

**BUILD2LC Project**  
**Boosting Low Carbon Innovative Building  
Rehabilitation in European Regions**

State of Art, SWOT analysis and  
identification of needs

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*Region: Slovenia*

# 1 STATE OF ART OF ENERGY REHABILITATION IN BUILDINGS

## 1.1 Brief Picture of the Region

### Economic Outlook

With excellent infrastructure, a well-educated work force, and a strategic location between the Balkans and Western Europe, Slovenia has one of the highest per capita GDPs in Central Europe. Slovenia became the first 2004 European Union entrant to adopt the euro (on 1 January 2007) and has experienced one of the most stable political transitions in Central and Southeastern Europe. In March 2004, Slovenia became the first transition country to graduate from borrower status to donor partner at the World Bank. In 2007, Slovenia was invited to begin the process for joining the OECD; it became a member in 2012. However, long-delayed privatizations, particularly within Slovenia’s largely state-owned and increasingly indebted banking sector, have fueled investor concerns since 2012 that the country would need EU-IMF financial assistance. In 2013, the European Commission granted Slovenia permission to begin recapitalizing ailing lenders and transferring their nonperforming assets into a “bad bank” established to restore bank balance sheets. Yield-seeking bond investors’ strong demand for Slovenian debt helped the government in 2013 to continue to finance itself independently on international markets. The government has embarked on a program of state asset sales intended to bolster investor confidence in the economy, which in 2014 is poised to contract 1%, its third-year of recession.

Economic growth is projected to slow in 2016 owing to sluggish global trade and temporarily weaker public investment as EU-financed projects slow down. Growth will pick up in 2017 as a strengthening labour market boosts private consumption, and improved financial conditions and stronger balance sheets of companies enhance private investment. Inflation will remain low due to remaining slack in the economy. Unemployment will fall over the projection period.

<b>Slovenia</b>	
Year of EU entry	2004
Member of Schengen area	Yes
Political system	Republic
Capital city	Ljubljana
Total area	20 273 km <sup>2</sup>
Population	2 million
Gross domestic product year 2015	38.570 (EUR mio)
GDP per capita year 2015	18.693 (EUR)

Table 1: Slovenia in numbers

Continued corporate, and especially SME, restructuring and a reduction of non-performing loans remain priorities to revive credit flows. Continued fiscal effort is needed to tackle the still rising public debt, while the incomes of the poorest need to be protected. Structural reforms to pensions, education and health care could boost growth and bring savings without jeopardising service quality.

Productivity could be boosted by lowering regulatory burdens and implementing the privatisation programme. These reforms would also help stimulate more foreign direct investment, improve corporate governance, attract new technologies and raise innovative activity. Lowering the high tax wedge on labour income could boost employment, especially of the high-skilled.

<b>Forecasts for Slovenia</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
GDP growth (% yoy)	3	2,9	1,7	2,3
Inflation (% yoy)	0,4	-0,8	-0,2	1,6
Unemployment (%)	9,7	9	8,6	8,1
Public budget balance (% of GDP)	-5	-2,9	-2,4	-2,1
Gross public debt (% of GDP)	81	83,2	80,2	78
Current account balance (% of GDP)	6,5	7	7	6,9

Table 2: European Economic Forecast Spring 2016, Forecasts for Slovenia, May 2016 (Source: [www.ec.europa.eu/economy\\_finance](http://www.ec.europa.eu/economy_finance))

## 1.2 State of Play

### Building sector

Buildings accounted for 34 % of end-use energy consumption in 2012 (1.6 million t, households 24 %, buildings in the service sector, public and private, 10 %). Buildings contribute 17 % of indirect greenhouse gas emissions (share of emissions for which national targets have been adopted under Decision 2009/406/EU). The potential for raising energy efficiency and reducing greenhouse gas emissions is very great with regard to buildings, i.e. through the renovation of existing buildings and the replacement of the energy products used.

The long-term vision is for there to be almost no GHG emissions from buildings by 2050; this will be achieved by buildings having low energy requirements that are covered by renewable energy sources as a matter of priority. Investments in this sector must therefore be accelerated considerably as a matter of urgency.

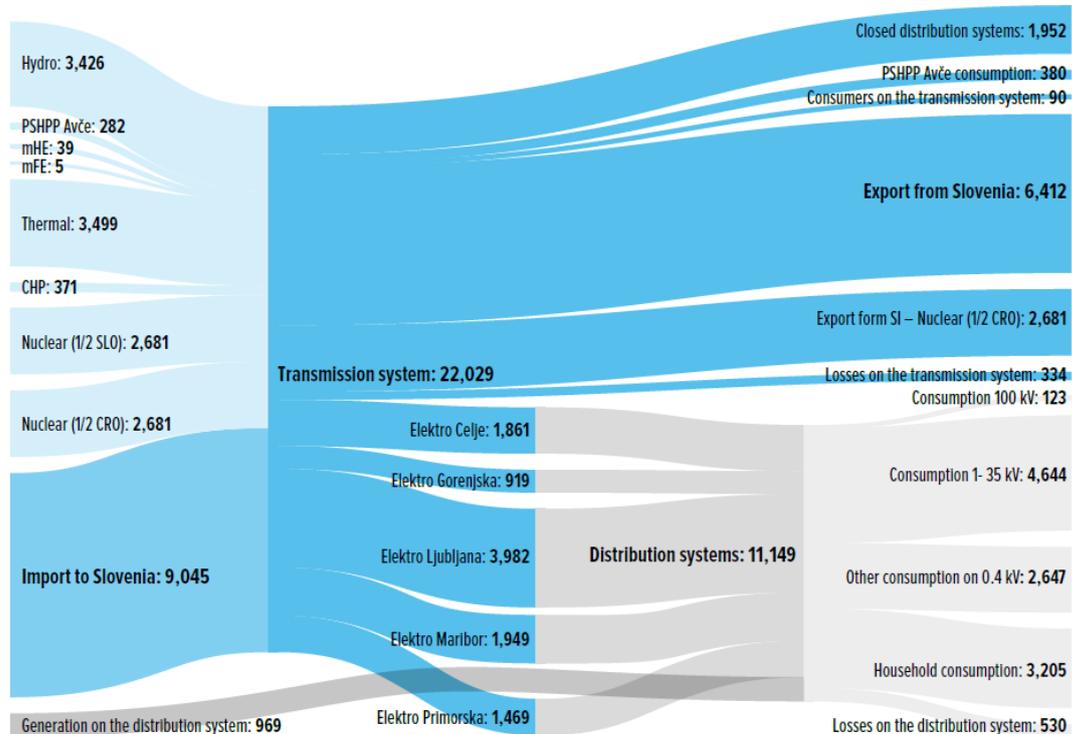
In the 2014–2020 period, 16.8 million m<sup>2</sup> of floor area in the housing sector and 6 million m<sup>2</sup> of floor area in the non-residential sector will be partly or comprehensively renovated in order to achieve the target. It is envisaged that one third of the housing sector will be renovated with the financial support of the state. Renovated buildings represent 26 % of the floor area of the entire building stock of 2010.

The expected total reduction in GHG emissions in buildings in 2020 is 439 kt CO<sub>2</sub> equivalent/year, which will be achieved with measures carried out across the entire 2013–2020 period.

### Electricity supply and demand

In 2015, to the transmission and distribution system 13,954 GWh of electricity was delivered, which meant 2328 GWh less than in 2014. The delivery from generating plants using RES was 4595 GWh, which was 2217 GWh less than the previous year, generating plants using fossil

fuels contributed 3997 GWh, or 587 GWh more than the year before. The nuclear power plant Krško delivered 5362 GWh to the transmission system, or 698 GWh less. These quantities are taken from the balance sheets of electricity producers on the basis of physical flows.



Graphicon 1: Balance of electricity supply and demand on the transmission and distribution systems in 2015 in GWh (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)

Primary energy sources for electricity generation in 2015	GWh	Share
Fossil fuels	3.997	29%
Nuclear fuel	5.362	38%
RES	4.595	33%
hydro	4.056	
wind	6	
solar	248	
biomass	285	
<b>Total delivery of electricity</b>	<b>13.954</b>	<b>100%</b>

Table 3: Primary energy sources for electricity generation in 2015 (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)

The share of electricity generated in hydro power plants and plants using other RES annually vary, depending on hydrological and other conditions, and the investments in new generating facilities using RES. In 2015, this share was around 33% of all generated electricity in Slovenia, which was 9 percentage points less than the previous year, when hydrological conditions were extremely favourable. Plants using fossil fuels contributed to the total production around 29%,

which was by 8 percentage point higher share, and the nuclear power plant 38% of all generated electricity.

At the end of the year, a total of 940,789 electricity consumers were connected to the electricity network. In comparison to the previous year, the number of consumers increased by 3906 consumers, or 0.4%, while the electricity consumption by the type remained the unchanged. The number of household consumers with two-tariff metering consumption increased by 1.4%, and by 1.6% decreased the number of household consumers with single tariff metering.

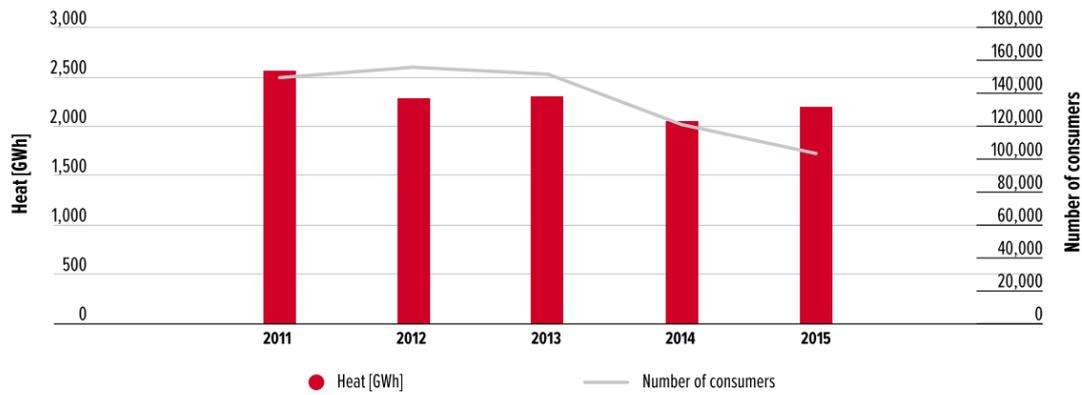
<b>Electric consumption (GWh)</b>	<b>2014</b>	<b>2015</b>	<b>Index</b>
Business consumption on the transmission system	2.033	2.042	100,4
- Closed distribution systems	1.953	1.952	99,9
- Consumers, connected directly to the transmission system	80	90	112,5
Business consumption on the distribution system	7.198	7.414	103,0
<b>Total business consumption</b>	<b>9.231</b>	<b>9.456</b>	<b>102,4</b>
<b>Household consumption</b>	<b>3.125</b>	<b>3.205</b>	<b>102,6</b>
- Single tariff consumption	892	898	100,7
- Two-tariff consumption	2.233	2.307	103,3
Consumption of PSHPP Avče	363	380	104,7
<b>Total consumption of end consumers</b>	<b>12.719</b>	<b>13.041</b>	<b>102,5</b>
Losses in the transmission and distribution systems	821	864	105,2
<b>Total electricity consumption</b>	<b>13.540</b>	<b>13.905</b>	<b>102,7</b>
Export	9.997	9.094	91,0
<b>Total</b>	<b>23.537</b>	<b>22.999</b>	<b>97,7</b>

Table 4: Electricity consumption in 2014 and 2015 (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)

### Heat distribution

In Slovenia in 2015 heat distribution was carried out by 53 distributors in 58 municipalities from 91 distribution systems.

The heat distributors in 2015 supplied 103,459 consumers; they were delivered 1839.5 GWh of heat. Heat consumption from all distribution systems was higher by 11.93% in comparison with the previous year. The number of consumers connected to the distribution systems of district heating compared to 2014 decreased by 14.35%. The main reason was consumers decision to use currently cheaper sources of heat.

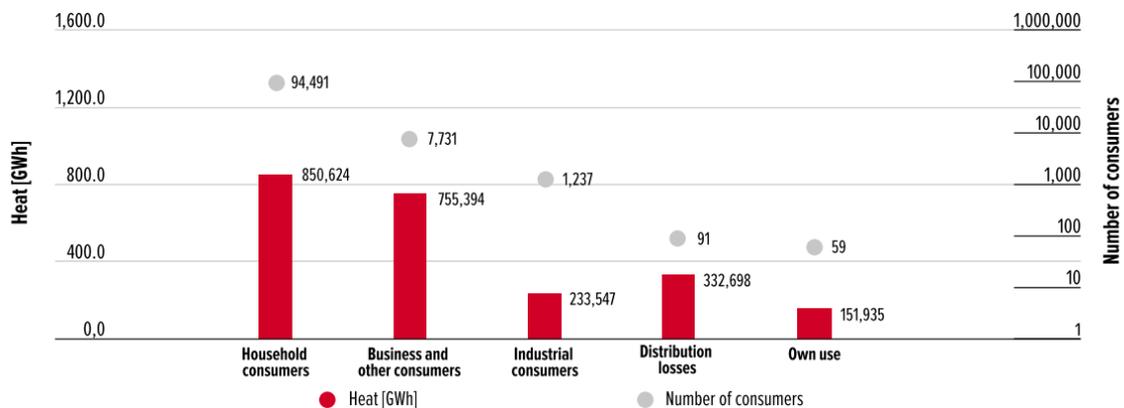


Graphicon 2: Heat consumption and the number of heat consumers in the period 2011–2015 (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)

In Slovenia, only two large distribution systems exist, with a total installed capacity of 3.88 MW of cooling units. The cooling distribution system with a total installed capacity of 0.965 MW, which uses heat from district heating, operates in the Municipality of Velenje, and the cooling distribution system with the installed capacity of electrical generators 2 X 1.45 MW in a former industrial complex of the company Iskra Labor in the Municipality of Kranj.

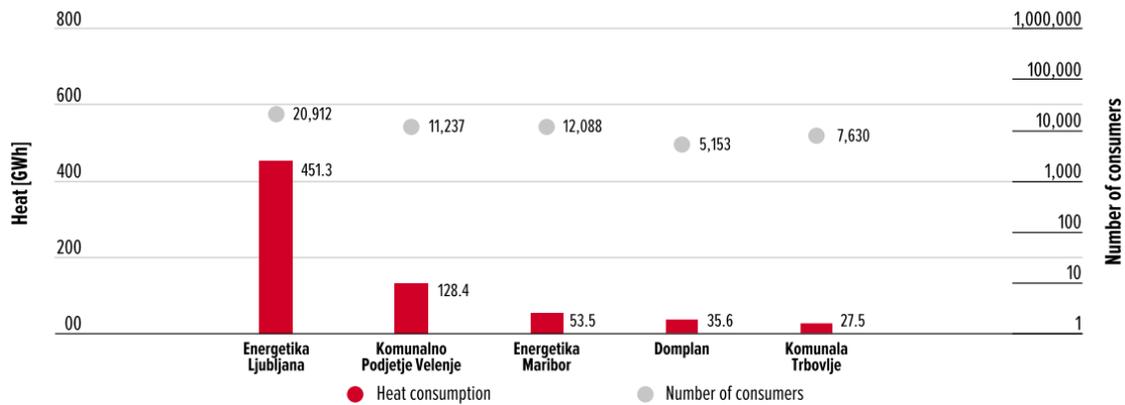
For heat supply, producers of heat with their own production and heat producers that supply heat to distribution systems in 2015 generated 2324.2 GWh of heat and 718 GWh of electricity, or 640 GWh at the busbars of the cogeneration processes for heat supply. The share of heat generated to supply distribution systems from cogeneration accounted to 83.8% of all generated heat.

The largest share of useful heat, 36.6% was used for 94.491 household consumers; 32.5% for the supply to 7731 business consumers, and 10% of heat for 1237 industrial consumers. Losses in the district heating networks are estimated to 16.1% of heat delivered to the distribution network and are by 2.9% lower compared to 2014. The difference between the produced and supplied heat and heat losses presents the share of heat, which was used in industrial processes of producers or suppliers.

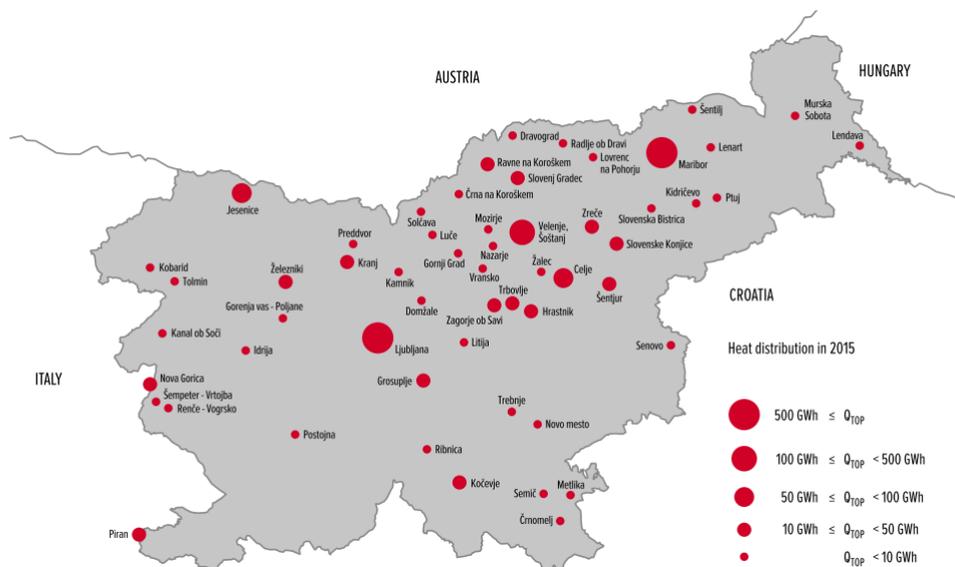


Graphicon 3: Heat consumption by the type of consumers and numbers of consumers (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)

In the structure of primary energy sources used for the production of heat, coal still prevailed covering 55%, followed by natural gas with 25.7%. Renewable sources covered 16.2%; 2.2% of heat was produced in the municipal waste-incineration plant (Celje Heating Plant); oil and oil products had 0.9 percent share.



Graphicon 4: The largest distributors of heat by the amount distributed to household consumers in 2015 (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)



Graphicon 5: Heat distribution systems in 2015 (Source: Slovenian Energy Agency, Report on the energy sector in Slovenia for 2015)

### 1.3 Link to the RIS3

Slovenia decided to contribute to improve energy efficiency by 20% by 2020 in line with the new Directive 2012/27/EU with two specific objectives. In document Operational Programme for the Implementation of the EU Cohesion Policy in the Period 2014-2020 the objectives are described in chapter 2.4.3 Supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector.

### **Specific objective 1: Improve energy efficiency in the public sector**

It is relatively difficult to estimate the energy savings made in the public sector in Slovenia, as the statistical record system does not provide accurate actual energy consumption values for the public sector, given that energy statistics is not run separately but together with other data on energy consumption by source, i.e. the service sector and the agriculture. According to energy-end use estimates<sup>79</sup>, hospitals consume most final energy in the public sector (lighting excluded), followed by primary and secondary schools, higher education institutions and research institutions, public administration buildings, cultural and leisure buildings. Project data suggest that, on average, energy savings in case of energy renovation amount to 50%.

The new Directive 2012/27/EU on energy efficiency stipulates that each Member State ensures that, as from 9 July 2015, 3 % of the total floor area of heated and/or cooled buildings owned and occupied by its central government is renovated each year. Investments will support our efforts in this direction. Slovenia will also follow the requirements of the Directive 2010/31/EU which sets out that the Member States should ensure that new buildings occupied and owned by public authorities are nearly zero-energy buildings from 2018 onwards. To this end, the country will support investments in the energy renovation of buildings and construction of new buildings according to the nearly-zero energy standards as provided for in point 4 of Article 5 of Directive 2012/27/EU.

Results:

- energy end-use savings in the building stock of the public sector,
- energy renovated floor area of buildings occupied or owned by the central government.

### **Specific objective 2: Improve energy efficiency in households**

The potential to improve energy efficiency in Slovenia is huge, also on account of the building stock structure, which is considerably unfavourable. Some 29% of single family detached houses have not been subject to energy renovation, 26% of them underwent only partial energy renovation and are in need of further improvements. The same is true for multi-family residential buildings where as much as 34% of the building stock has not undergone any kind of energy renovation, 28% of the building stock having been partially renovated by a single energy renovation measure<sup>80</sup>. Considerable efforts will have to be made to boost the efforts of renovation of multi-family residential buildings, there are now certain barriers that hinder successful retrofit of these buildings, and pilot projects will have to be promoted in the area of energy performance contracting. The renovation of flats occupied by deprived households will contribute to tackling the growing issue of energy poverty.

Result:

- energy end-use savings in the household sector.

## **1.4 Policy Instruments. Regional and National Plans and Policies on Energy Rehabilitation of Buildings**

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 and AN OVE documents. New measures are being prepared within the Operational Programme for the Implementation of European Cohesion Policy 2014–2020. Supplementing of the existing measures to achieve the ambitious 2020 targets is proposed in Operational Programme for Reducing 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 performance 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 (particularly as part of spatial planning and tax and housing policy). The objective is also to achieve greater synergy between incentives to improve energy efficiency, increase the share of RES, reduce greenhouse gas emissions and ensure air quality by designing measures, monitoring them and thereby reducing the overall costs of meeting international obligations in these areas.

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);
- the provision of grant 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;
- the formulation of criteria for the architectural/design aspect of energy renovation so that measures for the energy renovation of cultural heritage buildings do not damage or even destroy the protected elements of cultural heritage.

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 and AN OVE programmes and ensure the provision of funds:

- for directing part of financial incentives to the introduction of energy performance contracting. This measure is planned within the framework of the ‘Sustainable consumption and generation of electricity and smart grids’ Priority Axis 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 pilot/demonstration projects. This measure is also planned within the framework of the ‘Sustainable consumption and generation of electricity and smart grids’ Priority Axis 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 performance contracting.

Other measures to improve the state of buildings (sustainable renovation) will be carried out alongside energy renovation in accordance with the principles of due diligence and care.

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;
- 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 energy efficiency 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 and particularly central or core government buildings, to which such incentives have not yet been allocated.

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

- compliance with Directive 2010/31/EC for nearly zero-energy buildings (new construction may, under certain conditions, also be considered to be compliance with the obligation to renovate 3 % of central or core government buildings);
- the upgrading of regulations to reduce 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.

## 1.5 Legislation, Regulation

Main Slovenian energy legislation affecting buildings:

- The long-term strategy to promote investments in energy refurbishment (DSEPS - Dolgoročna strategija za spodbujanje naložb energetske prenove),
- Regulations on energy efficiency in buildings PURES-2 2010 (Pravilnik o učinkoviti rabi energije v stavbah PURES-2 2010),
- National Energy Efficiency Action Plan for the period 2014 - 2020 (Akcijski načrt za energetska učinkovitost za obdobje 2014 – 2020),
- Guidelines for the implementation of measures to improve the energy efficiency of buildings in the public sector according to the principle of energy contracting (Smernice za izvajanje ukrepov izboljšanja energetske učinkovitosti v stavbah javnega sektorja po principu energetskega pogodbeništva),
- Law on Public-Private Partnership (Zakon o javno-zasebnem partnerstvu - ZJZP),
- Decree on the uniform methodology for the preparation and treatment of investment documentation in the field of public finances (Uredba o enotni metodologiji za pripravo in obravnavo investicijske dokumentacije na področju javnih finance),
- Operational Programme for the Implementation of the EU Cohesion Policy in the Period 2014-2020 (Operativni program za izvajanje evropske kohezijske politike v obdobju 2014–2020),

- Work instructions for intermediary bodies and beneficiaries to measure the energy renovation of buildings of public sector (Navodila za delo posredniških organov in upravičencev pri ukrepu energetske prenove stavb javnega sektorja).

## 1.6 Financial Support and Instruments

The value of public funds necessary for implementing building related measures in the 2014–2020 period is estimated at EUR 430 million. A higher share of private funds will have to be included in the energy renovation of buildings. Financial inefficiencies will be removed so that significantly greater effects will be achieved with fewer subsidies than was the case in previous periods. Leverage – ratio between the value of the subsidy and the promoted investment will be improved in the public sector from the current 1: 1.19 to 1: 3 by 2020. The effectiveness and effects of public finances will be increased through the promotion of energy performance contracting, activities to acquire funds from international financial institutions and promotion of the provision of green loans. It is envisaged that 25 % of all financial support for the energy renovation of public buildings will be directed towards promoting energy performance contracting in 2015, with this figure rising to 80 % by 2020. The planned public sources of financing are:

- funds from the contribution for raising energy efficiency;
- climate fund resources;
- EU structural and investment funds;
- other sources under the legislation in force (funds from the surcharge on the price of heating fuels).

The key sources of grants for the implementation of measures are:

- EU structural and investment funds for the implementation of European cohesion policy in the 2014–2020 financial perspective. The government has adopted the Operational Programme for the Implementation of European Cohesion Policy 2014-2020 (OP EKP). This is an implementing document based on the national strategies, schemes and action plans from individual areas, including energy efficiency targets. The programme defines those priority investments in which Slovenia will invest European cohesion policy funds in the 2014–2020 programming period with the aim of achieving the national and EU 2020 targets. The single Operational Programme for the Utilisation of All Three European Cohesion Policy Funds (European Regional Development Fund, European Social Fund and Cohesion Fund) will be applied for the 2014–2020 period;
- budget funds for ensuring Slovenian participation in the implementation of European cohesion policy;
- contributions or surcharges paid by energy consumers pursuant to the EZ-1;
- funds from the Climate Change Fund of the Republic of Slovenia, which are dedicated budget funds, while the income of the fund is income from the sale of emission allowances at auction, which is dependent on the market price of emission allowances on the European market. A portion of these funds is intended for energy efficiency measures;
- funds from other EU programmes in the 2014–2020 financial perspective are directed towards meeting the targets of the climate and energy package and, to a large degree, to the area of energy efficiency. These are the following programmes in particular: Horizont 2020 (framework EU research and innovation programme), the LIFE Programme for the environment and climate action, territorial cooperation programmes financed by the

European Regional Development Fund, Rural Development Programme of the Republic of Slovenia 2014–2020, etc. Individual projects within these programmes are implemented by different entities in Slovenia.

Investments in the public sector will also be financed from private sources and a full start-up of the energy performance contracting mechanism planned. The above-mentioned public finance resources will therefore achieve a greater impact. Energy performance contracting is currently only being implemented through individual projects. As part of the ‘Sustainable energy’ priority investment within the OP EKP, and in order to achieve the greatest possible impact and provide the greatest possible leverage, the energy performance contracting system (contractual energy supply and contractual provision of energy savings) will be developed horizontal, chiefly in the public sector (where justified) and in the household sector chiefly through demonstration projects. Plans have been made for the development of a legal and institutional framework and the development and establishment of a financial scheme that encourages the involvement of commercial banks in the financing of these types of public-private partnership projects. The involvement of the ministry responsible for finance will be crucial in this regard. Public funds totalling EUR 771 million (Table 1) have been set aside for incentives for EE measures that will enable implementation of the planned measures and achievement of the target set of raising energy efficiency by 2020. EE measures will, in addition to the national target of raising energy efficiency, also bring significant external benefits resulting from synergies with other energy and environmental policy targets (mitigation of the effects of climate change, improvements to air quality and increasing the share of renewable energy sources, increasing the competitiveness and security of supply of energy) and with the state’s development targets (employment, economic growth and an exit from the economic crisis).

EUR millions	2016	2017	2018	2019	2020	TOTAL
<b>EU funds and national budget – buildings</b>	35,6	36,2	36,8	37,5	38,1	<b>184,2</b>
<b>EU funds and national budget – smart grids</b>	4,3	4,3	4,3	4,3	4,3	<b>21,5</b>
<b>EU funds and national budget – other measures (air quality measures)</b>	1	1	1	1,1	1,1	<b>5,2</b>
<b>EU funds and national budget – EE in the industrial and service sectors</b>	34,6	34,6	34,6	34,6	34,6	<b>173</b>
<b>Climate fund</b>	12,8	16	16	16	16	<b>76,8</b>
<b>EE contribution</b>	38	37,4	38,3	38	38	<b>189,7</b>
<b>Total – guaranteed sources of public funds</b>	<b>126,3</b>	<b>129,5</b>	<b>131</b>	<b>131,5</b>	<b>132,1</b>	<b>650,4</b>
<b>Other funds contributing to EE</b>						<b>0</b>
<b>EU funds and national budget – transport</b>	37,2	37,9	38,5	39,2	39,8	<b>192,6</b>

Table 5: Sources of public funds for the financing of AN URE 2020 measures by area (Source: National Energy Efficiency Action Plan for the period 2014 – 2020)

## 1.7 Construction and Buildings Market Brief Description

In 2015 4,268 buildings were completed in Slovenia, which is 27% more than in 2014. 7,979 buildings were still under construction, 72% of them residential and 28% non-residential. The total floor area of completed buildings was more than 1.1 million square metres, which is 7% less than the total floor area of buildings completed in 2014. The growth in the number of completed buildings was influenced by the number of non-complex buildings, which we started to monitor in 2015. These are smaller buildings (e.g. garages, sheds, huts, etc.), which are classified under non-residential buildings and are usually built by natural persons. In 2015 around 1,000 non-complex buildings were completed.

In 2015, 57% of all completed buildings were residential and 43% were non-residential. Compared to 2014, the number of completed residential buildings decreased by 2% and the floor area of these buildings decreased by 11%. The number of completed non-residential buildings increased by more than 100%, mainly due to the completed non-complex buildings, while the floor area of these buildings decreased by 2%.

As regards floor area, natural persons invested more than legal persons

In 2015, natural persons completed 3,775 buildings (including also non-complex buildings, which is reflected in the higher number of buildings completed by natural persons) with 791,163 square metres of floor area, while legal persons completed 493 buildings with the total floor area of 335,494 square metres. As regards floor area, natural persons invested 3% more and legal persons 25% less than in 2014. As expected, natural persons invested mostly in residential buildings (71% of floor area), of which mostly in one-dwelling buildings (96% of floor area). On the other hand, legal persons invested mostly in non-residential buildings (83% of floor area). Among investments in non-residential buildings, the majority was invested in industrial buildings and warehouses (63% of floor area), followed by investments in public entertainment, education, hospital or institutional care buildings (16% of floor area).

	2014		2015	
	number	m <sup>2</sup>	number	m <sup>2</sup>
<b>Total</b>	<b>3.351</b>	<b>1.215.470</b>	<b>4.268</b>	<b>1.126.657</b>
Residential buildings	2.496	692.767	2.437	615.844
<i>one-dwelling buildings</i>	2.377	593.356	2.334	561.936
<i>two- and more-dwelling buildings</i>	109	80.935	96	48.087
<i>residences for communities</i>	10	18.476	7	5.821
Non-residential buildings	855	522.703	1.831	510.813

Table 6: Buildings completed, Slovenia, 2014–2015 (Source: SURS)

### List of companies

No.	Company	Total revenues € million	Net profit € million	Number of employees
1	Petrol, d. d., Ljubljana	3.114	30,1	1.234
2	Gen-I, d. o. o., Krško	1.791	8,1	178
4	HSE, d. o. o., Ljubljana	1.331	-323,1	129

12	Geoplin, d. o. o., Ljubljana	404	6,6	38
17	Elektro Energija, d. o. o., Ljubljana	361	2,2	76
40	NEK, d. o. o., Krško	177	0,0	647
41	Gen d. o. o., Krško	176	12,8	49
46	TEŠ, d. o. o., Šoštanj	162	-459,0	405
47	Eles, d. o. o., Ljubljana	153	10,0	526
56	Energetika Ljubljana, d. o. o., Ljubljana	130	5,2	582
65	Knauf Insulation, d. o. o., Škofja Loka	106	8,8	421
68	Premogovnik Velenje, d. d., Velenje	104	-66,0	1.254
69	SGP Pomgrad d. d., Murska Sobota	104	3,1	385
70	Elektro Ljubljana, d. d., Ljubljana	103	12,2	836
72	GH Holding, d. d., Ljubljana	101	14,9	16
75	Riko, d. o. o., Ljubljana	98	3,9	117
79	Gorenjska gradbena družba, d. d., Kranj	94	3,1	305
81	Energija plus, d. o. o., Maribor	93	1,3	67
82	CGP, d. d., Novo mesto	92	4,7	117
88	Trimo, d. d., Trebnje	87	2,7	337
89	CPG, d. d., Nova Gorica	87	3,5	404
92	Petrol Energetika, d. o. o., Ravne na Koroškem	86	2,8	128
96	Elektro Maribor, d. o. o., Maribor	85	11,3	831

Table 7: List of energy producing and energy related companies between top 100 Slovenian companies by total revenue in 2015 (Source: [www.delo.si](http://www.delo.si))

### Chamber of Construction and Building Materials Industry of Slovenia

Chamber of Construction and Building Materials Industry of Slovenia (CCBMIS) is a professional industry branch association (private non-profit organization) organised within the framework of CCIS ([www.gzs.si](http://www.gzs.si)). Its main mission, in the best interest of the Association's members, is to take positions and propose policies relating to the social partners, legislative and government institutions as well as towards their domestic and international associations. The Association assists its members by disseminating different sectoral information and data, providing various consultations, legislation questions, business opportunities, organising training, as well as by representing and communicating their proposals. Its tasks are performed within the system of statutory authorisations vested in the Chamber in accordance with the relevant legislation. The Association collects different statistical sectoral data and prepares different sectoral expert publications. CCIS is actively involved in many types of EU programmes, different calls and topics. Till now, we have cooperated with many different partners and successfully finished EU project themes. Construction and Building Materials Association is a member of FIEC (European Construction Industry Federation). CCBMIS was founded in 1952 and represent ca. 300 member companies and organizations (biggest construction companies, enterprises and construction institutes). CCBMIS takes positions and proposes policies relating to the position of the branch, to the sectoral social partners, to the legislative and government institutions as

well as towards their domestic and international associations, promoting good sectoral practices, national social partner – employers’ organization.

### 1.8 Professional Characterization (Labour)

According to the ESS, the most sought-after professions in the Slovenian construction industry are as follows:

- 9313.01 building workers for simple works,
- 7112.01 mason,
- 9312.01 worker at civil engineering simple works,
- 7115.01 carpenter,
- 7412.02 electrical fitter,
- 7214.01 installer of metal structures,
- 7131.01 decorator,
- 7411.01 electrician,
- 8342.01 manager of engineering construction machinery,
- 7212.01 welder.

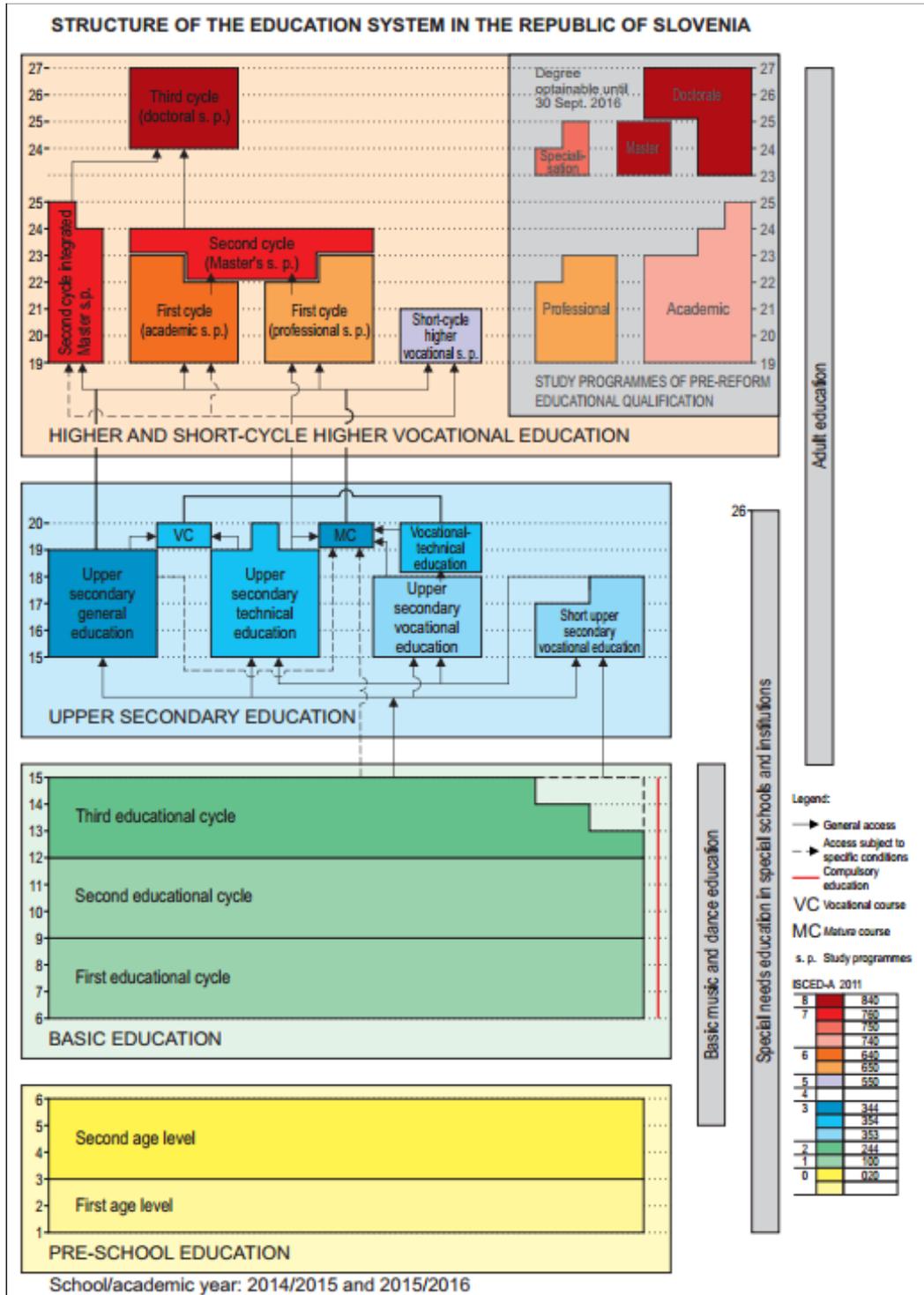
Temporary dynamics of the training needs for staff to implement nZEBs in Slovenia are shown in the table and in the diagrams below.

Year	2016	2017	2018	2019	2020
Annual training needs of existing workers	2.180	2.300	2.420	2.540	2.660
Annual training needs of workers from abroad (new ones from ex YU and Bosnia and Herzegovina)	1.500	1.500	1.500	1.500	1.500
Annual training needs - workers from other sectors and from other employers – new ones in sector	360	360	360	360	360
Annual training needs of young people with initial vocational education - additional training	1.050	1.100	1.150	1.200	1.250
<b>Annual training needs</b>	<b>5.090</b>	<b>5.260</b>	<b>5.430</b>	<b>5.600</b>	<b>5.770</b>
Trained in the existing forms of non-formal learning	3.600	3.100	1.980	1.600	1.200
Trained in the upgraded curricula of initial vocational education and training	500	800	1.150	1.200	1.250
Trained in accredited form of additional training for nZEB	990	1.360	230	2.800	3.320
<b>Trained per year</b>	<b>5.090</b>	<b>5.260</b>	<b>3.360</b>	<b>5.600</b>	<b>5.770</b>
Deficit - incomplete or inadequate training programs	-	-	-	-	-

Table 8: Estimated annual number of training needs for craftsmen and on-site workers in nZEB. (Source: BUILD UP Skills – Slovenia, May 2013)

### Structure of qualifications in the field nZEB

Professional standards are classified into eight broad sections based on the International Standard Classification of Education (ISCED), further subdivided into sub-groups. Inside the classification of professional standards into various the group it is difficult to put a professional standard in one single area. Professions are increasingly becoming interdisciplinary.



Graphicon 6: Slovenian higher education (Source: [www.studyinslovenia.si](http://www.studyinslovenia.si))

In the field of constructing nZEB, energy recovery and energy recovery and energy efficiency, a combination of multiple disciplines are encountered, which is why the aforementioned problem is even greater. In addition to traditional occupations, new occupations have also emerged.

The field of energy-efficient construction and energy rehabilitation of buildings in Slovenia was not addressed uniformly. It appears therefore in educational programs as a multidisciplinary field. It falls into the professional field of engineering, mechanical engineering, electrical and woodwork.

If the structure of qualifications is to be designed for the field of constructing nZEB, energy recovery buildings and energy efficient buildings, then the cross-sectional pre-existing content qualifications structures based on traditional division need to be connected together. The ISCED classification is mapped to the newly formed structure of qualifications, we connecting to building, rebuilding and efficient use of energy.

### **Professional standards**

Professional standard is a document containing generic and key competencies, typical work, knowledge and skills characteristic of a particular vocation. It is the basis for the preparation of educational program or NVQs. The decision is adopted by the responsible sectorial committee, taking account of the proposal submitted by the vocational standard proposer.

When surveying the Occupational Standards Database, the following occupational standards related to energy-efficient construction and energy saving building restoration were encountered:

**Professional standards at exigency level IV:** Bricklayer, Carpenter, Insulation installer, Floor layers, Painter, Tiler, Roof plumber, Joiner, Glazier, Fitter of ventilation and air conditioning equipment, Fitter of mechanical installers, Fitter of intelligent installations, Electrician, Electronics technician.

**Occupational standards at exigency Level V:** Construction technician, Operator of automatic compounds, Systemic electrician, Operator of energy equipment and systems, Wood technologist, Master craftsman's certification examination in individual areas of expertise, Construction foreman.

**The level of secondary vocational education** in which, education programmes last three years: Bricklayer Carpentry, Prefabricated builder, Mechanical installations fitter, Electrician, Joining, Tiling – setter of ceramic claddings, Roof plumbing, Painter, Glazier, Chimney sweeping.

**The level of technical education** in which education programmes take four years with vocational and technical education, taking an two additional years and are attended by the students who have successfully completed the secondary vocational education: are listed below. These courses require candidates who have successfully completed secondary vocational education: Construction technician, Mechanical technician, Electrical technician, Wood technician.

**Master craftsmen and foremen exams** (secondary technical education level): Master mechanical, Master glaziers, Master electrical fitter, Master mason, Master painter, Master plumbers, Master tiler, Master woodwork joiner, Stone master, Master tiler setter of ceramic claddings, Master chimney sweep, Master Foreman and Construction.

## 1.9 Preliminary Best Practices

Best practices that are described in detail in Good practice fiche:

1. ENSVET - Energy Advices for Citizens
  - Program for the free energy advice for citizens - Network ENSVET offers individual, free, independent energy consulting and information education and awareness activities for the promotion of energy efficiency measures and renewable energy sources for citizens in the local environment.
2. Eco Fund, Slovenian Environmental Public Fund
  - Eco Fund is a public fund (owned by the state) specialized in providing financial incentives for environmental investments. Established in 1993, following the example of EU member states leading in sustainable development and green technologies, as one of public mechanisms for environmental policy enforcement.
3. Combating energy poverty
  - Students carried out their yearly practice in the form of energy advices.
4. Complete renovation of apartment buildings - System Dominum
  - Idea is to solve problems with of apartment buildings from the 50s and 60s of last century. Solution of these problems could be extending the block (an increase in existing housing) or/and increasing the block (the addition of new dwellings).
5. Community of Preddvor – Kindergarten Storžek
  - Kindergarten energy class B1 with estimated positive net energy production 40.000 kWh (PV).
6. CHP Planina – Kranj
  - Neighbourhood Planina in Kranj had in mid-March 2012 officially handed over completely renovated boiler room, modern way of producing energy, with increased energy efficiency of existing energy source and offering cheaper heating for residents.
7. Education "European Energy Manager - EUREM"
  - In Slovenia was the first education EUREM organized within the project EUREM.NET in 2008. Slovenia conducted 8 trainings of EUREM, which successfully completed 176 European energy managers.
8. Contractual partnership in the building of Municipality of Kranj
  - Due to improvements in building of City Municipality of Kranj convenience of the users of the building in winter and summer is increased. Energy demand for heating and cooling was reduced with cogeneration of heat and electricity and also by 30 kWp photovoltaic power plant placed on the roof of the building.

## 1.10 References

### Documents:

- The long-term strategy to promote investments in energy refurbishment,
- National Energy Efficiency Action Plan for the period 2014 - 2020,
- Operational Programme for the Implementation of the EU Cohesion Policy in the Period 2014-2020,
- Work instructions for intermediary bodies and beneficiaries to measure the energy renovation of buildings of public sector.

### EU projects:

- BUILD UP Skills Slovenia ([www.buildupskills.si](http://www.buildupskills.si)),
- BUILD UPON ([www.buildupon.eu](http://www.buildupon.eu)),
- REACH ([www.reach-energy.eu](http://www.reach-energy.eu)).

### Websites:

- [www.agen-rs.si](http://www.agen-rs.si) (national regulatory authority of the Republic of Slovenia),
- [www.constructionindustry.gzs.si](http://www.constructionindustry.gzs.si) (Chamber of Construction and Building Materials Industry of Slovenia),
- [www.ekosklad.si](http://www.ekosklad.si) (government),
- [www.energetika-portal.si](http://www.energetika-portal.si) (government),
- [www.energetika.net](http://www.energetika.net) (online energy news),
- [www.focus.si](http://www.focus.si) (association for sustainable development is independent, non-governmental, non-profit and apolitical association of individuals),
- [www.gi-zrmk.si](http://www.gi-zrmk.si) (Building and Civil Engineering Institute),
- [www.petrol.si](http://www.petrol.si) (leading Slovenian energy company),
- [www.stat.si](http://www.stat.si) (statistical office),
- [www.trajnostnaenergija.si](http://www.trajnostnaenergija.si) (Slovenian power market operator),
- [www.zzgs.si](http://www.zzgs.si) (Slovenian Chamber of Construction).

## 2 SWOT Analysis

Slovenian stakeholder group has been drafted on the 8.<sup>th</sup> of September. For each of four topics we decided to appoint one representative who has the most knowledge about the topic and who would lead the discussion.

### Representatives by the topic:

- Professionalization of the construction sector
  - Mrs. Marjana Šijanec Zavrl, PhD., ZRMK d.o.o. Building and Civil Engineering Institute
- Innovation
  - Mr. Aleš Podgornik, M.Sc., Jožef Stefan Institute/Energy Efficiency Centre
- Activation of demand and combating energy poverty
  - Mr. Tomislav Tkalec, PhD., Focus Association for Sustainable Development
- New financial instruments
  - Mr. Tilen Smolnikar, M.Sc., Ministry of Infrastructure/Energy directorate

## 2.1 Strengths

### **Professionalization of the construction sector**

- The quality of construction.
- Higher quality of performance.
- Improved quality of service.
- Specific solutions for specific problems.
- Faster progress.
- Cost reduction.
- More jobs.
- New working skills.
- More training opportunities for workers.

### **Innovation**

- Do not be the last.
- Greater added value.
- Boosting the economy.
- Positive atmosphere.
- Mobilising knowledge in Slovenia.
- Develop mechanisms and the introduction of new technologies.
- Technological development.
- Specialization in construction.
- Achievement of target performance of buildings after the renovation.
- Better quality of construction.
- Longer-term job creation.
- Possibility of continuous innovations.
- More cost savings for less € - in the long term.
- Better European projects -> better (cheaper) measures and better quality.
- Possible major impacts / energy savings.
- Introduction of integrated solutions.
- Possibility of integration into existing calls by the government.

### **Activation of demand and combating energy poverty**

- Maintaining social peace.
- Less cost for the state in future.
- Pilot projects on which we could refer.
- An analysis and a set of proposals for structural and political measures.
- By addressing the energy poverty the housing stock which will be renovated, will increase.
- Preservation of the building stock.
- Better quality of life, if it helps at-risk groups of the population.
- Better living conditions.
- Reduction of energy consumption.
- Correct thinking energy companies to invest in the Negawatt.
- Combating energy poverty is a key step to change the situation.
- Programs to reduce energy poverty are remunerated.
- Reducing energy poverty.
- Tackling fuel poverty as a social correction.

- Knowledge of availability of foundations, approaches, initiatives for the development and on the energy field.

#### **New financial instruments**

- With new financial instruments we will achieve our goals easier (building refurbishment, better energy efficiency).
- We'll have more energy efficient buildings than we would have without financial investments.
- Boost of economy (building sector).
- The possibility to finance the energy rehabilitation with a longer payback period.
- Continuing of investments, despite the reduction in subsidies.
- Less risk in investment.
- Entry of the private capital.
- Improving energy efficiency in buildings.
- Reduced energy consumption means savings in cash.
- Reducing CO2 emissions.
- Greater choice.
- For different social classes.
- Extension of the construction features of buildings.
- Significantly improved visual appearance of buildings, neighbourhoods and entire districts.
- Improving living conditions.

## **2.2 Weaknesses**

#### **Professionalization of the construction sector**

- Interactions with multiple providers -> tighter control.
- Currently, too much dependant from subsidies.
- Public procurement, construction law, calls don't include energy expert (not thinking the supervisor which is required by law).
- Lack of support for the development activities of companies-operators according to market principles.
- Market construction with a high turnover of workers.
- Knowledge gap in the school system.
- Lack of knowledge.
- More training needed and supervising.

#### **Innovation**

- Waiting for others.
- Lengthy procedures.
- Slow introductions.
- Poor implementation of new technological solutions in Slovenia.
- Lack of testing at the beginning of the investment.
- Lack of tenders that encourage innovation.
- Some of the stakeholders will be reluctant to participate.
- High investment costs.
- Costs of innovative solutions are too high.

- Processes in construction are rigid.
- We do not have enough pilot solutions.
- Lack of good practices.
- We do not monitor the effects of innovation installed in the building.
- There is no feedback.
- Currently only few companies.
- Lack of innovation knowledge.

#### **Activation of demand and combating energy poverty**

- Complex approach.
- Financial uninteresting.
- Lack of resources.
- Requirement of combining multiple sources.
- There is no interest at energy suppliers.
- There is sufficient interest at the national level.
- No interest at owners for renovation.
- Lack of awareness of social actors about the problems.
- Problems of the building refurbishment where the poorer residents lives.
- Certain people are unwilling to give the permission.
- Helping the poorer on the area of energy rehabilitation.
- At the national level, energy poverty has not yet been identified.
- There is no program to at the national level.
- There is no systemic approach (no definition of energy poverty; no extensive programs to reduce the problem).
- No clear models when it comes to linking key institutions in the field of energy literacy.
- Undeveloped models
- Working with new or unfamiliar technology, how to successfully renovate the building.
- Inexperience approaches.
- Bad living conditions.
- Threats to health.
- Stigma of applicants entitled to 100% subsidy.
- Unfamiliarity of the fields by the competent authorities, which should be included.
- Poor energy literacy.
- Energy literacy is not included in the preparation of local energy concepts and approaches to resolving it.
- Not enough people are informed.

#### **New financial instruments**

- New financial instruments will be developed in the year 2017.
- Inadequate response of state authorities.
- Process of establishing new financial instruments is too bureaucratic.
- Excessively long procedures, bureaucracy.
- Lack of interest in the introduction of new financial instruments.
- There is no confidence in the new financial instruments.
- Poor uptake of financial resources.
- Too few resources.
- Slow deployment.

- Undeveloped financial instruments.
- There is no experience with financial instruments.
- Lack of good practice.
- A small market.
- Poor integration of energy companies in the scheme.
- Selecting only measures which could be quickly repaid.
- Economic analysis often reveals non eligibility of investments.

## 2.3 Opportunities

### Professionalization of the construction sector

- The development of new sectors in the construction industry.
- Higher added value.
- Introduction of new technologies.
- Using new methods and materials.
- Introduction of RES and RUE.
- Information on developments in the building energy sector.
- Comprehensive approach.
- The severity of performers and higher quality.
- In the renovation of building, highlighting the role of energy expert, this is neither a constructor nor an engineer, because an interdisciplinary knowledge.
- Integrated energy planning throughout the life cycle.
- Engagement of experts.
- Energy consultants who monitor whole construction.
- Promotion + education.
- Training of staff.

### Innovation

- The inclusion of creative knowledge in Slovenia.
- New jobs.
- Higher added value.
- Cost reduction.
- European projects with good practices.
- Introduction of the results of EU projects.
- Newer materials.
- Development of new products.
- Collecting data on energy use for buildings and then the introduction of energy management.
- Integration of new technologies and services to energy suppliers through "smart grids".
- Smart measurements (real time monitoring).
- The calls that would require monitoring with clear rules.
- Introduction of new technologies.
- Integrated solutions.
- For the production of RES (business opportunities, improved energy performance of buildings).
- H2020, the SME instruments, smart specialization.
- New companies with new knowledge.

- Structured approaches guided by the government as a guide to local communities.

#### **Activation of demand and combating energy poverty**

- Increasing the overall impact of CO2 reduction.
- Poor households = poor building = big energy savings potential.
- To improve degraded areas.
- Raising standards and improving the living conditions.
- Reducing energy consumption with raising awareness.
- Helping to stimulate building sector.
- Developing innovative solutions and pilot projects, which would be suitable for implementation.
- Opportunity for owners of buildings to cooperate with distributors, construction companies.
- Synergies with solving other social problems.
- Reducing poverty.
- Improving housing conditions.
- Investing in the reduction of energy use instead into financial support for irrational consumption.
- Placing the renovation program in the action plans of the cities.
- Municipal bonds or other business models.
- Increased awareness of the problem, talks about easier decision for action.
- Identifying appropriate models that may be of interest to companies and energy operators in the country with a view to improving the quality of life and development.

#### **New financial instruments**

- Options for the renovation of public buildings will be increased with the establishment of new financial instruments.
- New opportunities for funding and boost of construction sector (energy renovation of buildings).
- Increase of investments.
- Integration with instruments in other countries.
- Integration and the adequacy.
- Mobilising domestic capital.
- Becoming more active in energy investment, not just waiting for calls.
- Integration at several levels (local, regional).
- Reducing energy consumption and costs.
- Creation of the platform of investment opportunities.
- Recruitment of experts.
- Creating new jobs.
- Development of new products.

## **2.4 Threats**

#### **Professionalization of the construction sector**

- Inconsistent of implementation from concept to construction.
- There is a lot of potential.
- The possibility of loss of work if the activity only relates to the subsidy scheme.

- Slowness in approach.
- Maintaining the classical principle of the construction process.
- The lowest price in the tender is decisive factor.
- Lack of staff due to the crisis in the construction industry.
- Supervisors are not trained for new approaches.

#### **Innovation**

- Not achieving goals.
- Lack of testing.
- Poor knowledge transfer from operators to users.
- Poor maintenance and unfamiliarity at the time of operation and therefore higher costs.
- Selection of the right data in the energy management.
- In case of transfer of good practices - errors due to different environment.
- Due to private interests (distributors, contractors ...) it may happen that the installation of new technologies is limited ...
- Unproved technology.
- Incomplete energy audits.
- The introduction of untested solutions can be an obstacle.
- Incompetent contractors - counteract the advantages of new technologies.
- Dumping from existing companies.

#### **Activation of demand and combating energy poverty**

- Poor response and distrust.
- Misuse of residents by business fraudsters.
- No action planned for narrowly targeted group (important is good definition of energy poverty).
- The inability of the inclusion of financial capital.
- Co-financing of ineligible stakeholders.
- Long and complicated procedures.
- Unrenovated buildings.
- A resident isn't the owner of a renovated apartment for which is required the achievement of energy savings. Resident isn't paying for energy costs.
- Despite the renovation there is an increased use of energy due to poor organizational measures.
- The passivity of consumers, if things do not appear complete.
- Funds do not reach all of the population, which would reduce energy poverty.
- Inadequate definition of the term energy poverty.
- Uncertainty, anxiety...
- Extremely deterioration in living conditions (health).

#### **New financial instruments**

- Due to delays in the preparation of (implementation) regulations it may lead to delays of projects.
- Lack of public-private partners.
- Incompetent and financially unstable companies, which reflects in the bankruptcy or uncompleted projects.
- Companies could create cartel for public-private partnerships and ESCO models.
- The dominance of capital.

- Lack of experience leads to poor management of resources.
- No interests in unprofitable projects.
- Only partial reconstruction.
- Focus only on projects with "profitable" savings.
- People, businesses and the public rely on the subsidies when they cease, the activities stop.
- Failure to provide their own part of participation.
- Proof that the project is not attractive for financial investors.
- Projects are not in compliance of the objectives in the field RES and RUE.

### 3 Needs

On basis of the state of art and SWOT analysis the main needs were identified as follows:

#### **Professionalization of the construction sector**

- Turnover of construction workers is too high.
- Lack of knowledge due to new technologies.
- Problem of dumping prices affects the quality of work.

#### **Innovation**

- There is a lack of public calls for support of innovation project.
- Laws and processes in adapting changes in laws are too rigid.
- There is a lack of good practices.
- Finding investors or financial models that would support high research and development costs.

#### **Activation of demand and combating energy poverty**

- There is no sufficient interest in tackling the problem of energy poverty.
- There is no definition for energy poverty in Slovenia.
- Developing financial models that would support investments in projects that are not interesting for capital.

#### **New financial instruments**

- There is a need for new financial instruments to boost economy and energy rehabilitation of buildings.
- Financial instruments should be adapted to the needs of different social classes.
- Processes should be shortened.
- Market should be more developed and open.
- New financial products should be developed.