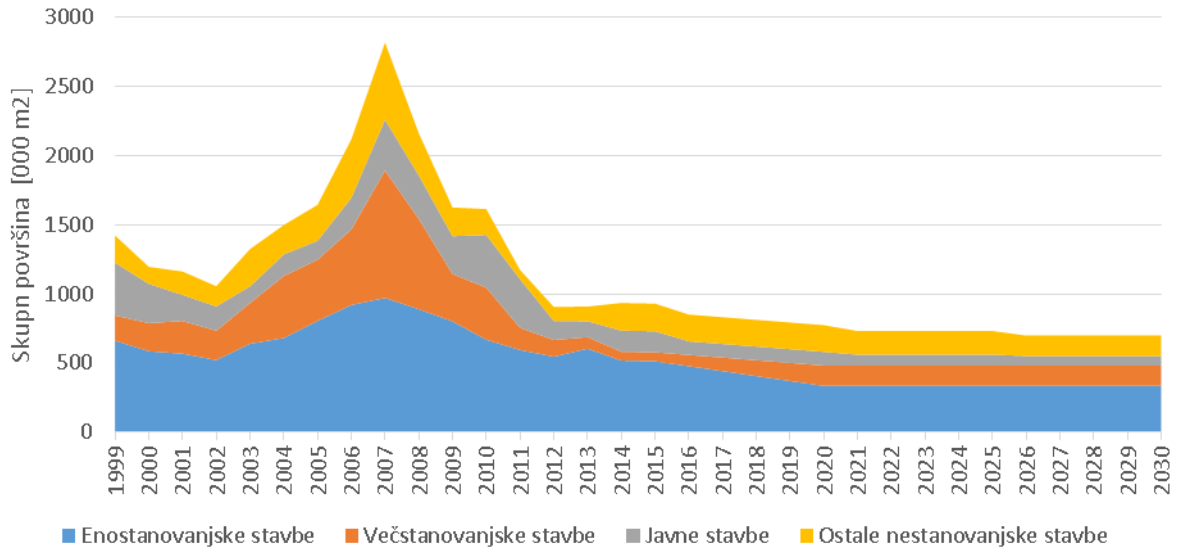


Key: Single-apartment buildings. Multi-apartment buildings. Public buildings. Other non-residential buildings

Figure 5: Proportion of new buildings in the period for which building permits were issued (SORS)

Figure 5 shows the structure of new buildings in relation to the individual building type in a specific calendar year.

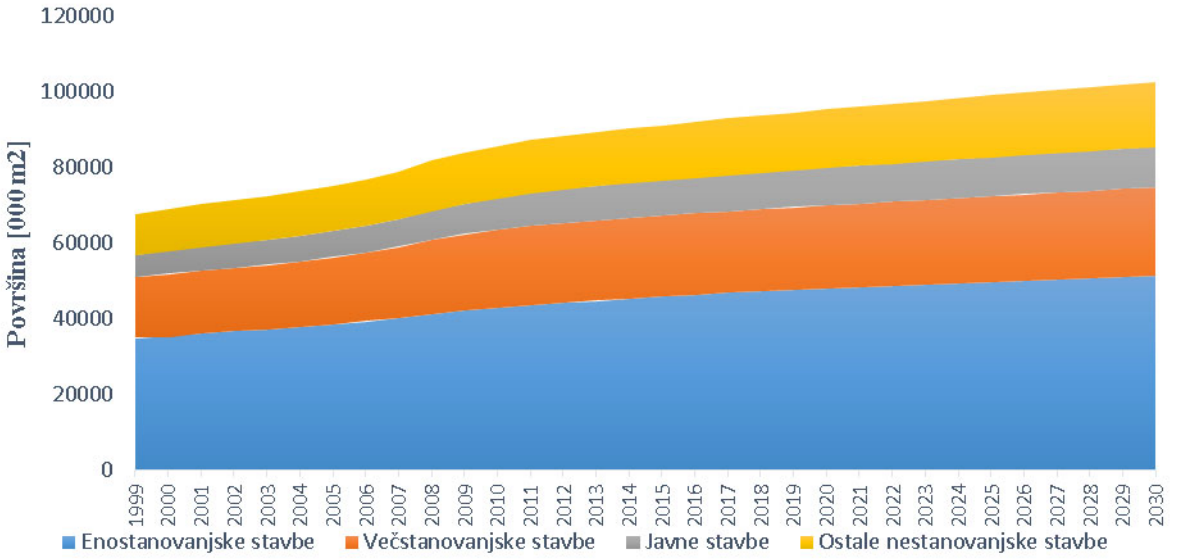
Based on the permits issued for the construction of new buildings from 1999 and the prognoses derived from the '*Long-term energy balance of Slovenia up to 2030 and the expert foundations for determining the national energy targets*', it is envisaged that the total cumulative floor area of new buildings will fall (Figure 6) by 2030. The floor area of finished apartments has reduced since 2008 on account of the economic crisis; this is particularly evident in multi-apartment buildings. The projection for finished apartments contained in AN URE 3 is based on an estimate of the shortfall in the number of apartments (just over 31 000 housing units in 2012). Owing to the growth in the number of households, the shortfall in the number of apartments will increase to just over 69 000 apartments by 2030.



Key: Total floor area. Single-apartment buildings. Multi-apartment buildings. Public buildings. Other non-residential buildings

Figure 6: Total floor area of new buildings of individual building stock categories – trends and prognosis

The total floor area of apartments is increasing on account of new apartments and public sector buildings. Building stock in Slovenia will, according to the prognoses for 2030, comprise 50% single-family houses, 23% multi-apartment buildings, 10% public buildings and 17% other non-residential buildings.



Key: Single-apartment buildings. Multi-apartment buildings. Public buildings. Other non-residential buildings

Figure 7: Total floor area of building stock – trends and prognosis (source of data: SORS, Property Register)

2.3. Residential buildings

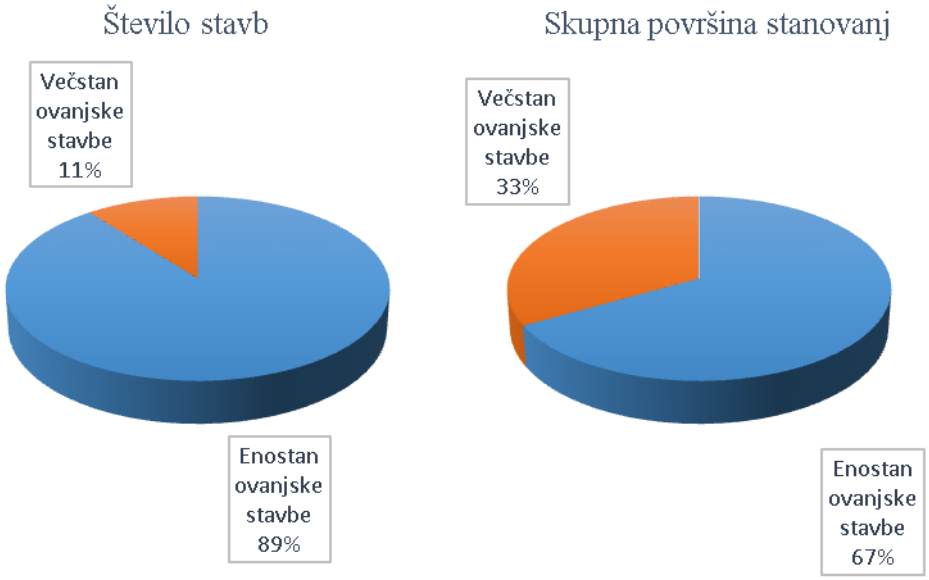
2.3.1. Existing buildings – nearly zero-energy renovation

In order to determine the potentials of nearly zero-energy renovation, we have broken down residential building stock in the Property Register (2013) by year of construction into age classes, taken from the IEE Tabula project.[6] The number of buildings, number of apartments and the floor area was then recorded, by individual CC-SI building classification. Some 89% of the residential building stock comprises single-family buildings, accounting for 67% of the total floor area.

Table 7: State of residential building stock (Property Register)

By type (period of construction)	No of buildings	No of apartments	Au [000 m2]
Single-apartment buildings			
CC-SI 111 (up to 1945)	118 323	118 323	9 348
CC-SI 111 (1946–1970)	96 378	96 378	8 857
CC-SI 111 (1971–1980)	70128	70128	7 165
CC-SI 111 (1981–2002)	132 176	132 176	13 387
CC-SI 111 (2003–2008)	21 395	21 395	2 466
CC-SI 111 (2009–)	14 055	14 055	1658
Multi-apartment buildings			
Two-apartment buildings			
CC-SI 1121 (up to 1945)	8 644	16 665	1214
CC-SI 1121 (1946–1970)	8 215	15 756	1 186
CC-SI 1121 (1971–1980)	5 866	11 242	925
CC-SI 1121 (1981–2002)	4 835	9 157	790
CC-SI 1121 (2003–2008)	679	1 251	109
CC-SI 1121 (2009–)	444	879	61
Buildings with three or more apartments			
CC-SI 1122 (up to 1945)	8 101	46 732	2 685
CC-SI 1122 (1946–1970)	7 009	90 470	4 527
CC-SI 1122 (1971–1980)	3 559	78 075	4 017
CC-SI 1122 (1981–2002)	4 071	70 932	3 760
CC-SI 1122 (2003–2008)	1 458	22 102	1 302
CC-SI 1122 (2009–)	673	11 775	710

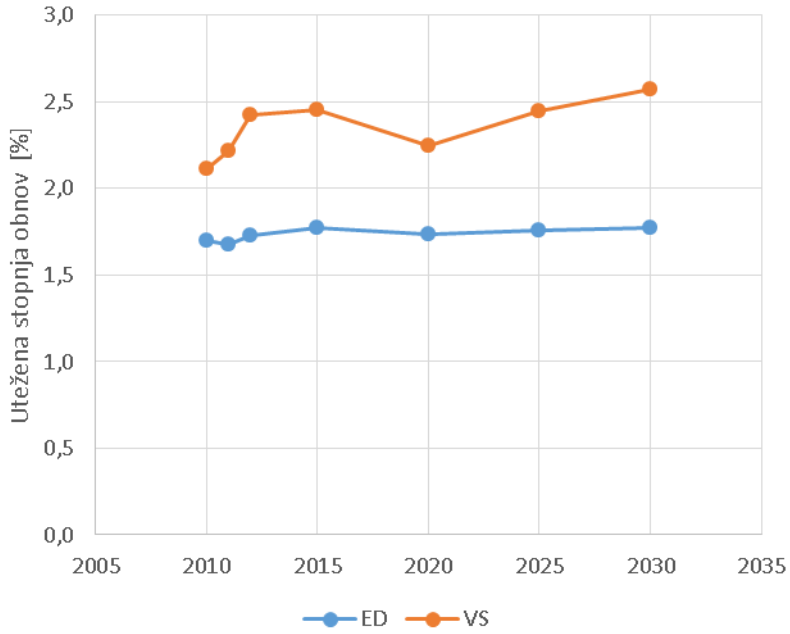
[6] IEE Tabula is a project under the 'Intelligent Energy Europe' programme. It has produced a single European building typology, http://episcope.eu/building-typology/



Key: No of buildings. Total floor area of apartments. Multi-apartment buildings. Single-apartment buildings.

Figure 8: Proportion of the total number and floor area of single-family and multi-apartment buildings according to data from the Property Register.

The weighted reference scenario under the '*Long-Term Energy Balances up to 2030 and the Expert Foundations for Determining National Energy Targets*' was taken for the prognosis of the renovation of the existing residential building stock. Under this scenario, the weighted level of renovation of single-family buildings up to 2030 is around 1.75%, while that of multi-apartment buildings is a little less than 2.5%. Figure 9 shows the prognosis for the renovation of single-family buildings and multi-apartment buildings up to 2030, including nearly zero-energy renovation.



Key: Weighted level of renovation. ED = SF. VS = MA.

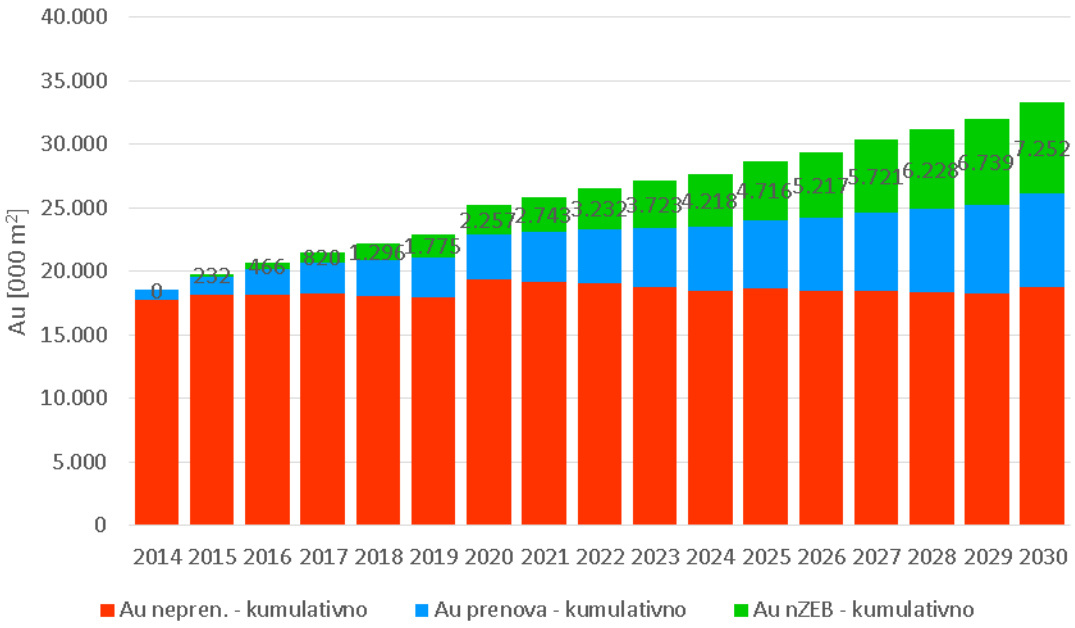
Figure 9: Average weighted level of renovation in the period for single-family (SF) and multi-apartment (MA) buildings in the reference strategy.

The cumulative potential of buildings for complete renovation comprises buildings where at least two elements of the building's thermal envelope (walls, windows, roof) have already reached the end of their lifecycle and require replacement. This potential will increase in the period up to 2030 because each year new buildings requiring complete renovation will join the cumulative potential; on the other hand, according to the envisaged scenario of renovation, the cumulative share of buildings that meet the conditions for complete energy renovation will fall as work is carried out. Complete renovation is divided into renovation following which the building meets the requirements of a nearly zero-energy building (Au nZEB) and other renovation (Au renovation). Renovation restrictions are taken into account when determining the potential share of nearly zero-energy buildings; these restrictions include protection of built heritage, organisational obstacles (co-ownership of buildings, functionality – need to preserve continuity of operations), financial obstacles (financial mechanisms need to be established for more intensive renovation, along with stable sources of financing) and technical obstacles (emergence of innovative solutions for nearly zero-energy renovation, particularly for built heritage).

The share of renovation after which a building may be treated as nearly zero-energy will be small in the initial years. It is expected that renovation under the criteria of nearly zero-energy buildings in the residential building stock will lag behind the renovation of public buildings. The obligations relating to zero-energy new buildings for public buildings begin to take effect on 1 January 2019, and model examples will set the pattern for residential buildings in the transition period. It is therefore envisaged that the share of renovation following which a building meets the requirements of a nearly zero-energy building during the renovation period will gradually

increase and comprise the majority of all renovation under the weighted reference scenario of renovation up to 2030.

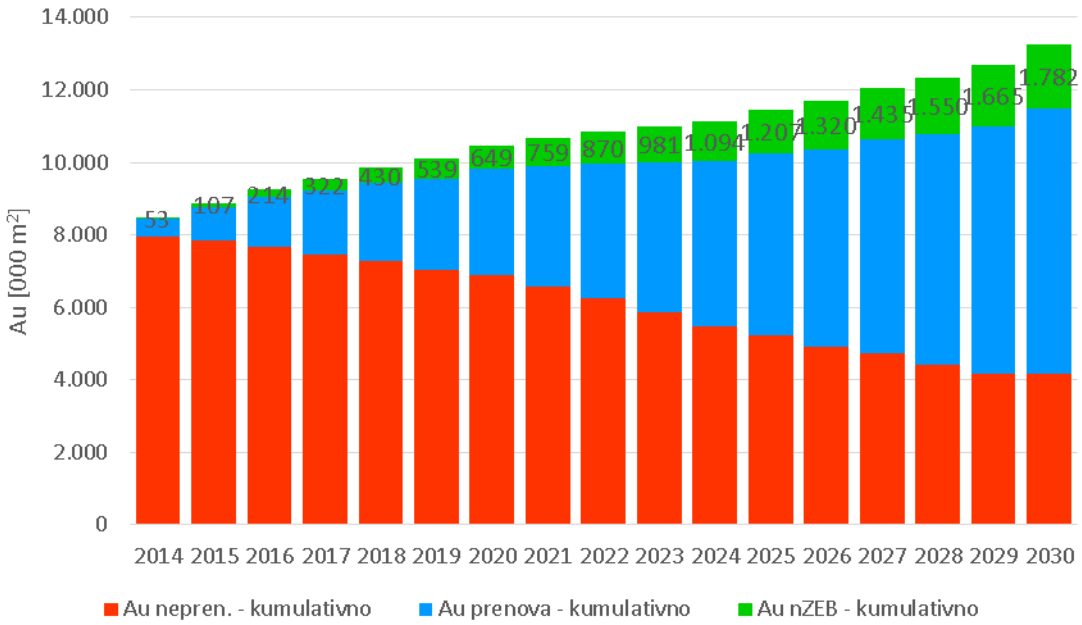
The nearly zero-energy renovation of 2 257 000 m2 of family houses, which are among the buildings requiring complete energy renovation, is envisaged by 2020 (a figure of 232 000 m2 is estimated by 2015).



Key: Au unrenovated – cumulative. Au renovation – cumulative. Au nZEB – cumulative.

Figure 10: Potential for the complete renovation of single-apartment buildings, with an estimate of the scope of nearly zero-energy renovation of existing single-family buildings.

The socially acceptable and financially viable potential for the complete renovation of buildings is slightly lower among multi-apartment buildings than among family houses, the considerable technical potential notwithstanding. In the same way, the nearly zero-energy renovation of 649 000 m2 of multi-apartment buildings, which are among the buildings requiring complete energy renovation, is envisaged by 2020 (a figure of 107 000 m^2 is estimated by 2015).



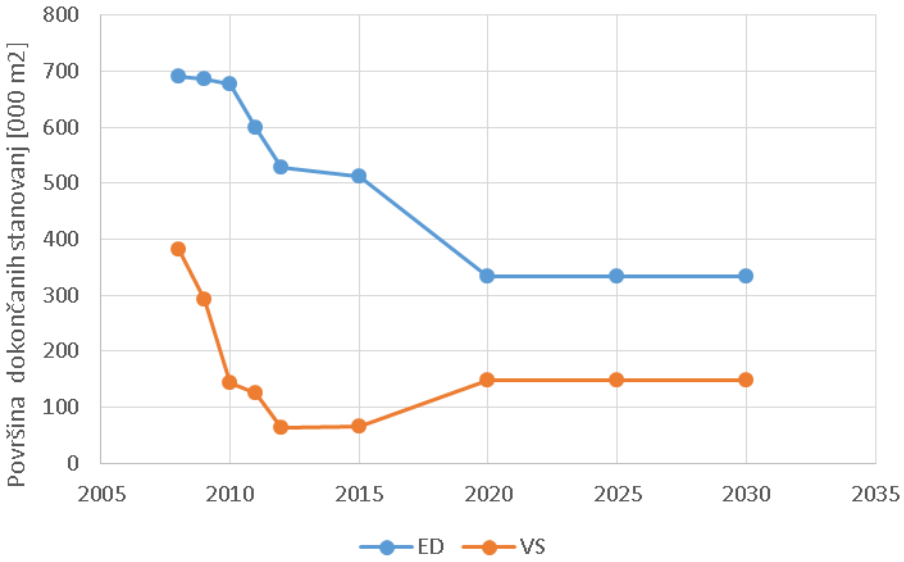
Key: Au unrenovated – cumulative. Au renovation – cumulative. Au nZEB – cumulative.

Figure 11: Potential for the complete renovation of multi-apartment buildings, with an estimate of the scope of nearly zero-energy renovation of existing multi-apartment buildings.

2.3.2. New buildings – nearly zero-energy new buildings

The floor area of finished apartments in family houses and multi-apartment buildings has reduced since the end of 2008 as a result of the economic crisis; this applies in particular to apartments in multi-apartment buildings. The projection[7] for finished apartments by 2030, which forms the basis for an estimate of the share of nearly zero-energy new buildings in the context of the scope of residential construction, is based on a national estimate of the shortfall in housing, which in 2012 amounted to just over 31 000 apartments and will increase to 69 000 by 2030 on account of a growth in the number of households. The total floor area of apartments is increasing as a result of the construction of new housing. Demolition applies to a mere 0.05% of the floor area of the overall building stock.

[7] AN URE 2020, IJS, June 2014.



Key: Floor area of finished apartments. ED = SF. VS = MA.

Figure 12: Prognosis for the floor area of finished apartments separated into single-family (SF) and multi-apartment (MA) buildings by 2030 (source: AN URE 2020)

Under the Recast EPBD, Member States must ensure that all new buildings are nearly zero-energy buildings by 31 December 2020, meaning that the share of new buildings that meet the requirements applying to a nearly zero-energy building must be 100% from 1 January 2021. This share will be achieved gradually, where it will be a relatively small percentage of the residential building stock at the beginning. It is envisaged that the share of nearly zero-energy new multi-apartment buildings will rise significantly only as the deadline set by the Directive for enforcement of the requirement approaches.

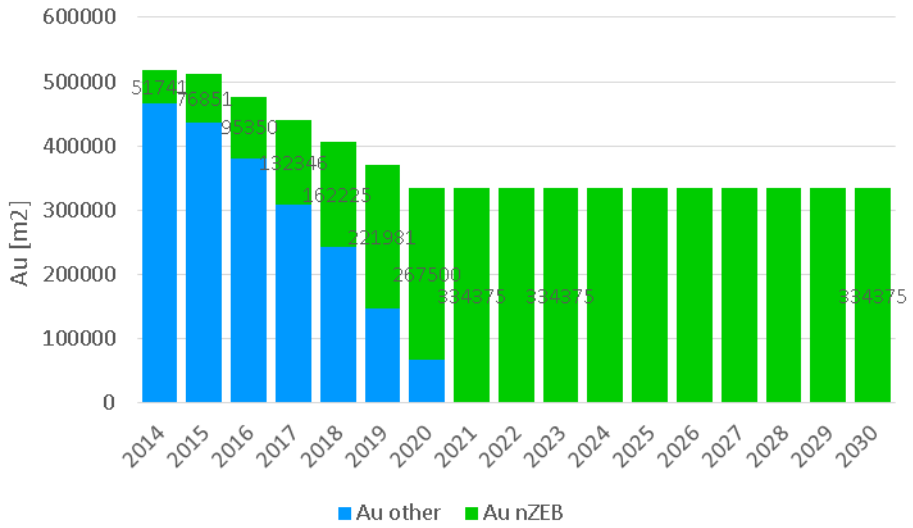


Figure 13: Prognosis for the construction of new single-family buildings, with an estimate of the potential for the gradual introduction of construction of nearly zero-energy single-family houses.

The construction of 267 500 m2 of new nearly zero-energy single-family houses is envisaged by 2020 (an estimated 76 851 m2 by 2015), alongside the construction of 147 300 m2 of new nearly zero-energy multi-apartment buildings by 2020 (9 753 m2 by 2015).

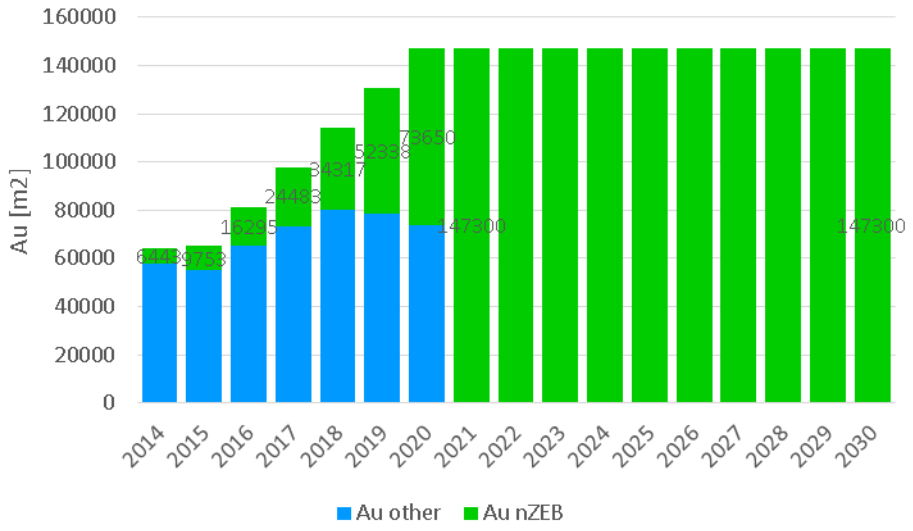


Figure 14: Prognosis for the construction of new multi-apartment buildings, with an estimate of the potential for the gradual introduction of construction of nearly zero-energy multi-apartment buildings.

2.4. Non-residential buildings

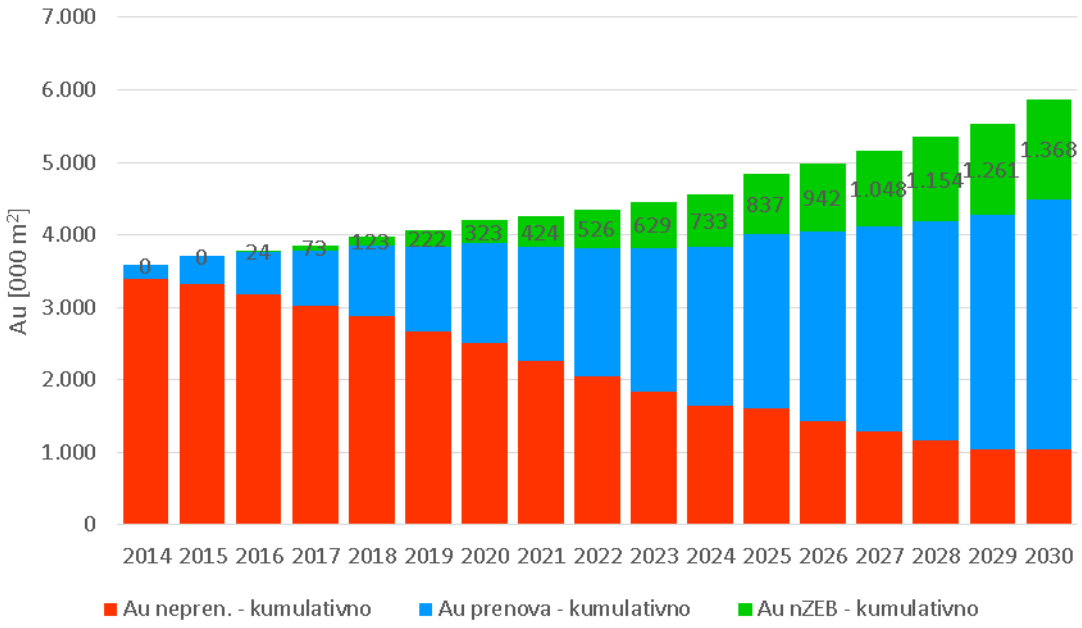
2.4.1. Existing buildings – nearly zero-energy renovation

The cumulative potential of buildings for renovation comprises buildings where at least two elements of the building's thermal envelope (walls, windows, roof) have already reached the end of their lifecycle and require replacement. This potential will increase in the period up to 2030, with the cumulative share of buildings not going for renovation under the envisaged renovation scenario falling. The potential was, in accordance with the procedure described, determined within the framework of data on buildings in the national property register. Complete renovation is divided into renovation following which non-residential buildings meet the requirements of a nearly zero-energy building during the period of renovation (Au nZEB) and other renovation (Au renovation). Renovation restrictions are taken into account when determining the scope of complete nearly zero-energy renovation; these restrictions include protection of built heritage, architectural obstacles, organisational obstacles (co-ownership of buildings, functionality – need to preserve continuity of operations), financial obstacles (financial mechanisms need to be established for more intensive renovation, stable sources of financing), technical obstacles (emergence of innovative solutions for nZEB renovation, particularly for built heritage), and the appropriate training of contractors, planners and providers of nearly zero-energy construction.

The share of renovation after which a building may be treated as nearly zero-energy will be small at the outset. It is expected that nearly zero-energy building renovation will follow on from the renovation of central government public buildings after a delay, since the new building obligation starts on 1 January 2019 for public buildings; they will therefore act as a model for the rest of the building stock. It is therefore envisaged that the share of renovation following which a building meets the requirements of a nearly zero-energy building during the renovation period will gradually increase and comprise the majority of all renovation up to 2030.

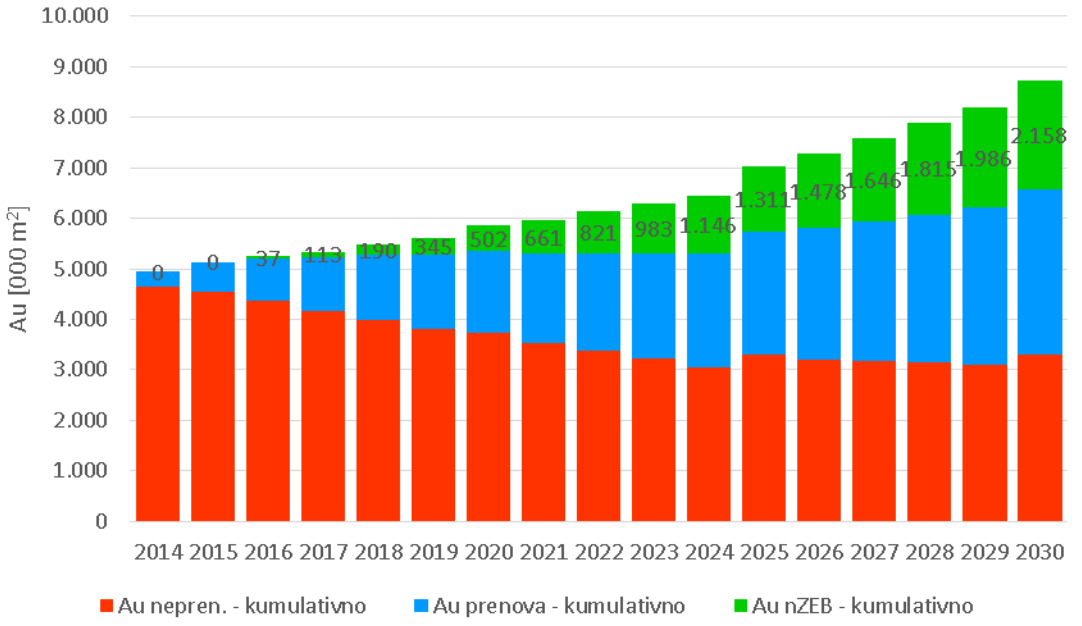
The prognoses for the nearly zero-energy renovation of existing non-residential buildings are based on three groups: public buildings, other non-residential buildings and public buildings owned and used by central government (with a compulsory 3% renovation annually in accordance with the EED Directive).

The nearly zero-energy renovation of 123 000 m2 of public buildings (Figure 15), which are among the buildings requiring complete energy renovation, is envisaged by 2020 in the national plan. This extent will be minimal by 2015, as we have been able to conclude based on interviews with responsible persons in the public sector. For other public buildings (Figure 16), it is envisaged that 190 000 m2 of buildings will be subjected to nearly zero-energy renovation by 2018. Such renovation is not yet envisaged by 2015, with greater intensity expected from 2016 onwards. Renovation of a total of 20 000 m2 of public buildings owned or used by central government (3% renovation annually) (Figure 17) is envisaged to take place by 2020 (2 000 m2 by 2015). These buildings have the potential to act as demonstration projects for nearly zero-energy renovation.



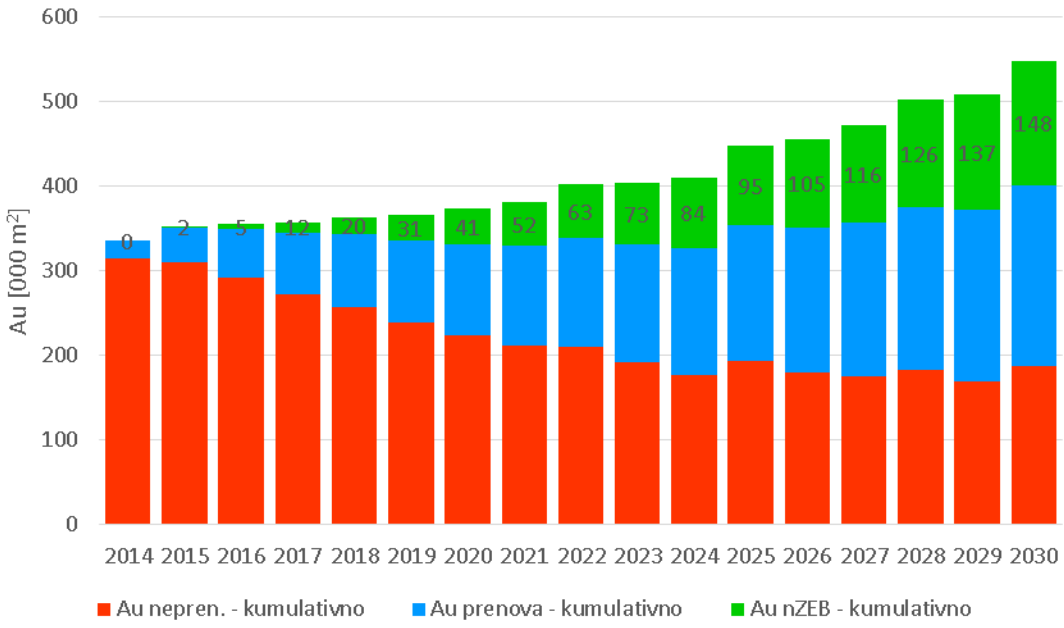
Key: Au unrenovated – cumulative. Au renovation – cumulative. Au nZEB – cumulative.

Figure 15: Potential for the complete renovation of public buildings, with an estimate of the scope of nearly zero-energy renovation of existing public buildings (excluding 3% annual renovation of central government buildings).



Key: Au unrenovated – cumulative. Au renovation – cumulative. Au nZEB – cumulative.

Figure 16: Potential for the complete renovation of other non-residential buildings, with an estimate of the scope of nearly zero-energy renovation of existing other non-residential buildings.

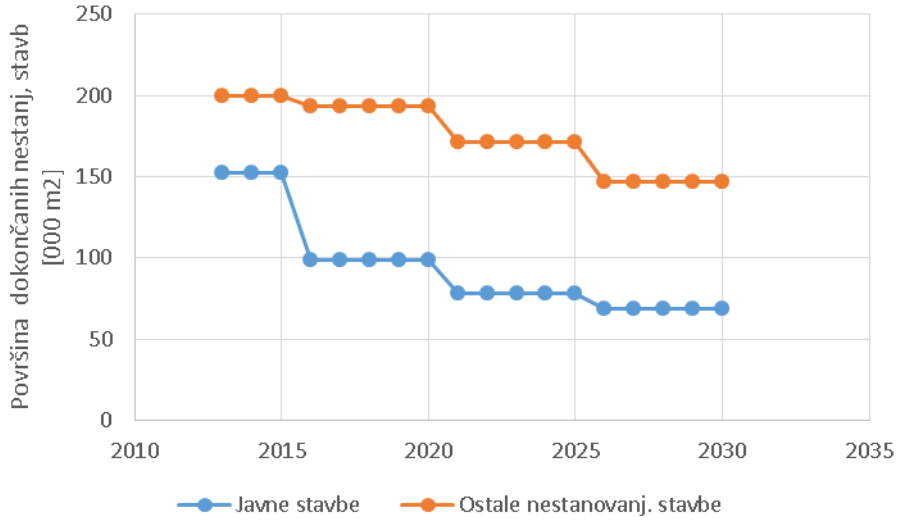


Paste: Au unrenovated – cumulative. Au renovation – cumulative. Au nZEB – cumulative.

Figure 17: Potential for the complete renovation of public buildings owned and used by central government (3% under the EED), with an estimate of the scope of nearly zero-energy renovation.

2.4.2. New buildings – nearly zero-energy new buildings

Under the AN URE 3 and the '*Long-Term Energy Balances of Slovenia up to 2030 and the Expert Foundations for Determining National Energy Targets*', the floor area of new finished buildings in the services sector will fall over the years (Figure 18).



Key: Floor area of finished non-residential buildings. Public buildings. Other non-residential buildings.

Figure 18: Floor area of finished non-residential buildings by 2030 (AN URE 2020)

Under the Recast EPBD, Member States must ensure that all new buildings are nearly zero-energy buildings by 31 December 2018, meaning that the share of new buildings that meet the requirements applying to a nearly zero-energy building must be 100% from 1 January 2019. Under Article 5 of the Energy Efficiency Directive (2012/27/EU), public buildings will act as a model for other building stock. This share will increase uniformly until the deadline for public and other non-residential buildings.

Figure 19: Prognosis for the construction of new public buildings, with an estimate of the potential for the gradual introduction of new nearly zero-energy public buildings.

The construction of 84 126 m2 of new nearly zero-energy public buildings is envisaged by 2018 (an estimated 53 320 m2 by 2015), alongside the construction of 115 970 m2 of other new nearly zero-energy non-residential buildings by 2018 (50 026 m2 by 2015).

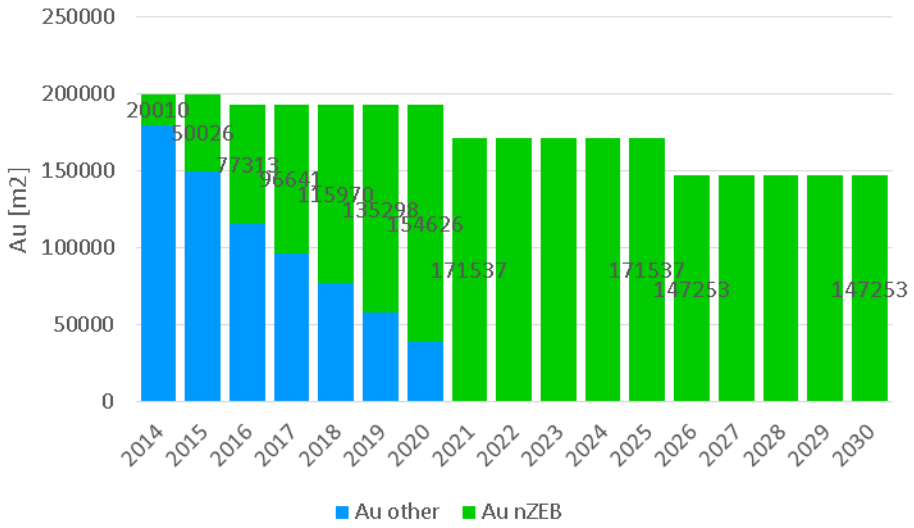


Figure 20: Prognosis for other new non-residential buildings, with an estimate of the potential for the gradual introduction of new nearly zero-energy public non-residential buildings.

3. Intermediate targets for nearly zero-energy buildings by 2015

Tables 8 and 9 summarise the intermediate targets up to 2015 in the area of nearly zero-energy (nZEB[8]) new buildings and renovation until the full introduction of the provisions of Article 9 of the Recast EPBD.

Table 8: Intermediate targets for the nearly zero-energy renovation of buildings in the residential and non-residential sectors, including the public sector

Au nZEB intermediate targets for complete renovation		**2014**	**2015**	**2018**	**2020**
Single-apartment buildings	m2	0.00	231 680		2 257 000
Multi-apartment buildings	m2	53 350	107 000		649 000
Public buildings	m2	0.00	0.00	123 000	
Other non-residential buildings	m2	0.00	0.00	190 000	
Central government public buildings (3% under EED)	m2	0.00	2 000	20 000	

Table 9: Intermediate targets for new nearly zero-energy buildings

Au nZEB intermediate targets for new buildings		**2014**	**2015**	**2018**	**2020**
Single-apartment buildings	m2	51 740	76 850		267 500
Multi-apartment buildings	m2	6 440	9 753		73 650
Public buildings	m2	30 470	53 320	84 126	
Other non-residential buildings	m2	20 010	50 030	115 970	

[8] nZEB – nearly zero energy building

4. Policies and financial and other measures

4.1. Policies and measures for the nearly zero-energy construction of new buildings and nearly zero-energy renovation

The Energy Efficiency Action Plan up to 2020 (AN URE 2020) provides a comprehensive overview of the instruments and programmes for the financing of the construction of energy-efficient buildings and the renovation of the existing building stock. Preparation of the National Building Renovation Strategy is under way (planned for completion in September 2015). The points of departure are set out in two strategic documents which are being drawn up and which will finally be confirmed in brief: in the Operational Programme to Reduce Greenhouse Gas Emissions by 2020 with the Outlook to 2030 and in the Operational Programme for the Implementation of European Cohesion Policy 2014–2020. They are based on previous documents (AN URE 2 and the OP ETID) and the measures in force, and update them.

The points of departure and measures of these policies are as below.

Building accounted for 34% of end-use energy in 2012 (1.6 million tonnes, households 24%, buildings in the services sector, public and private, 10%). Nearly zero-energy buildings, within the context of new buildings as well that of complete renovation, have a special position because, on the one hand, they serve as a model for other projects and, on the other, make a significant contribution to energy-efficiency and the increased use of renewable energy sources in the building sector precisely through the transition to more environment-friendly energy sources.

The planning documents presented in the introduction consistently emphasise that, owing to the ambitious targets in the area of increasing energy-efficiency (AN URE 2020) as well as the long-term vision regarding reducing emissions from buildings by 2050 to almost zero, a situation must be established in the area of buildings so that energy needs are small and are covered as a matter of priority by renewable energy sources.[9] Investments in this sector must therefore be accelerated considerably as a matter of urgency.
The measure requires significant financial investment. However, this is an area capable of attracting large investment capital from funds and other dedicated funds from international financial institutions, as well as private funding sources. As such, it is also important as a measure for rapid economic growth and a way out of the economic and financial crisis. Measures in this sector have considerable synergetic and multiplier effects, and strengthen economic competitiveness and employment in the long term as well. This involves the implementation or

[9]OP RGGE 2020 with the Outlook to 2030, IJS, April 2014, final draft.

promotion of economically justified measures, some of which are more complex, with a relatively long payback period as well as a long lifecycle.

The nearly zero-energy renovation of buildings, as well as the construction of nearly zero-energy buildings (as a model and demonstration), represent, for the Slovenian economy:

- a contribution to meeting environmental commitments;
- a contribution to achieving energy-efficiency;
- greater use of renewable energy sources;
- a model for promoting investments;
- a challenge for green public procurement;
- the promotion of development and innovation;
- initiation of an investment cycle and the strengthening of the economy/construction, with a range of multiplier effects.

The existing and already adopted measures do not suffice to achieve the targets of the climate energy package and do not activate all the potentials for growth and development in this area. The range of measures is defined in the AN URE 2 and AN OVE documents. New measures are in preparation as part of the Operational Programme for the Implementation of European Cohesion Policy 2014−2020; the updates to the existing measures for achieving the ambitious targets by 2020 are proposed in the Proposed Operational Programme to Reduce Greenhouse Gas Emissions by 2020 with the Outlook to 2030. The objective is to introduce a number of new instruments so as to promote increased building renovation with lower costs to the public purse. The activities will be focused on opening up possibilities for financing from private sources, encouraging the provision of dedicated grants, and promoting energy contracting instruments and green loans. Activities will also be directed towards acquiring dedicated grants from international institutions. A number of instruments which have already been introduced and which have not yet been directed towards reducing greenhouse gas emissions and achieving energy savings will also need to be directed towards achieving these targets.

The key new features regarding the measures already adopted are:

- the upgrading of regulations on the energy-efficiency of buildings so as to encourage energy renovation (they are currently focused on new buildings);
- integration of climate and energy targets into tax policy to promote the energy renovation of buildings through excise policy and other taxes;
- the provision of grants, financing of schemes, particularly from dedicated funds and programmes of international financial institutions for the public and housing sector, and the directing of part of the incentives to promoting the provision of grants.

Some instruments that have been adopted have not yet come into force or the funds for their implementation have not yet been provided. Activities will be strengthened so as to compensate for the shortfall in the implementation of measures from the AN URE 2 and AN OVE programmes and ensure the provision of funds:

- for directing part of financial incentives to the introduction of energy contracting. This measure is planned within the framework of the 'Sustainable consumption and production of electricity and smart networks' priority of the Operational Programme for the Implementation of European Cohesion Policy 2014−2020;
- the establishment of a support scheme for the supply of heat from renewable energy sources. This measure is confirmed in the EZ-1, with implementing regulations also being drawn up;
- the directing of part of financial incentives to demonstration projects. This measure is also planned within the framework of the 'Sustainable consumption and production of electricity and smart networks' priority of the Operational Programme for the Implementation of European Cohesion Policy 2014−2020;
- the implementation of measures to optimise the operation of energy systems as part of the financing of the energy renovation of buildings, and for other buildings with financing from energy contracting.

The necessary funds for the financial incentives in the 2014–2020 period will have to be provided for new activities and the continuation of activities already planned. Funds will be provided and activities carried out for:

- the upgrading of financial aid for vulnerable groups of people with assistance in the form of social work (see Section 3.1.4);
- the development of solutions for the renovation of built cultural heritage and for other special building groups. The measure will be compiled in detail in the course of the next phases of preparation of the Long-Term Building Renovation Strategy;
- support for the energy renovation of buildings with the integration of efficient energy use targets and support measures for the energy renovation of buildings into housing legislation (particularly with regard to decision-making on renovation and the financing of renovation in multi-apartment buildings) and into other housing policy measures;
- the further financing of the energy renovation of buildings in the public sector.

The following supplements to measures will be drawn up in relation to new buildings:

- the updating of regulations and the certification of buildings with the aim of reducing greenhouse gas emissions within the lifecycle (e.g. the introduction of materials with lower emissions, etc.);
- the promotion of energy-efficiency within the framework of spatial planning.

The responsibilities for specific new and supplemented tasks and the timetable of implementation of the measures are defined in the table. See also the reference documents for the measures already adopted.

4.2. Placing of nearly zero-energy buildings within the set of existing measures and instruments

Below is a list of existing and new measures and instruments that affect the area of buildings and that comply with the targets in force in relation to energy-efficiency, the use of renewable sources (AN OVE 2020) and climate (OP RGGE 2020–2030) in the actual comprehensive form laid down in the AN URE 2020 (as at June 2014).

Nearly zero-energy construction and renovation represent a substantive upgrading of activities already planned within measures relating to the energy renovation of building stock, the tightening of regulations for the construction of new buildings, the setting of criteria for the activities that the public sector, as the leading sector in the area of energy-efficiency, is obliged to carry out.

The list of measures below is supplemented by early activities for promoting the introduction of nearly zero-energy buildings by 2020, which is the deadline for complete compliance with the provisions of Article 9 of the Recast EPBD.

Table 10: Existing measures

Ref.	Instrument	New measure or upgrading of existing measures	Type of measure/Entity responsible	Target group	Deadline
V.1	**Regulations on the energy performance of buildings** **Supplementing of the instrument**	OP TGP-2020/Supplementing of requirements for the introduction of nearly zero-energy buildings. Updating of regulations in relation to building renovation requirements. Updating of regulations in relation to reducing greenhouse gas emissions within the lifecycle. ***Link with nZEB:*** *Revision of PURES 2010 and its supplements with minimum technical requirements for nearly zero-energy buildings*	Regulation/ministry responsible for spatial planning	All buildings	
H.1	**Energy contracting** **Supplementing of the instrument**	OP RGGE-2020/Preparation of acts for the public sector OP ICP 2014–2020 /	Regulations/ministry responsible for finance Financial incentives/ministry responsible for energy	All buildings	
Additional AN URE 2 measures	**Energy-efficiency within the framework of sustainable spatial planning**	AN URE 2, additional measures, AN OVE, Measure 22. ***Link with nZEB:*** *Ensuring greater use of renewable energy sources in nearly zero-energy buildings, particularly the use of renewable energy sources in buildings, land parcels, nearby*	Regulations/ministry responsible for spatial planning		
G.1	**Financial incentives for energy-efficient renovation and sustainable construction of residential buildings** **Upgrading with instrument:** • **Grant schemes** • **Demonstration projects**	OP RGGE-2020/Eco-Fund loan schemes and incentives to other providers of green loans for the residential sector. Financing of schemes, particularly from purpose-specific funds and programmes of international financial institutions. Link with incentives to introduction of energy contracting. OP ICP 2014–2020/Pilot/demonstration projects for the energy-efficiency improvements to multi-apartment buildings in the private and public sectors (e.g. workers' hostels, apartments provided by housing funds, etc.) within the context of energy contracting. OP ICP 2014–2020/Energy-efficiency improvements to buildings, with the involvement of housing cooperatives, to be implemented as part of integrated territorial investments (ITI) in selected urban areas. Support will also be aimed at management and at technical and organisational support for the renovation of multi-apartment buildings. OP RGGE-2020/Provision of funds for demonstration projects and	Financial incentives/ministry responsible for energy OP RGGE-2020/Provision of funds for demonstration projects and acceleration of the measure.	Residential sector Residential sector	

Ref.	Instrument	New measure or upgrading of existing measures	Type of measure/Entity responsible	Target group	Deadline
		acceleration of the measure. ***Link with nZEB:*** *nZEB demonstration project for new buildings, particularly in the public sector and nZEB for the renovation of existing buildings, application of innovative nZEB technologies*			
G.2	**Financial incentives for energy-efficient heating systems** **Upgrading as for G.1 and:** • **Support scheme for the generation of heat from renewable energy sources**	AN URE 2 AN OVE, Measure 25. ***Link with nZEB:*** *nZEB buildings require incentives in relation to the use of heat from renewable energy sources, whether the heat from renewable energy sources is generated in the building or nearby, or from a district heating system using e.g. wood biomass*	Financial incentives/ministry responsible for energy		
G.3	**Aid scheme for energy-efficiency improvements for vulnerable groups of people**	AN URE 2 OP ICP 2014–2020/Energy-efficiency improvement measures in households faced with the problem of fuel poverty. The measures will be aimed at investments as well as advice and measures to change patterns of behaviour.	Financial, technical and social aid/ministry responsible for energy	Residential buildings containing vulnerable households	
G.4	**Compulsory division and calculation of heating costs in multi-apartment and other buildings according to actual consumption**	AN URE 2	Regulations/ministry responsible for energy	Housing sector/multi-apartment buildings	
G.5	**Energy advice network for citizens** **Upgrading of the instrument with elements that support Measure G.3**	AN URE 2 ***Link with nZEB:*** *ENSVET is crucial for providing information to and raising the awareness of target groups regarding nZEB*	Advice/ministry responsible for energy	Residential buildings generally and special groups: multi-apartment buildings, vulnerable households	

Ref.	Instrument	New measure or upgrading of existing measures	Type of measure/Entity responsible	Target group	Deadline
J.1	**Green public procurement**	AN URE 2 ***Link with nZEB**: green public procurement has to be supplemented in the legal bases by technical criteria for nZEB in the design and implementation of works*			
J.2	**Financial incentives for energy-efficient renovation and sustainable construction of buildings in the public sector Upgrading of the instrument with elements:**	AN URE 2 ***Link with nZEB**: key instrument for the early introduction of nZEB in the public sector, which must serve as a model, involves nZEB in construction and renovation.*			
	• **Financing 2014–2020**	AN URE 2, Measure J.2 OP ICP 2014–2020/In the 2014–2020 period, funds will be aimed at energy improvements to public sector buildings owned and used by direct and indirect budget users and municipalities. ***Link with nZEB**: mobilisation of nZEB within the framework of 3% of public buildings and other public buildings* The incentives will encourage investors to undertake comprehensive energy-efficiency improvement measures and, at the same time, to protect the environment, particularly through emission reduction, nature conservation, the use of natural materials and the promotion of energy-efficiency technologies. OP RGGE-2020/In 2014 25% and in 2020 80% of all financial support for energy-efficiency improvements to public buildings will be directed towards promoting energy contracting.	Financial incentives/ministry responsible for energy	Public sector	
	• **Quality assurance for public sector projects**	AN URE 2, Measures J.2 and J.3, AN OVE, Measure 35 OP ICP 2014–2020/The establishment and operation of an 'office' as a coordinating body for project implementation will be supported, as will measures to improve the energy-efficiency of buildings or individual building elements, replace building fixtures, rehabilitate heating and cooling systems and improve the efficiency of interior lighting. OP ICP-2020/financial incentives for the preparation of investment projects in the public sector. ***Link with nZEB**: mobilisation of nZEB within the framework of 3% of public buildings and nZEB for other public buildings*	Group of instruments/ministry responsible for energy	Public sector	
	• **Promotion of optimisation**	The measure will be carried out within the framework of investments in the energy-efficient renovation of public buildings in the 2014–2020 period for			

Ref.	Instrument	New measure or upgrading of existing measures	Type of measure/Entity responsible	Target group	Deadline
	of the operation of energy systems (RE-CO)	achieving greater savings by optimising the operation of energy systems and promoting energy-efficient conduct on the part of users. The options for implementing measures to optimise the operation of energy systems in other existing public administration buildings through financing in the form of energy accounting and with the support of the above-mentioned 'office' and local energy agencies will be studied.			
	• **Demonstration projects**	AN URE 2, Measures I.5, J.2, J.4, H.1, H.3 OP RGGE-2020/Provision of funds for demonstration projects and acceleration of the measure. OP ICP 2014–2020/Pilot/demonstration projects for the energy-efficiency improvements to multi-apartment buildings in the private and public sectors (e.g. workers' hostels, apartments provided by housing funds, etc.) within the context of energy contracting. Implementation of demonstration projects for the complete energy renovation of various building types (public sector buildings, multi-apartment buildings, cultural heritage buildings). ***Link with nZEB:*** *very important – establishment of nZEB demonstration projects in the private and public sectors*	Financial incentives/ministry responsible for energy	Public sector	
J.3	**Introducing an energy management system in the public sector**	AN URE 2	Regulations/ministry responsible for energy	Public sector	
J.4	**Financial incentives for efficient electricity consumption in the public sector** **Upgrading as for J.2**	AN URE 2020	Financial incentives/ministry responsible for energy	Public sector	
V.3	**Support scheme for electricity generated from renewable energy sources and high-efficiency CHP**	AN URE 2	Financial incentives/ministry responsible for energy	All buildings	
H.3	**Information and awareness-raising activities**	AN URE 2 ***Link with nZEB:*** *information and awareness-raising regarding nZEB*	Promotion and information-provision/ ministry responsible for energy	All buildings – by target group	
H.4	**Training programmes**	AN URE 2 ***Link with nZEB:*** *training of providers of nearly zero-energy buildings*	Training/ministry responsible for energy and	All buildings – by target group	

Ref.	Instrument	New measure or upgrading of existing measures	Type of measure/Entity responsible	Target group	Deadline
		('build-up skills'), training of project designers and supervisors, training accreditation system and certification of providers	ministry responsible for public administration		

Table 11: New measures

Ref.	Instrument	New measure or upgrading of existing measures	Type of measure/Entity responsible	Target group	Deadline
Buildings new Measure-1	Support scheme for the renovation of built cultural heritage and other special building groups	Preparation and implementation of a new instrument for the renovation of built cultural heritage and other special building groups: development of renovation criteria, demonstration projects, development and introduction of technology, financial support scheme, provision of funds for the 2014–2020 period. ***Link with nZEB: application*** *nZEB in cultural heritage buildings (emphasis on renewable energy sources in heritage buildings alongside energy-efficiency solutions) – cultural heritage buildings predominate among public buildings*	Group of instruments/ministry responsible for construction and ministry responsible for culture	Cultural heritage buildings and other special building groups	
Buildings new Measure-2	Integration of climate targets and energy policy into tax policy	Integration of climate targets and energy policy into tax policy to promote the energy renovation of buildings through excise policy (excise duty on heating fuel) and other taxes.	Taxes and fees/ministry responsible for finance	All buildings	
Buildings new Measure-3	Integration of climate targets and energy policy into housing legislation and policy	Partly in AN OVE, Measures 30 and 28 Housing legislation regulations (reserve funds, energy contracting in multi-apartment buildings) ***Link with nZEB:*** *nZEB and the possibilities of links with energy contracting, link between contracting and cost-optimal criteria for buildings*	Regulations and other instruments/ministry responsible for housing policy	Residential buildings	