BUILD UP Skills Slovenia

Analysis of the national status quo

December 2012

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Further information

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0 Executive summary

Slovenia has adopted a target to achieve a 1% annual energy savings or 9% in the period from 2008 to 2016 (NEEAP - National Action Plan for Energy Efficiency for Slovenia 2008-2016, in line with ESD directive (2006/32/ES)). Furthermore, a very ambitious target (binding by RES directive) - to achieve a 25% share of renewables in gross final energy use (19.8% in 2011 and 20.3% in 2012) by 2020 and 10% share of renewables in final energy consumption in transport, has been accepted (NREAP - National Renewable Energy Action Plan).

The draft National energy program (NEP 2030) is based on a number of operational objectives by 2030, i.e. improvement of energy efficiency to 20% by 2020 (27% by 2030), 25% share of RES in final energy consumption by 2020 (30% by 2030), reduction of GHG from fuel burning by 18% to 2030. The above targets assume gradual increase of the share of nearly zero energy buildings (nZEB) among new and renovated buildings by 100% in 2020 and in the public sector until 2018.

All the aforementioned targets and goals represent a significant challenge to the construction sector, particularly to the buildings field. These new boundary conditions imply necessary and swift transformation of the sector to be able to respond to strengthened demands. One of the most important tasks is to raise the level of skills and competences of the workforce for state-of-the-art implementation of nZEB practices.

However, the present situation is not advantageous. The fast growth of the construction sector lasting almost two decades ended in 2008, when collision of different internal, national and global problems led to a substantial downturn of the sector. Compared to 2008, when construction activity was at its peak, the value of construction put in place in 2011 was more than 50% lower. With regard to buildings the value dropped by almost 60%.

The graph below shows the Slovenian preliminary plan for nZEB on-site workers with regard to upgraded training schemes.

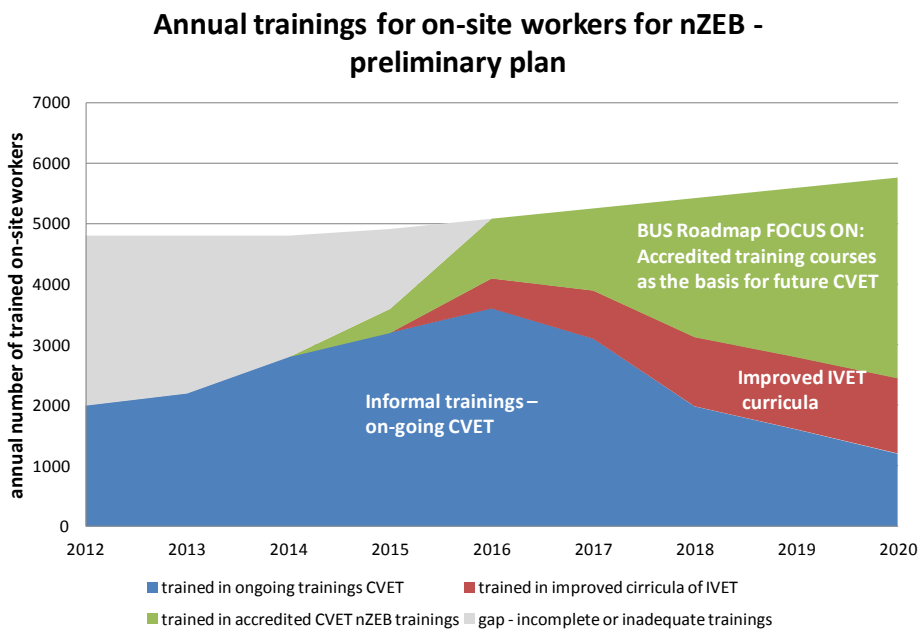


Figure 1: Annual trainings for on-site workers for nZEB

The number of employees has also been declining: in January 2012 it dropped by about 1.400 to 60.653 (compared to average number of 88.000 in 2008), more than half of whom (57.9%) performed specialized construction work. Employment in the construction sector accounts to around 8% of the total employment in Slovenia There are practically no large construction companies left, which has significantly altered the position of the sector within the national economy and its capability of realization of complex projects, and affected the structure of workers - also with respect to their actual qualifications.

Another visualization of the forecast training needs in the nZEB sector until 2020 is presented in Table 1

Table 1: Annual training needs in the nZEB sector

Year/persons	2012	2013	2014	2015	2016	2017	2018	2019	2020
annual training needs of existing workers	1950	1950	1950	2060	2180	2300	2420	2540	2660
annual training needs of new foreign workers (newcomers from ex YU, BiH)	1500	1500	1500	1500	1500	1500	1500	1500	1500
need training - new workers coming from other sectors (newcomers in the sector)	360	360	360	360	360	360	360	360	360
annual training needs from young workers with IVET - need additional training	1000	1000	1000	1000	1050	1100	1150	1200	1250
annual training needs	**4810**	**4810**	**4810**	**4920**	**5090**	**5260**	**5430**	**5600**	**5770**
trained in on-going trainings CVET	2000	2200	2800	3200	3600	3100	1980	1600	1200
trained in improved curricula of IVET					500	800	1150	1200	1250
trained in accredited CVET nZEB trainings				400	990	1360	2300	2800	3320
trained annually	**2000**	**2200**	**2800**	**3600**	**5090**	**5260**	**5430**	**5600**	**5770**
gap - incomplete or inadequate trainings	2810	2610	2010	1320	0	0	0	0	0

Young population in Slovenia has very low interest for enrolment in secondary vocational education and training (VET) programmes (STE - secondary technical education; VTE - vocational technical education; SVE - secondary vocational education). A constant drop of enrolment was identified from 15.8% population in 2007/2008 to 11.7% in the year 2011/2012. This drop is particularly noticeable in occupations of construction sector (only 4 bricklayers and 6 carpenters started the initial education in 2011) while the enrolment in the programmes of mechanical technician and fitter of mechanical installations dropped only moderately. The upgrade of curricula in initial VET is important but it cannot have a major impact on improvement of EE competences of blue collar workers that are on the labour market.

To summarize, the objectives of the Build Up Skills Slovenia are based on the following presumptions and facts:

- the national strategies in the building sector are aimed at meeting the EU energy efficiency, RES and emissions targets 20-20-20 by 2020;
- current vocational qualification system is not shaped i.e. does not provide all necessary content according to emerging needs;
- therefore present skills and competences of the building workforce to a large extent do not satisfy the demands of nearly zero-energy construction practice;
- the construction sector capacity needs upgrading to be able to tackle new challenges;

- a vital part of this transformation must be secured via provision of further training of workers, offering specific energy efficiency-related skills and increasing the number of competent workforce;
- to achieve this a firm cooperation of specific sectorial national stakeholders is needed, using the findings of the status quo report to conceive a solid roadmap with national situation-relevant specification of training needs, content, targets and time framework.

The primary objective of the Build Up Skills Slovenia project is to define the national framework for upgrading the existing skills and for development of new qualification schemes for new, appropriately skilled workers to achieve Targets 2020.

The wider overall aims of the project are thus to:

- directly or primarily: increase the number of construction workers with modern skills related to energy efficient construction practice;
- indirectly or secondarily: support the construction sector in meeting the national goals and improving its status in the national economy framework.

The analysis has shown that existing needs, irrespective of the current construction activities' intensity and volume, to a noticeable extent surpass the level of service the workers are capable of providing. As expected this is connected to their skills and competences related mainly to the education/training schemes available. Development of construction materials and technologies, and increased energy efficiency regulatory demands impose equivalent development of construction practice, with nZEB being no exception. As a consequence of firm strategies towards EE in buildings the number of qualified workers in the building sector shall be increased through learning and gaining qualifications.

The objectives traced in this document include identification of weak or missing features of present vocational education and training schemes in order to define priorities for their successful upgrade to be able to meet in practice national goals of increased energy efficiency and reduced environmental impact in the building sector. This report is also focused on the broader framework, i.e. on the national conditions in the building and construction sector, as these boundary conditions are essential for definition of training needs in the future roadmap.

Key education/training elements for the future are:

- construction of nZEB requires interdisciplinary approach with skilled workers being equipped with at least basic knowledge from other fields;
- focus shall be put on communication skills, knowledge of languages and information technologies;
- new practical training forms will be needed: on-site, working on concrete examples, short-term but repeated and continual, free of charge for own workforce;
- a complementary set up of informal training formats based on good training practice as supporting tools for other/existing education and training practices is highly appreciated by the relevant stakeholders;
- a certification system shall be established to evaluate informal training as a key segment of life-long learning;
- internal branch certificates are a recommended instrument for achieving better transparency of competences' proving procedures of nZEB workers;
- an integral quality assurance system for nZEB construction shall be set up, where based on commissioning the elements of quality will be defined for individual professions;

- a clear and elaborated overview of required competences is needed;
- construction industry shall be actively involved in the training process by executing acknowledged training programmes.

1 Introduction

Build Up Skills Slovenia is an Intelligent Energy Europe funded project related to skills and competences of workers in the construction sector with the aim to increase their levels to meet the needs and demands of modern energy efficient construction practice. The project is directly linked to actions oriented towards meeting energy efficiency of buildings targets both in the EU and national area. An upgraded level of information, knowledge and practical skills obtained through adapted education/training is needed to guarantee successful implementation of required state-of-the-art procedures.

The EU and national EE/RES targets of 2020 climate and energy policy have foreseen large contribution from construction sector. High energy performance retrofitting of existing buildings and nearly zero-energy buildings demand an intensive upgrade of existing skills of craftsmen and other on-site construction workers any systems' installers within continuous education/training, as well as an upgrade and/or new qualification schemes in the initial education.

The Build Up Skills project belongs to an EU-wide group of similar actions with the same common goal. There have been 30 national expert teams working on the subject from 2011 and 2012, respectively. Slovenia has joined within the first group of countries. The National Status Quo report has benefited from exchange of experience with Austria and Finland, enabling comparison of common points on one hand, and observation of particular national specific issues on the other hand.

The objectives of the Build Up Skills in Slovenia are based on the following presumptions and facts:

- the national strategies in the building sector are aimed at meeting the EU energy efficiency, RES and emissions targets 20-20-20 by 2020;
- current vocational qualification system is not shaped i.e. does not provide all necessary content according to emerging needs;
- therefore present skills and competences of the building workforce to a large extent do not satisfy the demands of nearly zero-energy construction practice;
- the construction sector capacity needs upgrading to be able to tackle new challenges;
- a vital part of this transformation must be secured via provision of further training of workers, offering specific energy efficiency-related skills and increasing the number of competent workforce;
- to achieve this cooperation of specific sectorial national stakeholders is needed, using the findings of the status quo report to conceive a solid roadmap with national situation-relevant specification of training needs, content, targets and time framework.

The wider overall aims of the project are thus to:

- directly or primarily: increase the number of construction workers with modern skills related to energy efficient construction practice;
- indirectly or secondarily: support the construction sector in meeting the national goals and improving its status in the national economy framework.

The expected results of the Build Up Skills Slovenia project are:

- Analysis of the national status quo (this document) to describe in detail the current situation and act as the common basis for informed discussions with the stakeholders about current gaps, future needs and necessary priorities.

- National qualification platform, initiated with support of 37 institutions: • relevant public authorities (3 ministries) • leading institutions in the continuing training system of the building sector • social partners (ZSSS, ZRSZ) • building industry and professional chambers • energy efficient building product/equipment industry and RES producers and installers • architects (ZAPS) • sustainable buildings experts (consultants, universities, ENSVET) • accreditation and certification
- National Roadmap - based on the national status quo analysis it will be tailored to national specifics in the field of continuing education and training in the construction sector. The roadmap will explain how to overcome barriers and identified skills gaps in such a way that the 2020 targets in the building sector can be met.
- Endorsement of the Roadmap - The roadmap endorsement is planned and implemented as a multi stage process with the aim to assure endorsements by relevant public and private authorities, institutions and stakeholders in construction sector and education/training field – including their commitment to carry out and implement proposed strategy and action plan.

The purpose of this national status report is to prepare a detailed analysis and presentation of the national situation in the field of initial education/training as well as in the field of lifelong learning of on-site workers involved in construction of new energy efficient and nearly zero-energy buildings and energy renovation of existing buildings.

Build Up Skills Slovenia project coordinator:

Building and Civil Engineering Institute ZRMK (ZRMK)

Partners:

Chamber of Craft and Small Business of Slovenia (OZS)

Construction Cluster of Slovenia (SGG)

Institute of the Republic of Slovenia for Vocational Education and Training (CPI)

School Centre Novo mesto (SCNM)

Slovenian Chamber of Engineers (IZS)

2 Objectives and methodology

This analysis of the national status quo provides the starting point and common background for the re-structuring and transformation of Slovenian training practices with regard to the needed skills, competences and qualifications of the construction sector workforce to successfully address the challenges of the energy efficiency targets by 2020. It is therefore aimed at investigation of the current state and definition of changes and improvements needed in the immediate future.

The report presents key characteristics of the building sector and its rises and downfalls through the last two decades, describes relevant national policies and strategies aimed at meeting the EU 2020 energy efficiency targets, shows main statistical indicators related to building and energy sectors, and discusses existing VET provisions versus exposed needs while also unveiling the identified obstacles on the path towards a general higher quality level of knowledge of workers tailored to modern requirements.

The training needs and gaps are governed by the national implementation of 2020 energy and policy, defined in European Directives (EPBD recast, ESD, RES) and transposed via national legislation and action plans (National energy efficiency action plan, National renewable energy action plan, National plan for nZEB). The national targets and corresponding support measures allow the detailed planning of the national sustainable buildings qualification roadmap.

The objectives traced in this document include identification of weak or missing features of present vocational education and training schemes in order to define priorities for their successful upgrade to be able to meet in practice national goals of increased energy efficiency and reduced environmental impact in the building sector.

This report is also focused on the broader framework, i.e. on the national conditions in the building and construction sector, as these boundary conditions are essential for definition of training needs in the future roadmap.

The objectives of this report can be summarized as:

- Comprehensive analysis of the building sector needs with respect to EE and RES technologies,
- Comprehensive analysis of the national system of continuing education, informal trainings, gaps and needs for training, trainers and quantified data for the need of skilled workers
- Draft Analysis of the national status quo consulted with market actors from the national platform
- Elaboration of the final Analysis of national status quo

This has been done by carefully evaluating the relation between the construction sector and the national economy, the anticipated volume of skilled workforce and trainers according to strategies and trends, the training content needing to be adapted to new levels of demand both from the energy efficiency and related technical points of view.

In order to execute the tasks the Build up Skills Slovenia consortium has established active and effective collaboration between construction industry, experts and companies involved in facilitation of nZEB concept and relevant technologies and vocational education and training organizations. Also, several international projects going on in Slovenia developing specific programmed for education and training approached the Build up Skills project in order to disseminate and potentially integrate the outputs of their projects in either educational curricula or in the informal training schemes.

The analysis requested considerable efforts to reasons of objective nature. Slovenian statistics in the building sector does not allow any detailed estimation of training needs and existing provision of courses and number of trained workers, nor the number of young workers with initial education entering the labour market, the number of the workers leaving the sectors or coming from other sector, or evidence of what happens with the foreign workers after the expiry of the working permit. Moreover, there is no central evidence about informal education established, and all big construction companies seized to exist, which used to take care of training of workforce.

For the purpose of data collection an extensive questionnaire was prepared and submitted to the stakeholders during the summer of 2012 in order to collect the information on the implemented informal trainings. In September 2012 the consortium partners made numerous telephone contacts with the informal training providers in building industry, which was followed by a detailed analysis of the estimated training needs and gaps, facilitated by an intense meeting schedule of partners in the last quarter of the year.

Additional input for the particular report chapters was collected within numerous working meetings with relevant stakeholders and at specific targeted workshops.

The work was distributed among the six partners of the national consortium according to their expertise:

- ZRMK – Building and Civil Engineering Institute ZRMK, was responsible for the sector of energy efficiency and RES in buildings, for the overview of the national policy in respect to 20-20-20 by 2020 targets, Directives EPBD Recast, RES, ESD, draft EE directive and respective strategic documents and legislation related to EE and integration of RES in buildings, for the assessment of EE renovation works, training needs and gaps. ZRMK was also responsible for the compilation of Status Quo report.
- CCS – Construction Cluster of Slovenia – was responsible for the analysis of the situation in building and construction sector, for identification of barriers and gaps, as well as for the organisation of the operation of the national qualification platform and identification of the relevant stakeholders in Slovenia. CCS was also responsible to collect the information on social and psychological concerns related to training of adult persons (external expert SIAE).
- OZS –Chamber for Crafts and Small Business of Slovenia – was responsible for the analysis of the current workforce (craftsmen and system installers) and blue- collar workers in construction sector. The chamber also collected the information on on-going informal trainings via its professional sessions. In the annual meetings of the sessions (builders, roofers, system installers), OZS also used the polls to collect the craftsmen opinion on the training needs and interest.
- IZS – Slovenian Chamber of Engineers – was responsible to identify the frequent mistakes occurring on the construction site due inadequate skills of blue collar workers working on construction of very low energy buildings. In addition IZS also established many contacts with contractors, producers of building components, systems and technologies for the use of RES in buildings, to collect the data about informal training.
- SCNM – School centre Novo mesto – was responsible for the preparation of the analysis of the secondary-technical and vocational education in Slovenia, for the detailed overview of the existing curricula (and knowledge catalogues) for STE - secondary technical education, PTE - vocational technical education, SVE - secondary vocational education and LVE - lower vocational education in the field of building and construction sector, mechanical engineering and electrical engineering in order to identify the amount of EE and RES related modules in existing knowledge catalogues. SCNM cooperated in this analysis with external experts – teachers form other schools.

- CPI - Institute of the Republic of Slovenia for Vocational Education and Training – was responsible for the analysis of the policies and strategies related to green jobs, energy efficient building and energy renovation in Slovenia by 2002. CPI focused on existing education system in Slovenia and on lifelong learning for specialized knowledge and skills; moreover it was responsible for the presentation of the overall overview of system framework and available mechanisms, including the national professional qualifications and Slovenian Qualification Framework. CPI was also responsible for the analysis of EE and RES topics in occupational standards, the selection of occupations related to construction of energy efficient buildings and for the overview of the related status on the labour market.

3 Characterisation of the building sector

3.1 Historic background

The construction sector in Slovenia played an important role in post-WW II country development. It provided all needed infrastructure from small private houses to large hydro, thermal and nuclear power plants, highways and other buildings and engineering infrastructure with own engineers, technicians, workers, knowledge and technologies. Many of technologies used ware developed in Slovenian R&D institutes. The skills, experiences, and capabilities of the sector were generally on a high level.

The fall of Yugoslavia and loss of its market brought huge challenges to construction companies, many of them facing downsizing and collapse in years 1990 and 1991. On the other hand the sector faced huge new needs, including renovation and reconstruction of existing building stock. Beside the large construction contractors being able to design and build all type of buildings and civil engineering structures, and small economic entities in the crafts sector, a large number of SMEs have been established, able to develop, transfer and implement almost all up-to-date system and technologies, including the technologies in the field of sustainable building. The Slovenia`s accession to the EU and the adoption of the Euro contributed to investments and intensive exploitation of the European structural funds.

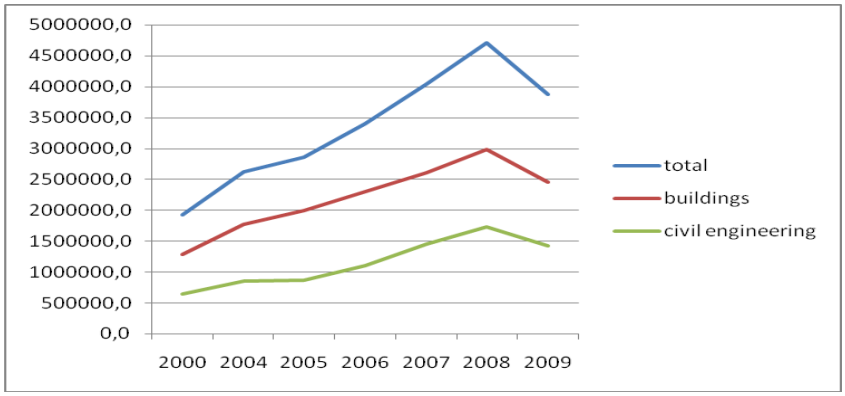


Figure 2: Value of construction put in place in Slovenia (Current prices, According to the Classification of Type of Construction (CC – SI), in 000 EUR). Source: Statistical Office of the Republic of Slovenia, Statistical yearbook 2011, www.stat.si

3.2 Immediate past and current status

The fast growth lasting almost two decades ended in 2008, when collision of different internal, national and global problems led to a substantial downturn of the sector. Compared to 2008, when construction activity was at its peak, the value of construction put in place in 2011 was more than 50% lower. With regard to buildings the value dropped by almost 60% and to civil engineering by 45%.

Two important characteristics can be observed in the construction sector:

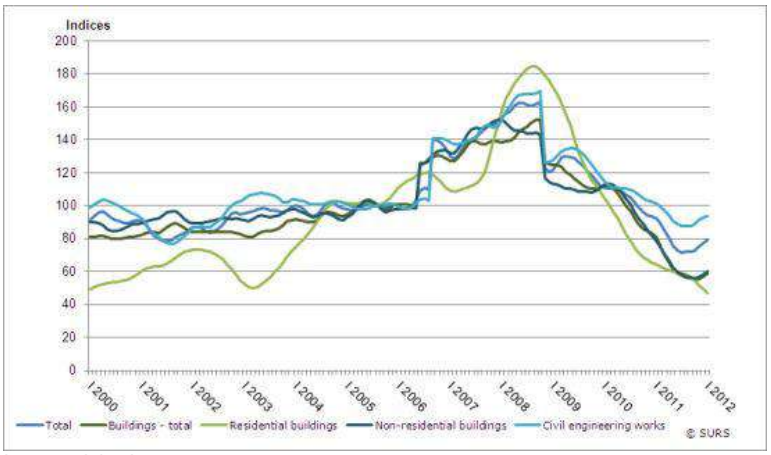
- Lower value added in construction

With the decline in the value of construction put in place, the value added in construction is also declining. In the fourth quarter of 2011 the value added was 15.5% lower than in the fourth quarter of 2010, producing a negative impact on GDP growth.

- The number of persons employed in construction continues to fall

The number of employees is also declining: in January 2012 it dropped by about 1.400 to 60.653 (compared to average number of 88.000 in 2008), more than half of whom (57.9%) performed specialised construction work.

The main internal problems of the sector were and to some extent still remain the privatisation and management-by-outs of medium and large enterprises, low awareness regarding the market downturn and some other risks. Because of the fast growth in the past there was a low organisational and technological flexibility to adapt to the changes and challenges. As a consequence, the companies (also negatively stimulated by investors) adopted the lowest bid as the standard competition practice, which brought financial issues related to late or even non-payments of the subcontractors and suppliers.



Source: SORS

Figure 3: Trends in construction activity, Slovenia, 2000-2012

In January 2012 the value of construction put in place in the EU-27 was 4.1% lower than in December 2011. Although at the monthly level the growth in the value of construction put in place was the largest in Slovenia (by 17.4%), at the annual level (compared to January 2011) Slovenia recorded the greatest drop (-19.7%).

3.3 Trends and prospects

Statistics shows no good prospect for the near future observing the number of building permits issued and the confidence indicator. The number of building permits issued has been decreasing since 2007; in 2010, 14.6% less permits than in 2009 were issued, and in 2011 6.8% less than in 2010. In recent years, most building permits were issued in 2006, 6.376 or 43.0% more than in 2011. In 2011, 3.635 building permits were issued, of which 2.633 (72.4%) for residential buildings, the investors of which were mostly natural persons (88.5%). This is in line with the national statistics showing that around 92% of residential buildings or apartments are owned privately. Still, many larger investments are ready for implementation and many companies are doing serious activities in the R&D of new technologies and services for the demanding foreign markets.

Data on new contracts and building permits issued in 2010 and 2011 show that the value of construction of residential buildings will continue to decrease, while the value of construction of non-residential buildings will stay at about the same level. On the basis of available data on new contracts for civil engineering no noticeable growth is expected in the very near future.

3.4 Geographic and climatic characteristics

Although small in size, Slovenia is characterised by a large variety of geographical and climatic conditions, lying on the crossroads of Alpine, Pannonian and Mediterranean influences. This affects

also the construction sector, needing to adapt to different boundary conditions with regard to individual locations. These boundary conditions may come in the shape of different peak high and low temperatures and their seasonal fluctuations, degree days, insolation levels, precipitations and wind, influencing the needs and regional specifics of (energy efficient) construction.

Not only the building characteristics defined by – among other features - heating and cooling demand but also the construction practices depend on the geographical area. During the average winter time conditions in many parts of the country classical construction activities can come to almost a complete standstill. This requires implementation of the most modern techniques and implementation of state-of-the-art materials and products, bringing forward the need for new skills and competences of the workers, even more so when projects of high energy efficiency are in question.

3.5 Construction sector and related employment within national economy

Currently, construction sector is subject to transformation, and there are practically no large construction companies left, which has significantly altered the position of the sector within the national economy and its capability of realisation of complex projects, and affected the structure of workers - also with respect to their actual qualifications. Another feature having influence on the national economy is reflected through noticeable entering of foreign construction companies onto the Slovenian market. Consequently, the share of domestic labour and domestic subcontractors and technology providers is being further reduced. Small companies are growing but they are oriented to the works abroad.

As explained, the number of employees in construction sector has been dropping consequently. It can be stated that this drop in numbers is unfortunately also followed by a drop in the general knowledge of (remaining) workers, as many of the higher-skilled workers found work outside the country. In 2011 there were around 70.000 persons employed in the Slovenian construction sector, which accounts to 8.4% of the total employment in Slovenia. An average unemployed person in construction sector has 45 years of age, and education level is below the average one in Slovenia.

In 2011 a growth of demand for workers in construction sector was identified: from 12.000 vacancies in 2010 to 21.000 vacancies in 2011. Potential employers are small companies, the works are mostly abroad, and 80% of jobs are only for fixed term for less than 6 months. Precarious workers are typical for Slovenian construction sector. In 2011 99% of foreign workers came from former Yugoslav republics, which is beginning slowly, but not yet significantly to cause problems because of the language barrier. This issue becomes a serious problem if workers from other countries than former Yugoslav republics are employed.

The described status in the sector has vital consequences for the immediate future orientation and development. Understanding the employment structure is one of the crucial areas in identification of the adult workers' training needs and appropriate training forms.

3.6 Construction sector, energy and economy

The second NEEAP 2011-2016 has provided the necessary measures in building sector to meet the targets of climate and energy package. In line with the RES Directive the Ministry prepared the legal basis for the training and certification of experts, and training programme is in full progress.

Energy efficiency regulation is being continually upgraded and the criteria strengthened. The construction sector will have to go through transformation to be able to fulfil the requirements, needs and expectations based on regulatory demands connected to national strategic orientations towards more sustainable economy, where construction and buildings in particular are still given a vital role.

The crucial points remain new construction, maintenance and major renovation, the latter having an outstanding potential for improvement of energy efficiency, thus capable of positively affecting national economical flows. As true for other listed activities, the volume of energy renovation measures depends on available financing mechanisms, so new financial mechanisms are sought after to establish and enable synergies among technical and economic prospects.

An important economic stakeholder and market operator is the public sector (government and municipalities), owning not that large, but from the role-model point of view important share of building stock. Complying with the green public procurement legislation this sector can provide a first-level boost to eco-efficient construction practice, influence the needed transformation and actually demand improved energy efficiency competences of the workforce.

3.7 Recovery measures targeting sustainable construction in Slovenia

The construction sector remains a very important segment of the Slovenian economy, which needs a closely monitored situation and activities to change the negative trends in industry. In parallel, skills and competences of the workers need to be tailored to new demands of energy efficient and sustainable construction. The Government is taking necessary measures to facilitate infrastructure projects in Slovenia, continue the activities for stimulating companies with refundable and non-refundable financial incentives, enhancing the internationalisation abroad, encouraging domestic investors and attracting foreign investors to start operation in Slovenia.

An inter-ministerial working group has been composed in 2010 to draw up measures for the recovery of the construction sector in Slovenia. These measures correspond to strategies, guidelines and regulations adopted at EU level, and include:

- Energy efficiency and renewable energy sources incentives (national Eco Fund, grants from EU Cohesion Fund, Green Public Procurement)
- Intervention of the Housing Fund in the real estate market
- Acceleration of large infrastructure projects
- Internationalisation and foreign direct investment
- Reform of Labour Legislation
- Amendments to the Construction Act
- Improvement of payment discipline
- Strengthening the inspections

Among adopted measures aimed at infrastructure, energy and environment, the most important task is related to energy rehabilitation of buildings in public ownership. With a view to encouraging sustainable use of energy, contributing to commitments arising from the energy-climate package, reducing the material costs of energy, promoting public investments and reviving construction works, the programme for energy rehabilitation of buildings in public ownership will be carried out, up to the estimated value of 20 million €, financed from the resources of the Cohesion Fund.

4 National policies and strategies to contribute to the EU 2020 energy targets in buildings

4.1 National policies and strategies in the field of energy

4.1.1 National energy strategy and policy to meet the 2020 targets

Slovenia has adopted a target to achieve a 1% annual energy savings or 9% in the period from 2008 to 2016 (NEEAP - National Action Plan for Energy Efficiency for Slovenia 2008-2016, in line with ESD directive (2006/32/ES)). Furthermore, a very ambitious target (binding by RES directive) - to achieve a 25% share of renewables in gross final energy use (19,8% in 20101, 20,3% in 2012) by 2020 and 10% share of renewables in final energy consumption in transport, was accepted (NREAP - National Renewable Energy Action Plan).

The draft National energy program (NEP 2030, in public hearing, planned to be adopted in 2012) is thus based on a number of operational objectives by 2030, i.e. improvement of energy efficiency to 20% by 2020 (27% by 2030), 25% share of RES in final energy consumption by 2020 (30% by 2030), reduction of GHG from fuel burning by 18% to 2030. The above targets assume gradual increase of the share of nearly zero energy buildings (nZEB) among new and renovated buildings by 100% in 2020 and in the public sector until 2018, moreover it is planned to reduce the energy costs in the public sector by 40 million / year by 2015, 85 million / year to 2020 and EUR 130 million / year until the 2030.

The proposed new National energy programme by 2030 recognises energy efficiency as one of the priority fields of energy development, as it is the case in the draft document Climate Strategies up to 2050, where EE is recognised as an important element of adaptation to climate change. The draft NEP 2030 envisages very concrete targets, orientations and measures to improve energy efficiency in line with EU ambitions.

The following targets are set in draft NEP 2030 for Slovenia up until 2020:

- a 20% improvement in energy consumption efficiency;
- reduced end-use energy consumption, excluding transport, of 7% relative to 2008;
- holding end-use energy consumption growth at no more than 7% relative to 2008;
- ensuring a 100-percent share of almost zero-energy buildings among new and renovated buildings by 2020, and in the public sector by 2018;
- ensuring an annual 3-percent share of renovation for buildings in the public sector starting in 2014.

4.1.2 Planned activities in relation to EPBD recast and RES and ESD Directive implementation

In respect to the transposition of Directive EPBD recast (2010/31/EU) the following remaining activities are planned:

- analysis and setting of cost-optimal minimum requirements (if necessary),

[1] http://kazalci.arso.gov.si/?data=indicator&ind_id=468

- minimum requirements for technical building systems (revision and amendment of existing requirements where necessary),
- definition of nearly zero energy building (nZEB) (revision of building code PURES 2010),
- preparation of the National plan for increasing the number of nearly zero-energy buildings,
- recommendations for the cost-optimal or cost-effective improvement of the energy performance of a building or building unit,
- establishment of independent control systems for energy performance certificates and reports on the inspection of heating and air-conditioning systems;
- consideration of the recognition of professional qualifications (Directive 2005/36/EC) with regard to the mutual recognition of professional experts which are addressed by EPBD recast Directive.

Directive ESD (2009/32/ES) has prescribed 9% of improvement of energy efficiency in 2008-2016 period. In line with the Directive ESD Slovenia prepared National energy efficiency action plan (NEEAP).

EE and RES targets in new and existing buildings in the coming years will be implemented through the measures of the second Action Plan for Energy Efficiency for the period 2011-2016 (NEEAP 2011-2016), which has envisaged, among other measures, also financial incentives for energy efficient renovation and sustainable residential buildings. This measure is aimed at energy renovation and construction of low-energy residential buildings. In terms of energy renovation of buildings, this measure will encourage the implementation of the thermal insulation of facades, attics and other building elements, replacing the windows and other measures. In the period 2011 - 2016 financial incentives are planned also for renovation of an additional 3.7 million m2 of residential areas in single family and 1.2 million m2 in apartment buildings and building of 0.2 million nearly zero energy residential buildings. Refurbished buildings will represent 8% of the total housing stock in 2010. Complete restoration will be progressively promoted.

Expected savings in 2016 are 378 GWh, and by 2020 almost 579 GWh. This measure is related to the regulations governing the energy efficiency of new and renovated buildings (PURES 2010) and measure to help increase the impact of information campaigns and counselling network (ENSVET energy advisory network).

Financial incentives for energy efficient renovation and construction of sustainable buildings in the public sector are of equal importance. The measure is aimed at energy renovation and construction of nearly zero energy buildings in the public sector. In terms of energy renovation of buildings, this measure encourages comprehensive energy renovation of buildings or part of the building envelope, the replacement building furniture and other measures, such as the renovation of the heating system or interior lighting. The amount of money in case of total renovation, including restoration of the building envelope, renovation of technical systems and installation of renewable energy use will be relatively higher, so investors are encouraged to complete renovation. In the period until 2016 an additional 1.3 million m2 of heated area in the public sector will be renovated (15% of the area of buildings in 2010) and built 38,000 m2 of nearly zero energy buildings (3% of the growth areas in the years 2011 to 2016). Stimulus will be also the replacement of 1000 boilers with modern gas-fired, 640 contemporary wood biomass boilers and 480 heat pumps. Additionally, 30,400 m2 of solar collectors will be installed.

Expected savings in 2016 are 116 GWh, and by 2020 almost 181 GWh. In accordance with the new EU Action plan on energy efficiency in the public sector annually it must be renewed at least 3% of public buildings (by area), where they should be after refurbishment rank among the top 10% of all public buildings since 2014.

The expected response to the incentives is 2800.000 m2 living area nearly zero energy buildings by 2030 in new construction and renovation of housing stock, 4% / year in public sector buildings, renovation of 66% by 2030 (of which 59% in low-energy standard); the rest of the tertiary sector 46% (of which 26% of the improved standard).

In order to meet the target of a 25% share of RES in final energy consumption National renewable energy action plan for Slovenia[2] (NREAP 2010-2020) defined that Slovenian Government will ensure an adequate support environment for (listed are building related items):

- energy rehabilitation of existing buildings, mainly in the public sector, and construction of active buildings representing what are technologically advanced structures,
- replacing heating oil with wood biomass and other renewable energy sources,
- district heating systems based on renewable energy sources and heat and power cogeneration,
- replacing electricity for producing sanitary hot water with solar energy and other renewable energy sources,
- generation of electricity from renewable energy sources,

The key elements of the support environment up to 2020 are inter alia: financial incentives for production of electricity from RES and high-efficiency cogeneration, regulation related to share of RES in district heating and in buildings (revision), improved planning procedures, new financial mechanisms, support for establishing a wood biomass market, support to education and training, RTD, and systematic promotion related to RES use.

With respect to Build up skills project it is necessary to stress the following measures planned in NREAP:

- **Systematic inclusion of topics in the area of EE and RES in natural science curriculums in primary and secondary schools and faculties, and in lifelong learning and training programmes**

  The ministry responsible for education will promote:

  - Systematic inclusion of topics in the area of EE and RES in natural science curriculums in primary and secondary schools;

  - a harmonised programme of extracurricular activities for young people in the fields of EE and RES;

  - systematic inclusion of topics in the area of EE and RES in lifelong learning and training programmes.

- **Setting up a system of certification for installers**

  The ministry responsible for energy has transposed the requirement into the Energy Act and has drafted the implementing regulations for certification or an equivalent system of qualification for installers in accordance with Article 14 of Directive 2009/28/EC.

[2] http://www.buildup.eu/publications/22836

The Directive EPBD recast (2010/31/EU), Directive ESD (2009/32/ES) and Directive RES (29/28/ES) all address training and certification of professionals whose activities may influence energy efficiency and the use of renewables.

In Slovenia the Energy act provided a common article for all certification schemes from RES, EPDB and ESD directives. Thus the basis for selection of accredited training institutions for different technologies and areas in accordance with the directives of RES, EPBD and ESD is provided.

Based on ESD directive (new EE Directive 12/27/EU) the act gives the basis for certification of providers of energy services: energy accounting, providers of energy audits, installers of building elements – (not yet in this version). Currently, there are early activities on-going to support the ESCOs operation. Some energy managers have already been trained based on on-going voluntary scheme – EUREM .net.

EPDB Directive required training and accreditation / licencing of independent experts for energy performance certification of buildings and for the inspection of air-conditioning systems - Both systems are established and the accredited institutions are chosen. The trainings of energy performance certification experts are successfully on-going since 2011.

RES Directive requested certification schemes for installers of small-scale biomass boilers and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps. Based on the energy act in 2012 the respective regulation for training content and training institutions was drafted.

4.1.3 National building codes

Slovenia has implemented EPBD based minimum requirements for energy efficient buildings in the year 2002, and accepted two revisions in 2008 and 2010 building codes. In 2002 regulation the minimum requirements for new buildings and major renovations were expressed by maximum energy needs for heating (PTZURES 2002) and complemented with maximum U values; in 2008 regulation (PURES 2008) an intensive reduction of transmission losses through the building envelope as well as new requirements on obligatory 25% use of RES in final energy use were introduced, and more recently, as a part of the implementation of EPBD Recast, the latest 2010 building code (PURES 2010) put focus also on the calculation of primary energy and CO2 indicators, set additional minimum requirements in terms for primary energy for heating, limited the heating and cooling needs and added many new minimum requirements for energy systems.

The process of setting national minimum requirements was based on the advanced but market available technologies for energy efficient buildings and defined in accordance with the national targets and obligations set by the 20-20-20 policy.

<u>Minimum requirements for new buildings</u>

The definition of minimum requirements, in line with the EPBD Recast, was the aim of the revised Regulation on efficient use of energy in buildings (valid from July 2010, and fully in force after January 2011). Minimum requirements are expressed using performance based requirements, energy related requirements and detailed technical requirements for the building components and systems.

Performance based minimum requirements are focused on bioclimatic architectural concept, low energy envelope with high air tightness, and treating thermal bridges by limitation of linear thermal transmission coefficients (therefore the simulation of thermal bridges is becoming a frequent design practice). A special set of minimum requirements refers to the energy efficiency of components and systems. As requested in the EPBD Recast, it is required that before the design of HVAC systems, the potential of shading, passive cooling and night ventilation is utilised. Mechanical ventilation with heat

recovery is not a mandatory technology, but in practice it is needed for buildings with energy class B and above.

The compliance with the PURES – 2 2010 regulation is demonstrated by fulfilling the following energy related minimum requirements: maximum allowed specific transmission heat losses (Ht'), maximum annual heat demand for space heating and, for residential buildings, also for cooling (Qnh, Qnc), maximum primary energy for operation of the energy systems (HVAC and lighting) – for residential buildings, maximum U-values of the envelope elements. Public buildings must comply with 10% more severe requirements. Energy related minimum requirements (Qnh) are imposed in two steps: for the period from 2010 to 2014, and for the period beyond the year 2014 – see Figure 4.

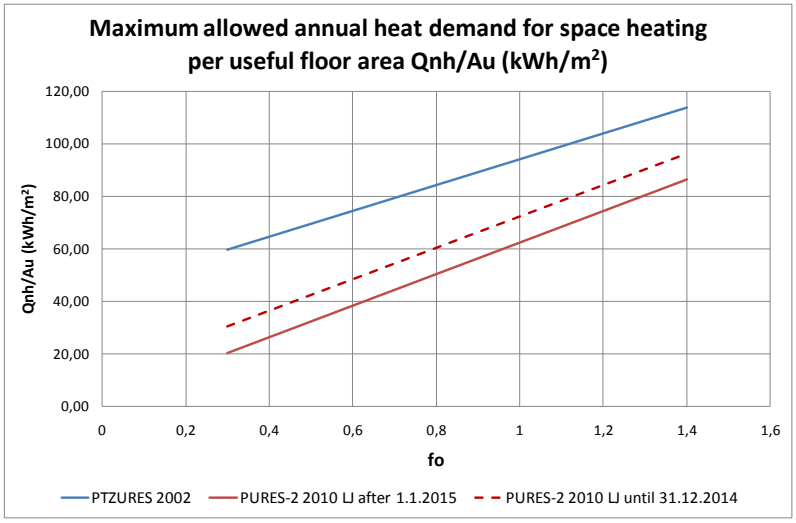


Figure 4: Minimum requirements for annual heat demand for space heating for new buildings from the PURES-2 2010 regulation, in comparison to the previous regulations. (Source: Implementing the energy performance of buildings directive, 2011, www.ca-epbd.eu)

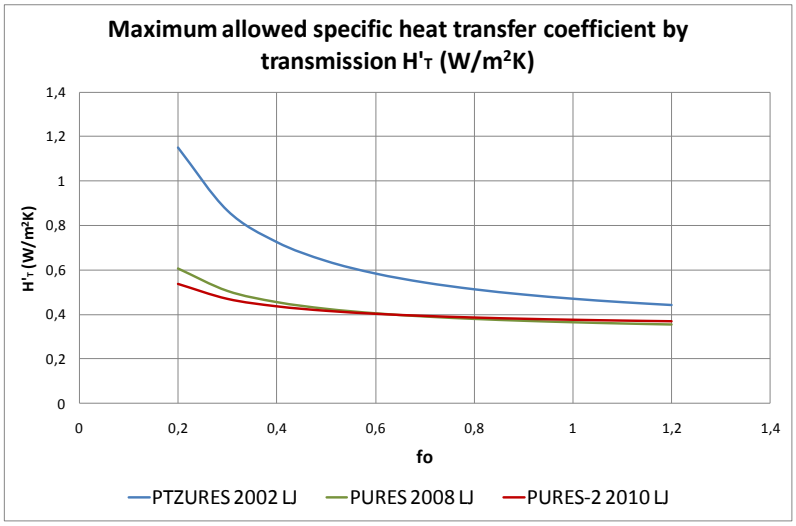


Figure 5: Minimum requirements for specific heat transfer coefficient by transmission for new buildings from the PURES-2 2010 regulation, in comparison to the previous regulations. (Source: Implementing the energy performance of buildings directive, 2011, www.ca-epbd.eu)

The use of RES is mandatory in all new buildings since 2008, i.e., min. 25% of total final energy use for operation of the energy systems in the building must be covered by RES. Alternatively, the RES requirement is considered to be fulfilled also if the share of RES used for space heating and cooling

and DHW is obtained in one of the following ways: 25% from solar energy, 35% from gas biomass, 50% from solid biomass, 70% from geothermal energy, 50% from heat from the environment, 50% from CHP, 50% from energy efficient district heating/cooling; or if the building demonstrates at least 30% lower annual heat demand than defined in the minimum requirements; or by installation of solar collectors for hot water (min. 6 m2/residential unit).

The use of RES is mandatory in all new buildings since 2008, i.e., min. 25% of total final energy use for operation of the energy systems in the building must be covered by RES. Alternatively, the RES requirement is considered to be fulfilled also if the share of RES used for space heating and cooling and DHW is obtained in one of the following ways: 25% from solar energy, 35% from gas biomass, 50% from solid biomass, 70% from geothermal energy, 50% from heat from the environment, 50% from CHP, 50% from energy efficient district heating/cooling; or if the building demonstrates at least 30% lower annual heat demand than defined in the minimum requirements; or by installation of solar collectors for hot water (min. 6 m2/residential unit).

Table 2: Minimum requirements for components of the building envelope according to PURES 2010 building code.

Components of the building envelope	Maximum thermal transmittance according to PURES 2010 building code U_{max} (W/m^{2}K)
Walls	0.28 W/m^{2}K
floors between flats	0.90 W/m^{2}K
flat roofs	0.20 W/m^{2}K
windows	1.3 W/m^{2}K
glazing	1.1 W/m^{2}K
doors	1.6 W/m^{2}K

Additional minimum requirements refer to maximum U-values of building envelope and windows and to the air tightness of the envelope (n50 < 3.0 for natural ventilated buildings and n50 < 2 for buildings with mechanical ventilation with obligatory heat recovery).

A comprehensive list of requirements refers to energy efficiency characteristics of installations. Heat recovery in ventilation must be used due to the strict requirements for maximum allowed ventilation heat losses. The minimum required heat recovery in ventilation and/or A/C systems is 65%, and 75% in low energy buildings. Individual electrical heaters for domestic hot water are not acceptable, unless economically reasonable. Low temperature heating systems (max. 550C), as well as condensing gas boilers, are obligatory in new buildings. Heat and cold must be metered per individual unit. Additional requirements for cooling refer to obligatory shading of the envelope and to efficiency requirements for cooling systems.

The minimum requirement for lighting defines maximum allowed specific power of lighting devices per building category. Energy saving lamps are obligatory, and only a maximum of 20% of lighting may be covered by incandescent light bulbs.

At the design stage, it is obligatory to prepare a “summary of thermal characteristics of the building”, where the main building and system characteristics and energy and CO2 indicators are given. After the building is completed, the calculation and “summary” has to be repeated (by the designer, for the building as built), as this is the proof for final control of compliance with the regulation. Fulfilment of minimum requirements will have to be demonstrated in the design in order to obtain a building permit,

and when the building is built, when applying for a use permit for the building. This is the core technical documentation used in the next step by the independent expert preparing the energy performance certificate.

Minimum requirements for building renovations

Minimum requirements apply to all new buildings, as well as to major renovations, i.e., if at least 25% of the surface of the building envelope is subject to major renovation. The minimum requirements for major renovations must be implemented regardless of the size of the building (the 1,000 m2 EPBD limit is not used).

If a renovation (i.e., a building permit is needed) is limited to less than 25% of the thermal envelope surface, in case of investment maintenance works on the building envelope and in case of buildings smaller than 50 m2, only the minimum requirements for U-values of the envelope must be considered (i.e., an additional insulation layer will be mandatory).

In case of major renovation of the heating system and in case of maintenance and replacement works, minimum requirements for the systems, subsystems and elements of the same level as required for new buildings are to be implemented.

4.1.4 Envisaged contribution of the building sector to the 2020 targets

Draft National energy program (NEP 2030) with more ambitious general targets as well as operational targets for building sector; has foreseen 50% of new and renovated public buildings of nZEB standard by 2015 (2018 for residential) and 100% share by 2018 (by 2020 for residential).

The National energy efficiency action plan, National renewable energy action plan and Action plan for Green public procurement are supporting the implementation of the national targets on energy efficiency and use of renewables in the building sector.

On the basis of the first National energy efficiency action plan 2008–2016 (NEEAP) (required in ESD directive; 2006/32/EC), Slovenia is to achieve cumulative savings of at least 9% in relation to the starting point for final energy consumption in the 2008–2016 period, or at least 4,261 GWh. The NEEAP rests on the implementation of 29 sectorial, multi-sectorial and horizontal instruments. The package of financial incentives for residential sector covers four programmes: energy-efficient renovation of buildings and sustainable building construction, energy-efficient heating systems, efficient electricity use, and the efficient energy use for low-income households scheme, special focus is put on promoting efficient energy use in the residential sector. For tertiary sector (incl. public sector) the set of instruments includes financial incentives for the energy-efficient renovation of buildings and the sustainable construction of buildings, energy-efficient heating systems, and efficient electricity use, as well as green public procurement for public sector.

The targeted savings of energy related CO2 emissions for the period 2008–2016 in residential and tertiary sector (i.e. in buildings) account for 638 kt CO2 ekv.

In the whole period 2008 – 2020 the envisaged contribution of the building sector due to the implementation of the sectorial measures in residential / households and tertiary / public sector can be summarized according to NEEAP 2 (2011-2016) , Tab. 43. Estimates indicate that the target end-use energy savings in 2016 and 2020 will be achieved or exceeded.

The sectorial measures in households G1 - Financial incentives for energy efficient renovation and sustainable construction of residential buildings, G2 - Financial incentives for energy efficient heating systems, G-3 - Scheme of energy efficiency for low-income households, G4 - Compulsory division and calculation of heating costs in multi-dwelling and other buildings according to actual consumption and

G5 - Energy advice network for citizens are expected to result in 1,558 GWh (of final energy use) by 2016 and in 2,181 GWh energy savings by 2020.

The sectorial measures in public sector J1 - Green public procurement, J2 - Financial incentives for energy efficient renovation and sustainable construction of buildings in the public sector, J3 - Introducing an energy management system in the public sector and J4 - Financial incentives for efficient electricity consumption in the public sector are expected to result in 413 GWh by 2016 and in 499 GWh of energy savings by 2020.

4.2 National policies and strategies in the field of vocational education and training (VET)

In Slovenia, the system of education and training is based on the legal framework which regulates formal education fields, recognition of non-formally acquired knowledge and lifelong learning.

Education and training are regulated by extensive legislation; listed hereinafter are only those acts that have immediate effect on the education and training of personnel who will be planning and implementing projects associated with energy-efficient building, energy-saving building restoration and efficient management of energy technologies. These are:

- Organisation and Financing of Education Act
- Vocational and Technical Education Act
- National Professional qualifications Act

The legislative framework is based on development strategies prepared by groups of experts, taking into consideration the results of evaluations, EU recommendations and comparisons with development trends in education systems of comparable European states. Developing education system is a sensitive process; rapid changes are generally unsuccessful, whereas partial changes may cause the opposite effects due to their unforeseeable impacts on the system.

4.2.1 Education system in Slovenia

Presented on page 30 is the education system scheme in Slovenia, showing vertical and horizontal links which are important particularly in vocational and technical education in the expert fields addressed by the Build Up Skills Slovenia project.

4.2.2 Lifelong learning

Slovenia laid down its lifelong learning development policies in the National Lifelong Learning Development Strategy. Lifelong learning is both an activity and process encompassing all forms of learning, whether formal, non-formal, random or informal. It can take place in different learning environments with the aim of improving an individual's knowledge, skills and competences. By learning, we also develop personality traits and shape our values. The development of lifelong learning concept involves a shift from education to learning, which means that an individual uses other possibilities of learning which are not part of the education system, to attain his goals.

The objectives of the lifelong learning strategy are based on the EU strategic objectives in education and training and are focused on improving the quality and efficiency of education and training systems, facilitating and enhancing access to education and training and opening up these systems to the wider environment.

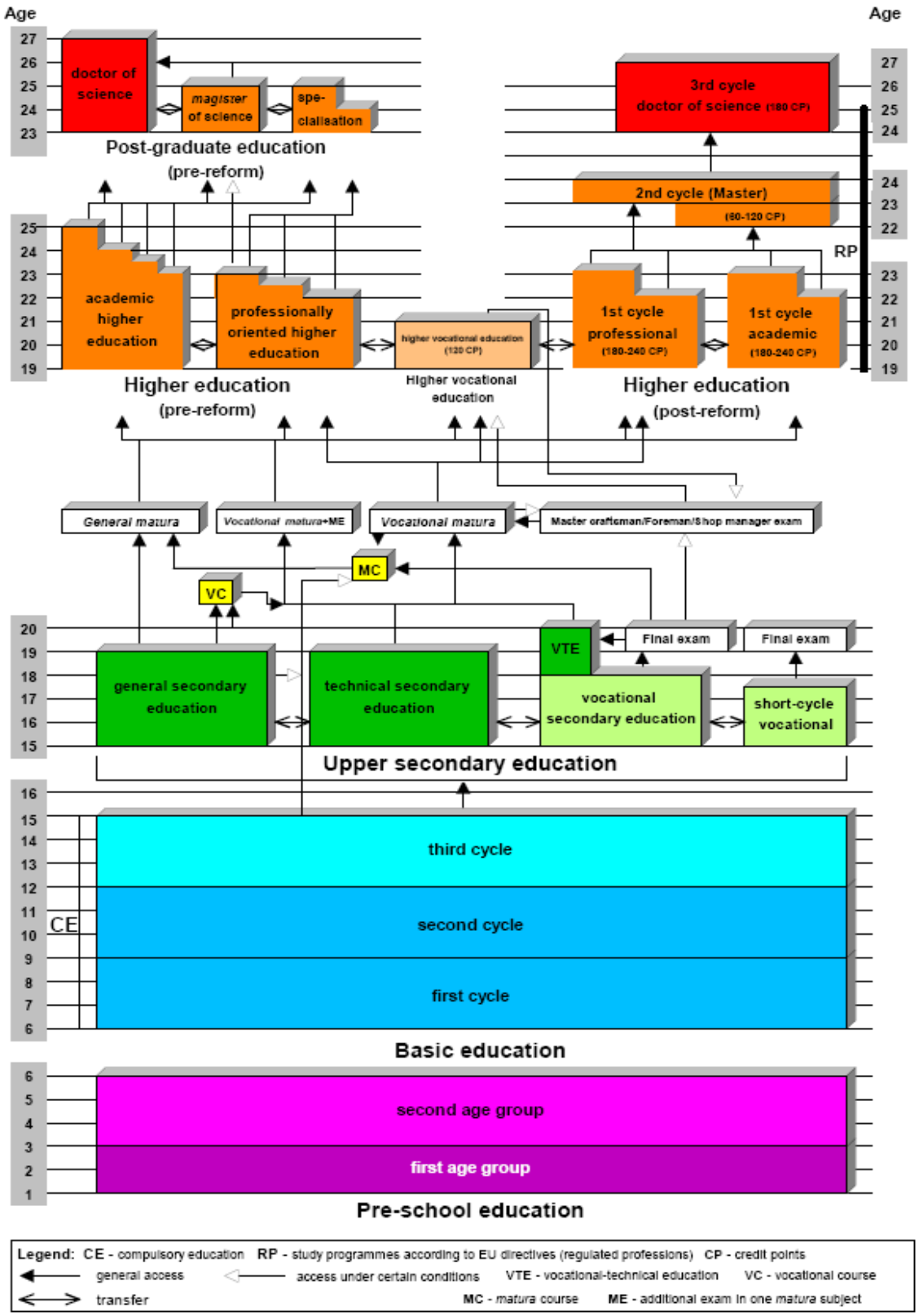


Figure 6: Educational system in Slovenia.

Learning for successful and quality work and career has recently proved to be one of the most important fields because it encompasses both initial and continuing vocational and technical education. In defining the needs for education and shaping the appropriate offer, it is necessary to

stimulate closer collaboration between schools and employers and adjust them with the interests of employees, employers, education and training institutions, and local community.

By introducing the model of human resources development in work processes and implementing the principle that every workplace is also a learning place, lifelong learning can also be implemented in workplaces. It is important, though, that employers and employees are aware of their responsibility for their progress. It is also important that employers are aware of the importance of stimulating motivation for learning and work and that they provide opportunities for additional learning, education and development to the employees.

A working organisation shall not follow an employee's development passively because education is more effective when the organisation is capable of adjusting and developing into a learning-friendly environment. The system of job promotion should be associated with continuing education and training which shall not be based only on formal education, in particular due to the development of modern technologies and their impact on work.

Transfer of knowledge and skills between the employees is also very important, in particular for the newly employed young people who have no working experience. The size of a company has great impact on the method and organisation of training: in small- and medium-sized companies. Training is specific and different from the training provided in large companies. Problems often arise particularly in small-sized companies which cannot afford more extensive forms of education and training which may lead to unequal access to further education and training and in consequence undermines the small companies' competitive edge.

Contemporary adult education should be based on the principles of openness and accessibility, independence of participants, flexibility, current relevance and individuality.

The integration of the above mentioned principles in adult education programme and organisational implementation structure calls for the following:

- Abandoning of schemes and patterns which keep education activity under the traditional teaching and didactic schemes and school and institutional schemes;
- Introducing modes and methods which are based on the participants' own activity, their internal interest and creative cooperation;
- Optimum flexibility and transitivity in education and training, free of the stereotypes of time, space, curricula and forms;
- Openness and effective organisation of education system;
- Introduction of new opportunities such as distance learning, multimedia learning, experimental learning and alternative models of teaching and learning.

Formal education programmes are the same for the youth and adults and result in officially recognised education. The method of implementation is adapted to the characteristics of adults.

Analyses showed that the most frequent barriers to involving adults in education and training are a lack of time and money. The statistics indicates that the participation of adults in secondary education programmes has been decreasing in the last years because there are no appropriate motivation and support measures. More adults enrol in programmes of non-formal vocational education, training and advanced education, which are often associated with job promotion or statutory requirements. Generally, such education is not validated in relation to formal education and does not provide clear information on the achieved competences. Not enough attention is paid to non-formal education (particularly that which is carried out in a traditional school environment) within the national education system, which is also reflected in poor systemic integration between formal and non-informal education; moreover, validation and recognition have not been developed into a comprehensive

system despite the provided formal platform, so that the acquisition of national professional qualifications has not yet fulfilled its expected role.

Adult formal education is carried out mainly by secondary general, vocational and technical schools, higher education institutions and faculties. Recently, non-formal education providers have become increasingly important, particularly in the vocational field, including companies and institutions.

The lifelong learning concept has considerably modified the perception of the role of initial education and training in the total education and learning. It has indirectly triggered great changes in the perception of the objectives of education and the methods of their achievement which is marked by the term competence-based approach. The latter has had a great impact on the secondary vocational and technical education, and also on the primary and tertiary education.

For the purpose of implementing the philosophy of lifelong learning and creating better opportunities for lifelong learning, working with the youth when still in the schooling process is of utmost importance, as is also working with schools.

For the youth, foundations for successful lifelong learning should be established; sound basic knowledge, skills and motivation developed, learning culture developed and consolidated, cooperation, team work, problem learning and reflection in learning groups encouraged, diversity of learning paths promoted, the ability of independent learning developed, the capability of an individual to be able to discover his strong and weak points developed, creativity, innovative thinking and entrepreneurship encouraged. Learning style should focus less on tackling the subject matter prescribed in advance and more on resolving the problems.

Schools should become learning centres open to the local environment and to different learning interests, and they should encourage cooperation of local experts by their flexible methods.

The support of teachers in the promotion and implementation of lifelong learning strategies at schools should be secured; teachers should also take account of the results of individual out-of-school learning, encourage independent learning, etc.

To implement lifelong learning strategies, it will be essential to encourage the development of a responsible individual, the culture of learning organisations and systematic development of personnel in companies and in schools. Without these processes, lifelong learning shall remain more a necessity than a need, because the learning culture is not yet well developed in our country.

4.2.3 National policies and strategies related to green skills and jobs

Republic of Slovenia has no explicit written strategy for green jobs. Nevertheless, documents dealing with the education for sustainable development tackle this topic, too:

- The potential for green jobs is included in some other national documents, for example the Strategy of development of Slovenia[3].
- National renewable energy action plan 2010-2020
- Regulation on green public procurement.

This topic is also included in some stakeholders` documents, for example in the Program guidelines for the period 2011-2016 of the Union of Construction workers of Slovenia (SDGD).

[3] http://www.slovenijajutri.gov.si/fileadmin/urednik/dokumenti/strategija_razvoja_slovenije.pdf.

In the field of training and education the Ministry of Education and Sport accepted the Guidelines for education for sustainable development from pre-school education to university education in 2007[4].

This document is based on UNECE Strategy for Education for Sustainable Development (adopted at the High-level meeting, Vilnius, 17—18 March 2005) and prepared in accordance to EU guidelines, pointing out that successful change from non-sustainable habits depends on the quality of education on sustainability related topics at all levels The guidelines build on several key areas of sustainable development among them also on environmental protection and sustainable management of natural resources. The second part (roadmap) suggests activities for different groups of stakeholders: kinder gardens and schools, responsible ministry, public institutions in the field of training and education, NGOs, and municipalities.

The Ministry of Education and Sport and The National Education Institute of the Republic of Slovenia elaborated the document: "Education for sustainable development, Good practices in Slovenia"[5] which presents work done in different levels of education and training.

A systematic analysis of the education for sustainable development in Slovenia was done within a national research project by the group of researchers at the Zavod Sv. Ignacija, Raziskovalni inštitut 2020) (Research institute 2020). The final report[6] suggests a number of measures to raise awareness and support more inclusion of these topics in schools` curricula.

The recent document dealing with green skills in Slovenia is titled: Slovenia – low carbon society by 2050: Strategy for communication and education about climate change and sustainable development. This document[7] was prepared by the Government Office of the Republic of Slovenia of Climate Change in 2012 to support the strategy for the transition of Slovenia to low carbon society.

The document defines the goals and directions for developing human resources for the transition to low carbon society and sustainable development. It suggest modernisation ("the greening") of system of national qualifications, knowledge catalogues and education programmes (curricula) and also establishing new professional qualifications. The training for green skills has to be implemented for unemployed persons but also as part of changes of qualifications of existing workers. Among other supporting measures it suggests green scholarships and schemes for training in SMEs.

The mentioned documents, policies and strategies resulted in different activities8. Renovation of vocational education and training programmes co-financed from the ESF (2006-2008) was implemented. Generic or core competencies, which include environmental protection, energy saving and safety at work ware included in education programs, for example into the subject of Environment

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http://www.mizks.gov.si/fileadmin/mizks.gov.si/pageuploads/podrocje/razvoj_solstva/trajnostni_razvoj/trajnostni_smernice_VITR.doc

5 VZGOJA in izobraževanje za trajnostni razvoj: primeri dobre prakse v Sloveniji / [uredila Erika Rustja]. - 1. izd. – Ljubljana, Ministrstvo za šolstvo in šport : Zavod Republike Slovenije za šolstvo, 2007 ISBN 978-961-234-617-1

6 Analiza in spodbujanje vključevanja vzgoje in izobraževanja za trajnostni razvoj v osnovne šole, Zavod sv. Ignacija za izobraževanje in razvoj, Authors: mag. Hedvika Dermol Hvala, dr. Nika Golob, mag. Dušan Jamšek, dr. Petra Javrh, dr. Darja Skribe Dimec, 2008.

7 Slovenija - nizkoogljična družba do leta 2050, Strategija komuniciranja in izobraževanja o podnebnih spremembah in trajnostnem razvoju do leta 2050, Služba vlade Republike Slovenije za podnebne spremembe, , Author Dr. Darja Piciga, 2012

8 Workshop: Strategy for communication and education about climate change and sustainable development, Analysis of the status, authors: Dr. Darja Piciga, Government Office of the Republic of Slovenia of Climate Change):

and safety at work, sometimes in the course Sustainable Development. In the period from 2008 to 2013, new educational programs are gradually being introduced in schools (supported by ESF), and the management and professionals in middle and senior schools are being trained.

The new educational programs at all levels of vocational and technical education allow schools to use a certain part of the curriculum (open curriculum - up to 20%) on their own. This is seen as an important opportunity to integrate now themes in the curriculum, including the ones dealing with combating climate change and nZEB.

The result which directly relates to Build up Skills Slovenia is the development on new vocational qualifications standards . New national vocational qualifications have been prepared, for example for installer of solar systems and heat pumps, installer of heating systems, installer of photovoltaic systems, and energy managers/energy manager in buildings.

National implementation of European Qualification Framework in Slovenia is described in detail in chapter 6.3.

5 Statistics on building and energy sectors

5.1 Statistics on the building sector

5.1.1 Structure of the building stock

The majority of the building stock in Slovenia is represented by residential buildings (75%) while the non-residential buildings account for 25%.

The residential building stock in Slovenia is mostly represented by single family houses. Most accurate data were provided by establishment of the Real estate registry (REN 2009) in Slovenia.

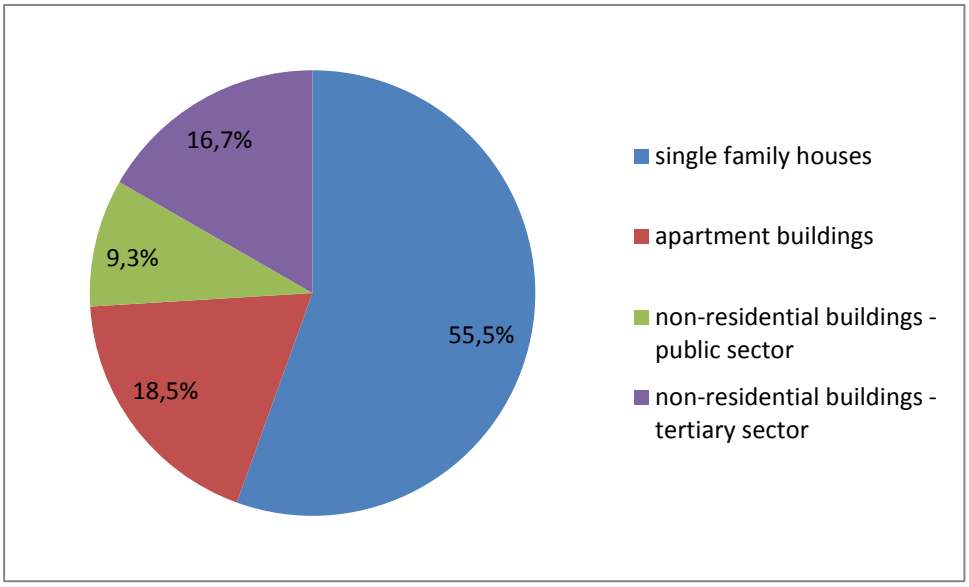

Figure 7: Share of building types per useful floor area in %. (Source of data: SORS 2008)

The overview of the Slovenian building sector is based on the Real estate registry (REN 2009) and the analyses made in IEE TABULA project, ARRS ZEVZ project and this particular one.

Table 3: Structure of the existing residential building stock in 2009, per number of buildings, per number of flats and per useful floor area.

REN 2009	SFH	MFH	Total
Buildings	493.283	25.315	518.598
Flats	526.825	325.868	852.693
Au 1000 m2	50.349	16.814	67.163
Buildings	95%	5%	100%
Flats	62%	38%	100%
Au 1000 m2	75%	25%	100%

Note: SFH in this table contain 1- dwelling and 2-dwelling family buildings

The structure of non-residential building stock in Slovenia, in useful floor area and percentage, is presented in Figure 8 and Figure 9.

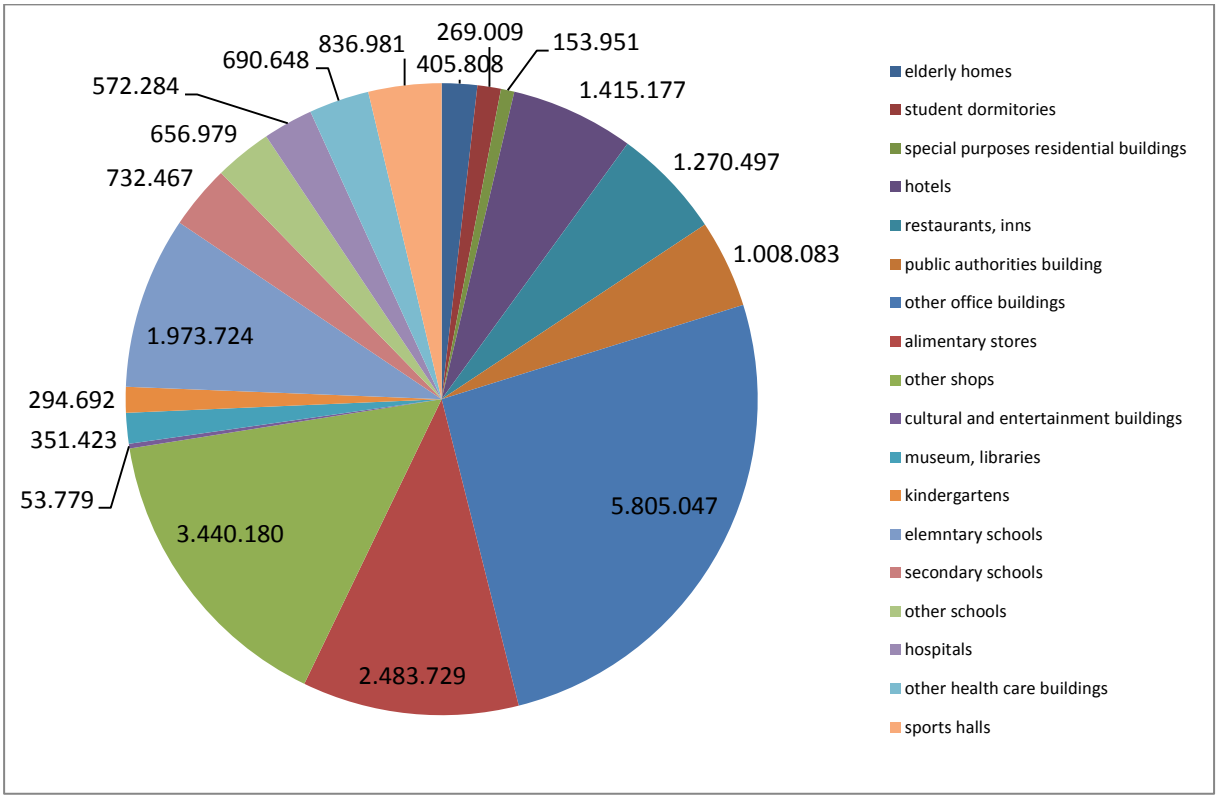

Figure 8: The non-residential building stock in Slovenia (in m2 of useful floor area) in 2009.

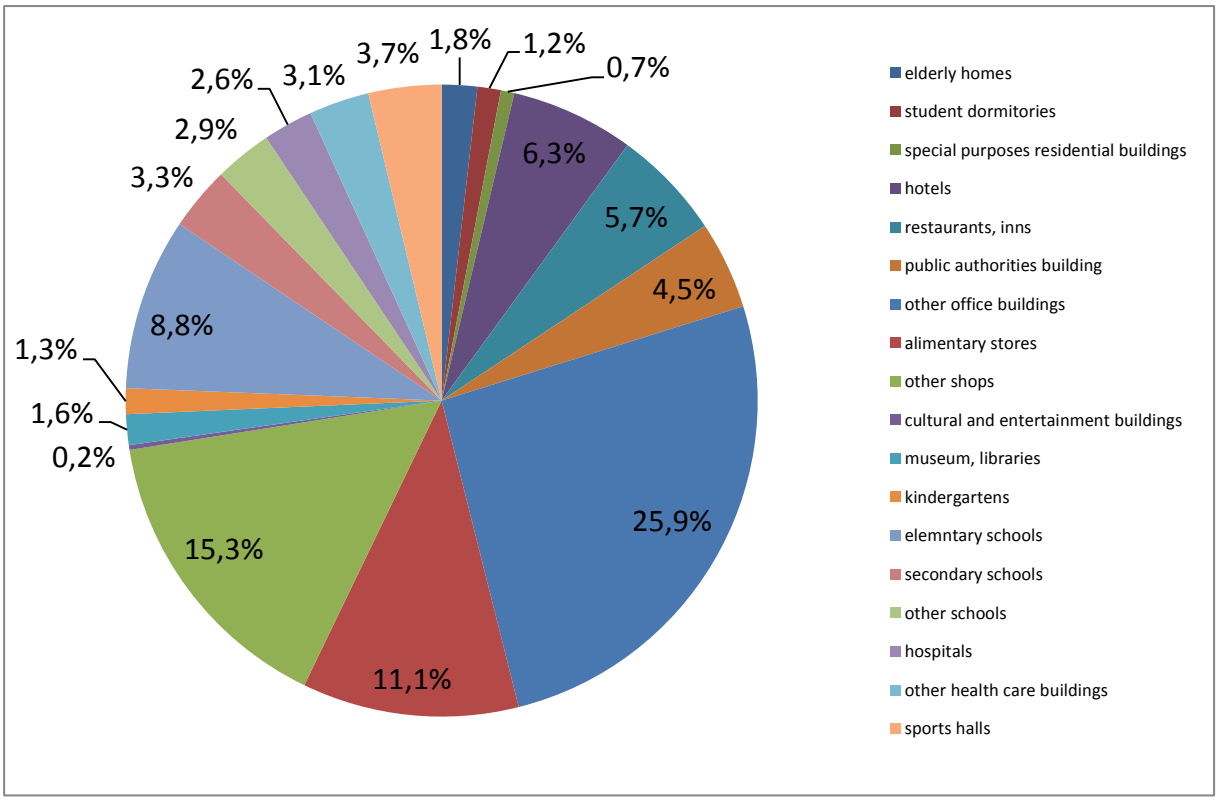

Figure 9: The non-residential building stock in Slovenia (in % of total useful floor area) in 2009.

In the Table 4 the annual number, gross floor area and the volume of the completed new buildings in the particular year is presented. The trend show the decrease in construction of residential and other non-residential investments in other sectors but public buildings. The activities in construction sector correspond to the economic crisis and the situation in construction sector in the last years.

Table 4: Estimation of the annually completed new buildings (Source: Statistical yearbook, SORS 2011)

20.7 Ocena dokončanih novih stavb[1)]

Estimation of new buildings completed[1)]

	Merska enota	1995	2000	2005	2007	2008	2009	2010	2011	*Unit*	
SKUPAJ											***TOTAL***
	število	**6519**	**5462**	**6035**	**5716**	**5298**	**5300**	**5040**	**4439**	***number***	
	1000 m^2	**1498**	**1842**	**2412**	**3302**	**3067**	**2646**	**2187**	**2131**	***1000 m^2***	
	1000 m^3	**4558**	**6508**	**9477**	**13702**	**11516**	**9983**	**7926**	**7778**	***1000 m^3***	
Stanovanjske stavbe											*Residential buildings*
	število	4796	4151	3901	3883	4077	4162	4021	3449	*number*	
	1000 m^2	1060	1022	1212	1476	1832	1597	1309	1245	*1000 m^2*	
	1000 m^3	3012	2938	3354	4067	5085	4575	3730	3622	*1000 m^3*	
Gostinske stavbe											*Hotels and similar buildings*
	število	85	66	181	170	114	83	102	88	*number*	
	1000 m^2	17	49	111	206	206	83	83	77	*1000 m^2*	
	1000 m^3	53	154	391	898	891	275	265	285	*1000 m^3*	
Upravne in pisarniške stavbe											*Office buildings*
	število	22[2)]	253	136	79	53	48	40	55	*number*	
	1000 m^2	48[2)]	82	96	99	126	111	116	213	*1000 m^2*	
	1000 m^3	151[2)]	272	335	390	457	416	432	788	*1000 m^3*	
Trgovske in druge stavbe za storitvene dejavnosti											*Wholesale and retail trade buildings*
	število	201	229	304	235	167	132	96	68	*number*	
	1000 m^2	74	268	198	439	298	221	128	89	*1000 m^2*	
	1000 m^3	287	1238	1001	2167	1436	1183	703	447	*1000 m^3*	
Stavbe za promet in stavbe za izvajanje elektronskih komunikacij											*Traffic and communication buildings*
	število	182	238	231	166	96	100	102	93	*number*	
	1000 m^2	15	35	94	92	68	60	137	57	*1000 m^2*	
	1000 m^3	51	109	318	288	297	238	514	205	*1000 m^3*	
Industrijske stavbe in skladišča											*Industrial buildings and warehouses*
	število	318	228	392	381	252	232	189	189	*number*	
	1000 m^2	76	236	413	570	326	297	169	219	*1000 m^2*	
	1000 m^3	287	1236	2857	4043	2414	2083	1098	1383	*1000 m^3*	
Stavbe splošnega družbenega pomena											*Buildings for public entertainment, education or hospital and institutional care*
	število	30	66	84	125	67	76	70	92	*number*	
	1000 m^2	58	117	93	199	73	135	103	138	*1000 m^2*	
	1000 m^3	228	444	444	875	398	594	495	656	*1000 m^3*	
Druge nestanovanjske stavbe											*Other non-residential buildings*
	število	885	231	806	677	472	467	420	405	*number*	
	1000 m^2	150	33	196	221	138	141	142	94	*1000 m^2*	
	1000 m^3	488	117	776	975	539	618	690	392	*1000 m^3*	

1) Upoštevani so objekti, pridobljeni z novogradnjo in povečavo. Po Enotni klasifikaciji vrst objektov (CC - SI).
Including projects acquired by new construction and extension. According to the Classification of Type of Construction (CC - SI).
2) Investitor je pravna oseba.
Investor is a legal person.

5.1.2 Building permits

Slovenia is one of the EU countries that suffered most in the economic crisis.

The investments in construction sector have constantly decreased since the year 2006. The construction sector has suffered due to debts and insolvency, bank loans for new investments were significantly reduced, high prices of building plots and large stock of unsold flats from previous years further influenced the decrease of construction of new buildings. In 2011 the bankruptcies of construction companies continued and resulted in the lack of previously common investors in real estate projects.

This process was significantly reflected in residential sector, where the building permits expressed in floor areas were reduced in 2011 for almost 30% compared with the year 2010. Comparing with the peak year 2007 for residential buildings construction, the construction of new residential buildings was reduced in 2011 for 60%, mostly due to the reduction of the real estate projects for the market.

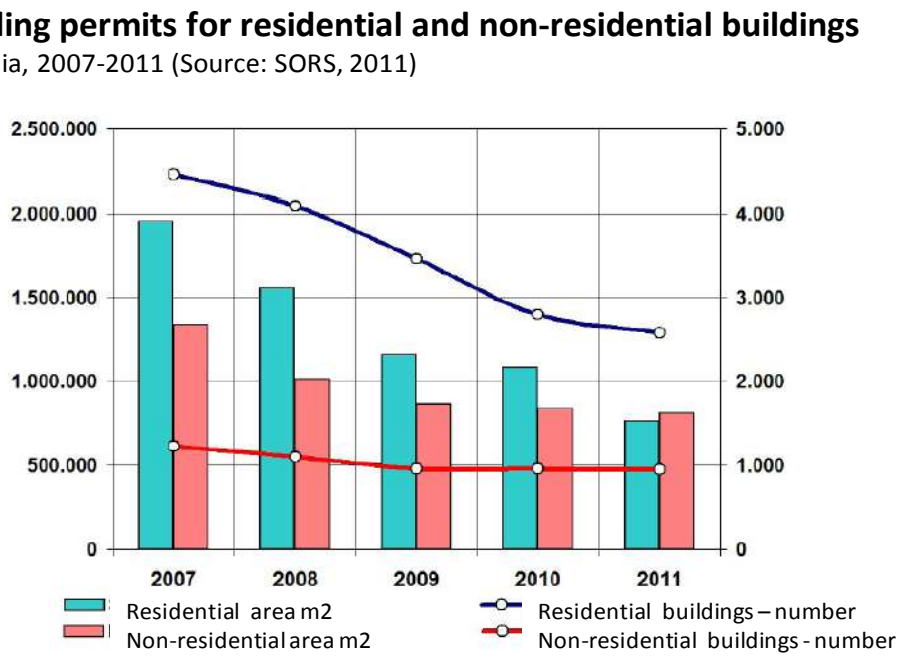

Figure 10: The building permits expressed in number of buildings and floor area of buildings (Source: SORS 2011 and The Surveying and Mapping Authority of the Republic of Slovenia – SMARS).

Table 5 presents the information about the building permits issued for new construction, extension and conversion or improvement of buildings, based on the national statistics.

Table 5: Building permits issued for new construction, extension and conversion or improvement of buildings (Source: SORS, 2012)

20.5 Gradbena dovoljenja za novogradnje, povečave in spremembe namembnosti stavb[1)]

Building permits for new construction, extension and conversion-improvement of buildings [1)]

	Skupaj *Total*		Novogradnja in povečava *New construction and extension*										Sprememba *Conversion-improvement*	
			enostanovanjske stavbe *one-dwelling residential buildings*		dvo- in večstanovanjske stavbe *two- and more dwelling residential buildings*		stanovanjske stavbe za posebne družbene skupine *residencies for communities*		poslovne in upravne stavbe *office buildings*		druge stavbe *other buildings*			
	število *number*	površina *buildings' floor area* 1000 m²	število *number*	površina *buildings' floor area* 1000 m²	število *number*	površina *buildings' floor area* 1000 m²	število *number*	površina *buildings' floor area* 1000 m²	število *number*	površina *buildings' floor area* 1000 m²	število *number*	površina *buildings' floor area* 1000 m²	število *number*	površina *buildings' floor area* 1000 m²
2005	5838	2519,9	3620	875,4	445	449,9	11	21,5	61	72,4	1479	1003,9	222	96,8
2006	6375	3362,6	3992	991,9	543	566,9	14	40,7	75	95,5	1565	1568,0	186	99,5
2007	5858	3410,8	3814	957,1	617	904,0	21	93,7	56	135,6	1172	1201,4	178	119,0
2008	5373	2656,3	3517	874,5	551	630,4	21	50,4	57	129,4	1042	884,2	185	87,4
2009	4570	2089,9	3106	789,6	337	327,6	18	43,3	36	118,0	925	745,4	148	65,9
2010	3902	1975,1	2589	656,3	195	367,3	17	58,9	42	181,2	917	654,4	142	57,0
2011	3621	1611,2	2365	587,5	212	153,5	8	17,8	45	127,9	895	680,7	96	43,9

1) Podatki so preračunani po Klasifikaciji vrst objektov (CC-SI) za leto 2012 (Ur. l. št. 109/2011). Po tej klasifikaciji so stanovanjske stavbe z oskrbovanimi stanovanji uvrščene med stanovanjske stavbe za posebne družbene skupine in ne med večstanovanjske stavbe, kot so bile uvrščene po Enotni klasifikaciji vrst objektov iz leta 2003.

Data are calculated based on Classification of Types of Constructions for 2012, which was published in OJ RS No. 109/2011. Based on this classification residential buildings with service residences for the elderly are classifield among residences for communities. Based on Classification of Types of Constructions for 2003 residential buildings with service residences for the elderly were classifield among three- and more dwelling buildings.

5.1.3 Renovation rate

The renovation rate of existing building can be determined as follows:

- **Via the statistical data on conversion and /or improvement building permits.**

According to Slovenian Construction Act the building permit is needed when renovation works influence structural elements, environmental impacts or the size of the building. When the renovation with building permit encompasses works on more than 25% of the external envelope area, then the major renovation is subject to comprehensive improvement of energy performance. Less complex works can be done without building permit as a part of regular or investment maintenance, however improvement of energy characteristics of building components and systems is mandatory. The renovation rate of existing buildings is thus 2,7% in 2011, 2,9% in 2010 3,1% in 2009 and 3,8% in 2005, respectively.

- **Via the number of subsidies annually allocated for energy renovation and integration of RES in buildings.**

According to the data of Eco fund, the national fund responsible for incentives for households, physical and legal persons, analysed and successfully concluded over 20.000 applications for subsidies in 2011, from that for over 15.700 clients were approved and 5.000 were rejected due to incomplete documentation. In general, in the subsidizing period 2008-2012 over 43.000 physical persons received subsidies. The most frequently applied measures were: solar thermal systems (8.400 applications), biomass boiler (5.411 applications), heat pump for central heating in residential buildings (2.415), HP for hot water (4.266), replacement of windows and doors (15.705), loft insulation (1.224 applications), mechanical ventilation with heat recovery (804 applications) as well as 411 passive house and 23 flats in passive apartment buildings.

Complete overview of the subsidized EE and RES measures in the building sector (Eco fund by Jan. 2013) is available in Table 6. In average approx. 10.000 households per year received a subsidy for one of the measures, that accounts for the 1,2% annual renovation rate in the subsidies scheme of Eco fund. Additional energy renovation measures are on-going also without subsidies.

Table 6: Overview of the allocated subsidies from Eco fund for nZEB, i.e. construction of very low energy and passive single family buildings and buying of flats in passive apartment buildings.

OVERVIEW OF SUBSIDIES PER MEASURES AND YEARS

SUBSIDIES - approved (in 1.000 EUR) by Eco fund														
Year	**2008**		**2009**		**2010**		**2011**		**2012**		**until 15.1.2013**		**Total 08-12**	
Measure	nr. of investments	investment	nr. of investments	investment	nr. of investments	investment	nr. of investments	investment	nr. of investments	investment	nr. of investments	investment	**nr. of investments**	**investment**
Total	**1.369**	**1.912**	**5.642**	**7.963**	**8.770**	**10.416**	**17.364**	**23.084**	**16.598**	**26.057**	**555**	**948**	**50.298**	**70.380**
RES	**1.226**	**1.528**	**3.101**	**3.806**	**2.330**	**2.424**	**7.306**	**6.647**	**11.037**	**11.166**	**398**	**461**	**25.398**	**26.032**
Solar thermal collectors	1.208	1.496	2.416	2.925	1.310	1.277	2.191	1.986	2.147	2.000	54	57	**9.326**	**9.741**
Heat pumps	5	11	25	57	403	339	3.162	1.974	5.165	3.780	185	183	**8.945**	**6.344**
Biomass boilers and boiler rooms	13	21	660	824	617	808	1.953	2.687	3.725	5.386	159	221	**7.127**	**9.947**
RUE	**143**	**384**	**2.541**	**4.157**	**6.440**	**7.992**	**10.058**	**16.437**	**5.561**	**14.891**	**157**	**487**	**24.900**	**44.348**
Instalation of EE roofs and doors	30	56	1.817	1.707	5.401	4.284	7.105	6.061	2.270	3.256	59	76	**16.682**	**15.440**
Thermal insulation of outer walls	38	92	420	959	710	2.651	1.750	6.608	1.980	7.680	58	280	**4.956**	**18.270**
Thermal insulation of roofs	34	28	113	80	174	174	588	663	559	678	12	14	**1.480**	**1.637**
Thermal insulation of ground floor	9	5	32	14	5	1							**46**	**20**
Fossil fuel boilers and boiler rooms	12	12	48	55	6	4							**66**	**71**
Energy efficient ventilation systems	4	6	10	14	69	133	364	698	516	857	21	37	**984**	**1.745**
Connection to biomass district heating									1	2	0	0	**1**	**2**
Construction of low energy and passive house + buying of of flats in passive blocks of flats	16	185	101	1.328	69	726	173	2.113	183	2.265	6	71	**548**	**6.688**
Hydraulic balance and thermostatic valves					3	14	40	228	31	122	1	9	**75**	**373**
Installation of heat metering and heat allocating devices					3	5	38	66	21	31			**62**	**102**

Source: Eco fund, 2013

- **Via the assumptions in the draft National energy programme - NEP 2030.**

There two strategic scenarios (reference – REF and intensive – INT) were assumed, and correspondingly the growing renovation rate in residential sector was foreseen:

Table 7: Renovation rate of building sector, foreseen in the reference and intensive strategy of draft National energy programme 2030 (Source: IJS and ZRMK).

Period	Renovation rate of existing residential buildings in % (draft NEP 2030)	
	REF	*INT*
2006-2008	2%	2%
2008-2015	2%	4%
2016-2020	3%	5%
2021-2025	4%	5%
2026-2030	4%	6%

5.1.4 Low energy buildings

Current status of very low energy buildings and passive houses (i.e. close to nZEB) in Slovenia can be obtained based on the scheme for subsidies of Eco fund in the period 2008-2012 and it is presented in the Table 8.

Table 8: ***Overview of the allocated subsidies from Eco fund for nZEB, i.e. construction of very low energy and passive single family buildings and buying of flats in passive apartment buildings***

Approved by 15.1.2013		Useful floor area		Subsidies [1.000 €]		Number of investments		Allocated incentives		Energy savings	Reduction of CO2 emissions
Measure: Subsides for very low energy buildings and passive house s	unit	Total	Apartment buildings	Total	Apartment buildings	Total	Apartment buildings	1.000 EUR	delež	MWh/leto	t/leto
Construction of low energy and passive houses	m2	91.947		5.802		485		5.802	88,81%	4.633	695
Buying of of flats in passive blocks of flats	m2	3.018	3.018	731	731	37	37	731	11,19%	168	25
TOTAL		**94.965**	**3.018**	**6.533**	**731**	**522**	**37**	**6.533**	**100,00%**	**4.801**	**720**

The number of low energy buildings, annual rate of new construction of energy efficient buildings and energy efficient renovations was estimated based on initial data on building stock from REN 2009, and based on the model developed for National energy plan (NEP 2030), while the typology and saving potentials were estimated based on IEE TABULA model.

Slovenian building stock is further classified in two condensed building types:

- SUH - single unit house,
- MUH - multifamily or multi-unit house,

and in 6 age classes:

- until 1945 (1) – pre WWII period,
- 1945 – 1970 (2) – after WWII period, no thermal regulations,
- 1971 – 1980 (3) – first national regulation on energy saving protection of buildings,
- 1981 – 2002 (4) – revision of regulation,
- 2003 – 2008 (5) – first energy performance calculation methodology based on European standards,
- from 2009 (6) – latest energy performance regulations

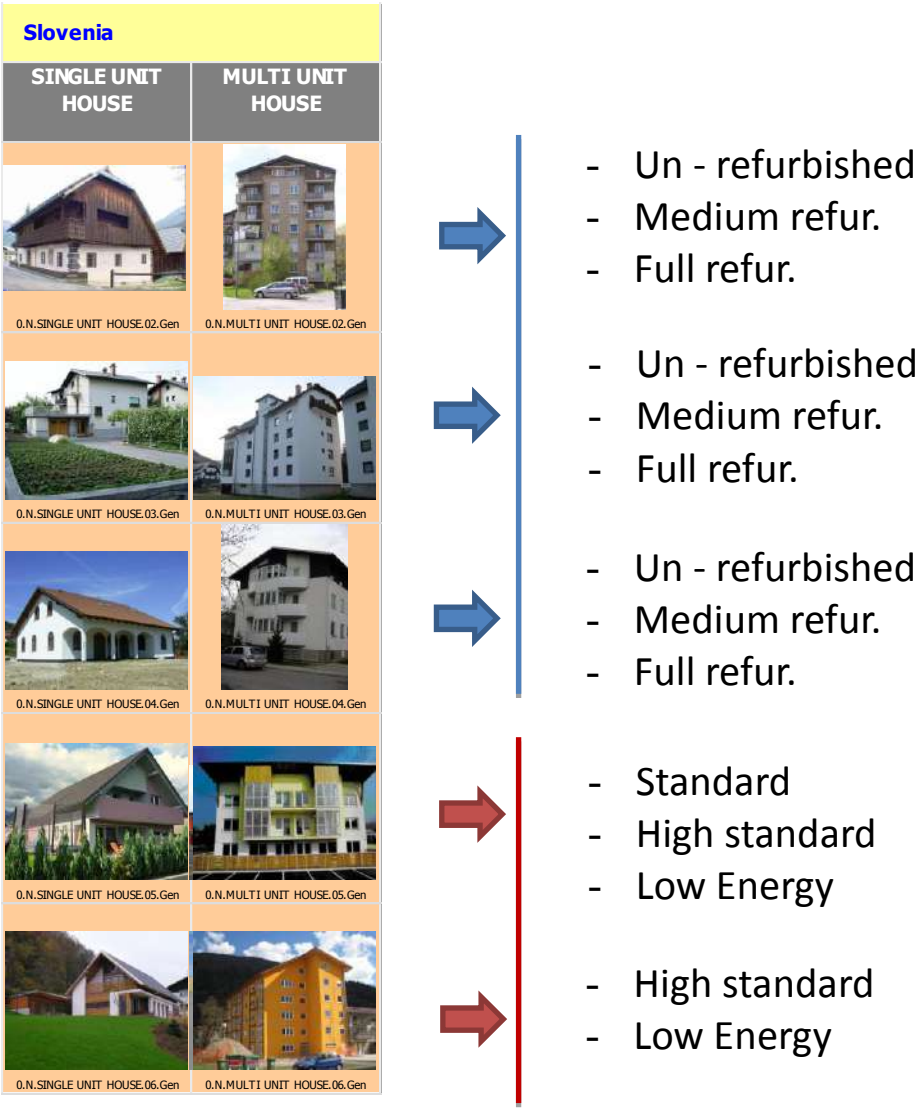

Figure 11: Division of primary building types into present state building types

Single unit buildings – SUB cover combining single family and terraced buildings, and multi-unit buildings - MUB cover multifamily and apartment buildings. First to age classes were grouped into single year class (until 1970), to finally get 5 age classes. This gives us 10 building types (Figure 11).

Primary building types describe original state of buildings at the time of erection. Since then buildings have changed and for the calculation of current national balance we have to take into consideration changed, refurbished, present buildings. Thus we investigated sub typologies. Subdivisions were made according to a) level of refurbishment (un-refurbished, medium or full refurbishment) or b) level of thermal protection of building at the time of erection (standard level, high standard level, or low energy level). Figure 11 shows these subdivisions.

Registry of buildings of Slovenia [REN] is a large database. It includes all Slovenian buildings with core information interesting for energy calculations. This are: year of building erection, area and utilisation of building part (apartment) , age of windows, roof and wall refurbishment, number of storeys and type of heat generation. The database is constantly updating, data used is from 2007.

Combination of information about the year of refurbishment of wall, roof and windows with the knowledge about the level of refurbishment at that time gave us an insight into today state of those buildings. These steps where made with some assumptions:

- Roof: half of refurbishment with no thermal improvement, before 2002 → 10 cm of thermal insulation, after 2002 → 20 cm of thermal insulation,

- Walls: before 1996 → 5 cm of thermal insulation, after 1996 → 8 cm of insulation,

- Windows: before 1996 → U = 2,7 W/m^{2}K, after 1996 → U = 1,4 W/m^{2}K.

Table 9: Frequencies of building types (% of useful floor area in 1.000 m^2) in 2011

Single Unit Buildings	Floor area in 1.000 m2	Tabula reference area in 1.000 m^2	% of SUH	**Multi-Unit Buildings**	Floor area in 1.000 m2	Tabula reference area in 1.000 m^2	% of MUH
SUH.01.Un_refur	9.790	10.769	18,9%	MUH.01.Un_refur	4.070	4.477	23,2%
SUH.01.Med_refur	10.314	11.345	19,9%	MUH.01.Med_refur	3.803	4.183	21,7%
SUH.01.Full_refur	4.238	4.661	8,2%	MUH.01.Full_refur	1.201	1.322	6,8%
SUH.02.Un_refur	5.302	5.833	10,2%	MUH.02.Un_refur	1.752	1.927	10,0%
SUH.02.Med_refur	3.137	3.450	6,1%	MUH.02.Med_refur	1.094	1.203	6,2%
SUH.02.Full_refur	1.101	1.211	2,1%	MUH.02.Full_refur	293	322	1,7%
SUH.03.Un_refur	8.615	9.476	16,6%	MUH.03.Un_refur	1.866	2.052	10,6%
SUH.03.Med_refur	3.947	4.342	7,6%	MUH.03.Med_refur	985	1.084	5,6%
SUH.03.Full_refur	518	570	1,0%	MUH.03.Full_refur	123	135	0,7%
SUH.04.Standard	1.673	1.840	3,2%	MUH.04.Standard	894	984	5,1%
SUH.04.High_stand	1.216	1.338	2,4%	MUH.04.High_stand	522	574	3,0%
SUH.04.Low_E	152	167	0,3%	MUH.04.Low_E	75	82	0,4%
SUH.05.High_stand	1.668	1.835	3,2%	MUH.05.High_stand	864	950	4,9%
SUH.05.Low_E	88	97	0,2%	MUH.05.Low_E	9	10	0,0%
	51.758	56.934	100%		17.549	19.304	100%

Source: REN 2009 – Real estate registry and IEE TABULA

The following tables show the information about thermal properties and properties of the systems per building type and per age category. This is a good starting point for estimation of energy renovation measures potential.

Table 10: Percentage of thermally refurbished envelope areas

Building classes	walls	roofs	upper floor ceilings	basement/ cellar ceiling	windows
Single Unit Houses					
SUH.01	38%	74%	38%	no data	84%
SUH.02	45%	74%	48%	no data	74%
SUH.03	38%	58%	49%	no data	46%
SUH.04	35%	34%	31%	no data	31%
SUH.05	20%	7%	9%	no data	0%
SUH.06	0%	0%	0%	no data	0%
Multi Unit Houses					
MUH.01	14%	55%	17%	no data	77%
MUH.02	16%	56%	21%	no data	52%
MUH.03	14%	38%	20%	no data	49%
MUH.04	26%	34%	18%	no data	27%
MUH.05	17%	0%	0%	no data	0%
MUH.06	0%	0%	0%	no data	0%

Source: REUS survey, 2011

Table 11: Information on insulation level of walls

	Thickness of exterior wall insulation layer (eg. mineral wall, polystyrene)				
Building classes	no insulation	less then 5 cm	from 6 to 10 cm	more then 10 cm	no data
Single Unit Houses					
SUH.01	53%	20%	14%	7%	7%
SUH.02	45%	16%	29%	7%	3%
SUH.03	34%	24%	34%	7%	2%
SUH.04	19%	24%	40%	13%	4%
SUH.05	10%	5%	52%	22%	11%
SUH.06	46%		17%	37%	
Multi Unit Houses					
MUH.01	73%	10%	3%	8%	7%
MUH.02	51%	17%	6%		26%
MUH.03	48%	15%	16%		21%
MUH.04	12%	28%	28%	5%	27%
MUH.05		34%	52%	14%	
MUH.06				100%	

Source: REUS survey, 2011

Table 12: Information on window types

	Windows type							
Building classes	Casement single glassing window	box window (2 Casement single window, between gap more then 10	box window (2 Casement single window, between gap less then 10	Casement double glassing window	Casement double low E glassing window	Casement triple low E glassing window	other	no data
Single Unit Houses								
SUH.01	13%	29%	18%	34%	1%	2%	1%	3%
SUH.02	8%	26%	14%	37%	10%	3%		2%
SUH.03	5%	24%	19%	35%	12%	4%		1%
SUH.04	5%	16%	19%	44%	11%	4%	1%	1%
SUH.05	2%	12%		23%	37%	15%		11%
SUH.06		37%		46%		17%		
Multi Unit Houses								
MUH.01	5%	33%		31%	21%	3%		7%
MUH.02	5%	40%	18%	30%	4%	2%	1%	
MUH.03	12%	11%	6%	63%	7%	1%		
MUH.04	15%	18%	12%	48%	8%			
MUH.05	17%			50%	17%		17%	
MUH.06					100%			

Source: REUS survey, 2011

Table 13: Information on insulation level of roof

	Thickness of roof insulation layer (eg. mineral wall, polystyrene)					
Building classes	no insulation	less then 5 cm	from 6 to 15 cm	from 16 to 30 cm	more then 30 cm	no data
Single Unit Houses						
SUH.01	50,80%	13%	17%	11%	1%	8%
SUH.02	44,60%	9%	29%	11%	1%	6%
SUH.03	27,50%	13%	39%	14%	2%	6%
SUH.04	34,50%	9%	31%	16%	3%	7%
SUH.05	11,40%	6%	25%	29%	10%	18%
SUH.06	45,70%		17%	37%		
Multi Unit Houses						
MUH.01	74,00%		7%	4%		15%
MUH.02	42,40%	4%	11%	5%	5%	34%
MUH.03	42,00%	8%	16%	2%		33%
MUH.04	8,30%	22%	26%	9%	1%	34%
MUH.05	16,80%	17%	27%	14%		25%
MUH.06				100%		

Source: REUS survey, 2011

Table 14: Overview of heating systems per type of heating system for space heating.

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
local heating, room heating	26%	9%	5%	5%	6%	0%	25%	10%	3%	7%	16%	0%
floor heating	12%	12%	6%	7%	3%	0%	27%	15%	14%	20%	33%	100%
central heating for building	61%	78%	87%	87%	91%	100%	33%	37%	37%	47%	42%	0%
district heating	0%	1%	3%	1%	1%	0%	14%	38%	46%	26%	9%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REUS survey, 2011

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
other heating	28%	15%	10%	8%	7%	11%	28%	27%	12%	8%	7%	6%
central heating	55%	78%	85%	85%	77%	84%	57%	53%	62%	67%	78%	72%
district heating	1%	2%	1%	1%	1%	3%	10%	16%	25%	23%	12%	17%
no heating	16%	5%	4%	6%	15%	1%	5%	3%	2%	2%	2%	6%
no data	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REN 2009 – Real Estate Registry, http://e-prostor.gov.si/?id=601

Table 15: Heat generation of space heating systems

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
old wood or coal boiler	45%	30%	35%	25%	20%	50%	26%	9%	2%	14%	0%	0%
old oil or gas boiler	32%	42%	42%	49%	37%	17%	53%	58%	84%	69%	86%	100%
low energy boiler	1%	0%	2%	2%	3%	0%	0%	3%	2%	0%	0%	0%
condensation boiler	0%	0%	1%	0%	6%	0%	0%	0%	0%	1%	0%	0%
new biomass boiler	4%	2%	4%	5%	11%	0%	7%	1%	2%	0%	0%	0%
electric heater	0%	2%	0%	0%	3%	17%	0%	3%	4%	2%	0%	0%
heat pump air-water	2%	2%	1%	1%	3%	0%	0%	0%	2%	0%	0%	0%
heat pump water-water	0%	0%	1%	1%	3%	0%	3%	0%	0%	7%	0%	0%
heat pump water-water	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
combined wood oil boiler	8%	18%	10%	10%	11%	0%	2%	6%	2%	4%	0%	0%
solar panels	1%	1%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%
other	8%	2%	3%	2%	3%	17%	9%	17%	2%	4%	0%	0%
no data	1%	0%	0%	0%	0%	0%	0%	3%	1%	0%	14%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REUS survey, 2011

Table 16: Overview of systems for preparation of domestic hot water

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
local	32%	15%	8%	9%	9%	13%	51%	44%	27%	24%	0%	0%
floor central	12%	11%	8%	10%	9%	0%	25%	16%	20%	27%	69%	100%
central	56%	72%	81%	80%	82%	88%	14%	14%	11%	32%	31%	0%
district heating	0%	1%	3%	2%	0%	0%	5%	25%	42%	17%	0%	0%
no data	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REUS survey, 2011

Table 17: Heat generation of domestic hot water systems

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
heat pump air-water	9%	7%	6%	8%	11%	0%	12%	0%	6%	11%	0%	0%
solar panels	5%	2%	5%	2%	6%	0%	0%	0%	0%	0%	0%	0%
electric heater	7%	6%	10%	8%	6%	33%	8%	27%	16%	4%	0%	0%
fow-through gas boiler	11%	5%	9%	8%	6%	0%	16%	7%	23%	28%	19%	0%
same as heating	65%	77%	69%	72%	72%	67%	52%	66%	55%	52%	81%	100%
other	2%	2%	2%	2%	0%	0%	12%	0%	0%	4%	0%	0%
no data	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REUS survey, 2011

Table 18: Ventilation systems

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
natural ventilation	100%	100%	100%	100%	92%	100%	100%	100%	99%	99%	100%	100%
mechanical ventilation (no heat recovery)	0%	0%	0%	0%	3%	0%	0%	0%	1%	1%	0%	0%
mechanical ventilation (with heat recovery)	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REUS survey, 2011

Table 19: Air conditioning systems

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
Cooling device installed	10%	13%	12%	20%	20%	22%	18%	11%	10%	32%	54%	0%
Cooling device not installed	90%	87%	88%	80%	80%	78%	82%	89%	90%	68%	46%	100%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: REUS survey, 2011

Table 20: Control of central heating systems

percentage of buildings per building class	Single Unit Houses						Multi Unit Houses					
	SUH.01	SUH.02	SUH.03	SUH.04	SUH.05	SUH.06	MUH.01	MUH.02	MUH.03	MUH.04	MUH.05	MUH.06
no regulation	38%	24%	22%	20%	21%	0%	30%	51%	40%	35%	17%	0%
termostatic valves only	21%	18%	24%	23%	29%	0%	18%	23%	44%	22%	0%	0%
room termostat - temperature control	23%	35%	22%	24%	12%	21%	29%	12%	15%	21%	27%	100%
room termostat - temperature and time control	10%	14%	24%	24%	33%	17%	8%	8%	0%	14%	56%	0%
outside temperature control	2%	3%	4%	3%	5%	17%	15%	3%	1%	5%	0%	0%
other	6%	6%	4%	7%	0%	46%	0%	4%	0%	2%	0%	0%
no data	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

5.2 Companies operating in the building sector

The table below present the main characteristics of the companies operating in construction sector. The data show that most of the enterprises in construction sector are small, as they employ up to 9 persons.

Table 21 Performance of enterprises in construction sector.

3.8 Poslovanje podjetij po dejavnosti in velikosti glede na število oseb, ki delajo, 2010
Performance of enterprises by activity and size classes by number of persons employed, 2010

	Skupaj *Total*	Velikost podjetij glede na število oseb, ki delajo *Size classes of enterprises by number of persons employed*					
		0–9	10–19	20–49	50–249	250+	
Število podjetij ***Number of enterprises***							
F Gradbeništvo	19190	17892	782	356	141	19	*F Construction*
Prihodki od prodaje (mio. EUR) ***Turnover (mio. EUR)***							
F Gradbeništvo	6024	1955	571	801	1541	1155	*F Construction*
Vrednost proizvodnje (mio. EUR) ***Production value (mio. EUR)***							
F Gradbeništvo	5670	1826	553	770	1456	1067	*F Construction*
Dodana vrednost v stroških faktorjev (mio. EUR) ***Value added at factor cost (mio. EUR)***							
F Gradbeništvo	1379	486	179	244	276	195	*F Construction*
Nabava blaga in storitev skupaj (mio. EUR) ***Total purchases of goods and services (mio. EUR)***							
F Gradbeništvo	4677	1535	403	575	1212	951	*F Construction*
Stroški dela (mio. EUR) ***Personnel costs (mio. EUR)***							
F Gradbeništvo	1093	305	150	182	260	195	*F Construction*
Število oseb, ki delajo ***Number of persons employed***							
F Gradbeništvo	77901	34974	10311	10830	13047	8740	*F Construction*
Število zaposlenih ***Number of employees***							
F Gradbeništvo	65044	22401	10077	10782	13044	8740	*F Construction*

Table 22. Legal persons in craft activities of construction sector.

Craft in activities in construction sector in 2012 Members of Chamber of crafts and small bussines Source: OZS, 2012	**Nr. of legal persons**	**Nr. of employees**
Organisation of construction works in buildings	2	6
Construction of residential and non-residential buildings	2.433	17.292
Road construction	146	3.870
Construction of bridges	48	401
Construction of infrastructure for liquids and gases	166	1.721
Construction of infrastructure for ICT	17	206
Demolition works	3	-
Preparatory ground works	408	905
Instataion of electricity networks and systems	1.860	7.286
Instalation of water, gas and heatung systems	1.361	4.016
Other instalation in construction works	544	1.674
Fasade, render and plaster decoration works	614	923
Instalation of windows and doors	1.966	1.699
Placing of floor and wall coverings	1.700	1.599
Glasier works	125	191
Painter	1.220	1.354
Other finalisation works	2.152	3.228
Instalation of roof structures and roofer works	585	1.351
Construction of engineering structures (non-building)	15	250
Other specialized construction works	1.216	2.838
Total (average: 3 employees/legal person)	**16.581**	**50.810**

5.3 Statistics of the current workforce in the building sector

The statistical data for the year 2010 on the persons employed in the construction sector, show that 4625 workers in construction of buildings are employed at natural persons, while 18312 workers in buildings are employed at legal persons Table 27.

Table 23. Persons in employment in construction sector (Sorce SORS, 2010).

Dejavnosti		Delovno aktivno prebivalstvo *Persons in employment*	Zaposlene osebe *Persons in paid employment* skupaj *total*	pri pravnih osebah *by legal persons*	pri fizičnih osebah *by natural persons*	Samozaposlene osebe *Self-employed persons* skupaj *total*	samostojni podjetniki posamezniki *individual private enterpreneurs*	osebe, ki opravljajo poklicno dejavnost *own account workers*	kmetje *farmers*	*Activities*
SKUPAJ		**835039**	**747194**	**685733**	**61461**	**87845**	**52987**	**6837**	**28021**	***TOTAL***
F	**Gradbeništvo**	78548	67481	52228	15253	11068	11067	-	-	***F Construction***
41	Gradnja stavb	24395	22936	18312	4625	1459	1459	-	-	*41 Construction of buildings*
42	Gradnja inženirskih objektov	13012	12901	12471	430	111	111	-	-	*42 Civil engineering*
43	Specializirana gradbena dela	41142	31644	21445	10199	9498	9498	-	-	*43 Specialized construction activities*

5.4 Energy consumption in buildings and use of RES

The Table 24 shows the planned share of RES in the buildings stock according to the NREAP 2010 – 2020. Unfortunately, the national statistics does not monitor the share of RES at a building level, only the share of RES in the national final energy use is recorded for the needs of NREAP 2010 – 2020.

For the needs of NEP 2030 the model was prepared based on the investigation of the building sector where the share of RES at a building level was estimated.

Table 24: Estimated share of RES in buildings according to NREAP 2010 – 2020 in %

[%]	2005	2010	2015	2020
Residential	32.6	38.9	49.0	54.1
Commercial	11.4	21.0	31.4	41.1
Public				
Industrial	17.1	18.0	19.8	22.1
Total	21.8	26.7	32.2	36.1

Table 25: Structure of energy use per particular building type (Source NEP 2030, IJS).

	(a) residential							
Energy carrier	**Total**	**% Use from each energy carrier**						
		Heating	Cooling	Hot water	Cooking	Lighting	Appliances	Other
Gas	1.189.745	72	0	25	3	0	0	0
Oil	3.666.428	80	0	13	6	0	0	0
Coal	10.915	84	0	16	0	0	0	0
Electricity	3.182.011	8	1	20	7	12	33	20
Biomass	3.770.326	83	0	14	2	0	0	0
Other RES	92.711	55	0	45	0	0	0	0
District HEAT	1.157.778	78	0	22	0	0	0	0
	(e) hospitals							
Energy carrier	**Total**	**% Use from each energy carrier**						
		Heating & Hot water	Cooling	Hot water	Cooking	Lighting	Appliances	Other
	MWh	%	%	%	%	%	%	%
Gas	11.310	100	0			0		0
Oil	212.558	100	0			0		0
Coal	0	0	0			0		0
Electricity	98.061	8	18			20		53
Biomass	839	100	0			0		0
Other RES	90	100	0			0		0
District HEAT	18.298	100	0			0		0
	(f) hotels and restaurants							
Energy carrier	**Total**	**% Use from each energy carrier**						
		Heating & Hot water	Cooling		Cooking	Lighting	Appliances	Other
Gas	14.403	100	0			0		0
Oil	121.167	100	0			0		0
Coal	0	0	0			0		0
Electricity	300.428	8	21			43		28
Biomass	992	100	0			0		0
Other RES	192.500	100	0			0		0
District HEAT	17.671	100	0			0		0
	(g) sports facilities							
Energy carrier	**Total**	**% Use from each energy carrier**						
		Heating & Hot water	Cooling		Lighting	Appliances	Other	
Gas	3.799	100			0		0	

Oil	71.398	100			0		0	
Coal	0	0			0		0	
Electricity	36.035	7			70		23	
Biomass	282	100			0		0	
Other RES	30	100			0		0	
District HEAT	6.146	100			0		0	
	(h) wholesale and retail trade services buildings							
Energy carrier	**Total**	**% Use from each energy carrier**						
		Heating & Hot water	Cooling		Cooking	Lighting	Appliances	Other
Gas	90.900	100				0		0
Oil	459.228	100				0		0
Coal	0	0				0		0
Electricity	1.544.345	3				48		49
Biomass	1.668	100				0		0
Other RES	1.439	100				0		0
District HEAT	29.709	100				0		0
	(i) other types of energy-consuming buildings							
Energy carrier	**Total**	**% Use per energy carrier**						
		Heating & Hot water	Cooling		Cooking	Lighting	Appliances	Other
Gas	13.833	100				0		0
Oil	1.670.470	100				0		0
Coal	0	0				0		0
Electricity	969.558	9				32		60
Biomass	5.809	100				0		0
Other RES	2.233	100				0		0
District HEAT	118.154	100				0		0

Due to very favourable conditions (feed in tariff) for PV power plants at buildings there was significant growth of PV plants in Slovenia. Although the power generated at the building site is sold to the grid, those plants represent over 200 MW and have thus already reached the target for 2020.

Table 26. Installed capacity of RES power plants in Slovenia

Power plant	year 2009			year 2010			Index 2010/2009
	Power generation [kWh]	Share in RES [%]	Share in total production [%]	Power generation [kWh]	Share in RES [%]	Share in total production [%]	
Hydro (up to 10 MW)	430.239.719	66,612	2,981	483.033.860	67,247	3,472	112,3
Biomass	97.943.961	15,164	0,679	100.756.071	14,027	0,724	102,9
Wind	218	0,000	0,000	10.666	0,001	0,000	4892,7
Solar	2.528.978	0,392	0,018	10.305.110	1,435	0,074	407,5
Biogas	78.276.053	12,119	0,542	96.269.047	13,402	0,692	123,0
Biomass co-burning (5 % to 90 %)	6.403.404	0,991	0,044	0	0,000	0,000	0,0
Municipal waste	30.501.352	4,722	0,211	27.918.645	3,887	0,201	91,5
Total RES	**645.893.685**	**100,000**	**4,476**	**718.293.399**	**100,000**	**5,162**	**111,2**

Table 27: Final energy consumption by energy source and year.

Energy source	2009	2010	2011
Extra light heating oil (t)	259910	256181	215200
Natural gas (1000 Sm3)	130307	139715	139112
Firewood (t)	1180649	1211762	1140664
Wood chips (t)	11808	12119	11408
Wood pellets (t)	4246	4358	4102
Wood briquettes (t)	2524	2590	2438
Wood waste (t)	23297	23911	22508
Liquefied petroleum gas (t)	34379	33199	35640
Electricity (GWh)	3137	3219	3211
Coal (t)	2679	1998	1380
District heat (TJ)	4022	4245	3742
Solar energy (TJ)	324	347	367
Geothermal energy (TJ)	464	582	764

Source: Statistical Office of the Republic of Slovenia, calculation, Jožef Stefan Institute - Energy Efficiency Centre (IJS-CEU).

According to the current development in growth of RES it is assumed that the binding target of 29% RES until 2020 will be reached. in 2012 the share of RES has already reached 20,5 %.

6 Existing VET provisions

6.1 Vocational and technical education programmes – current situation

The development strategy of vocational and technical education programme in Slovenia is defined in a document called White Paper, the same as for other types of education. The foundations of the present vocational and technical education system were laid down by the 1995 White Paper on Education in the Republic of Slovenia.

The White Paper laid down principles of vocational and technical education (hereinafter: vocational education) on which this type of education in Slovenia is based.

The principle of social partnership which involves systemic regulation of vocational education by coordinating the interests of employers, employees and ministries. Employers expect that the vocational education system will provide the labour market with appropriately qualified workers, and in addition, the employees have to be trained continuously as well. Employees organised in trade unions should be interested in being provided with sufficient general and basic knowledge by the education system in order to be able to implement their career and education ambitions and increase their competitive edge in the labour market. The ministries however, are the stakeholders in wider national interests aimed at the implementation of a broader lifelong learning concept and the provision of appropriate general knowledge to develop awareness on nationality and the ability to live in a democratic society.

The principle of lifelong learning in vocational and technical education is a challenge to set up a uniform system of education for youth and adults which means that individual learning paths should be provided throughout the system in order to introduce better opportunities for the selection of subjects and facilitate recognition of the previously acquired knowledge (also non-formal knowledge).

The principle of different paths leading to the same goal introduces different possibilities for the attainment of vocational competences required for successful performance of work, participation in continuing vocational training and pursuing new developments in the vocational field.

Evaluation of programme solutions which took place within the Phare Mocca European Project showed that several principles from the 1995 White Paper were not implemented consistently enough. In particular, the solutions frequently followed the well-known and well-established patterns from the past, and some solutions were even abandoned as inappropriate. The results of this evaluation prompted the drafting of a new development platform for lower and secondary vocational education programmes and secondary technical education programmes.

Based on the adopted platform, important changes were introduced in vocation, such as integration of general, technical theoretical and practical knowledge, module-based design of education programmes, practical training involving work practice as an important part of education, and introduction of an open part of the programme designed by the school in its role of education provider in compliance with the interests of social partners and economic sector in the local environment.

The structure of labour force in modern-organised companies reveals a need for upgrading vocational education on a higher level. Higher education programmes provide in-depth study of the vocational field since study programmes qualify the students for professional (applied) solutions to real problems faced by companies on a daily basis. The relationship between the number of full time and part time students indicates that many of them are already employed and search for such knowledge and skills in these programmes that they may be used immediately in their work. This confirms the fact that there is a high level of cohesion between higher vocational education programmes and labour market.

Higher education foresees module-based structure of study programmes and a practically orientated part of the curriculum. Higher education introduces the principles of lifelong learning associated with the secondary and tertiary education and stimulation of continuing education.

Social and economic changes and declining enrolment trends in vocational education programmes called for reconsideration of the education and training system and the setting up of strategies which are presented in the 2011 White Paper on Education in the Republic of Slovenia.

A comparative analysis with the vocational education systems in the EU Member States indicated the presence of the following trends in the EU countries:

- Strengthening the links between vocational education and the labour market;
- Raising the level of knowledge required for obtaining vocational education;
- Linking different education pathways (general — vocational, young — adults);
- Updating qualification systems in terms of adapting qualification frameworks and simplifying qualification structures.

Vocational education, particularly the secondary vocational education (in Europe and in Slovenia) is facing the trend of diminishing enrolment; moreover, this form of education has been losing its original purpose which was to prepare the students to enter the labour market directly. An increasing share of students (over 70% in the last years) has opted to continue the study in vocational and technical education programmes. This is probably also a consequence of low valuation of vocational education and jobs in certain industries which does not stimulate enrolment in this kind of education programmes. At the same time however, labour market analyses reveal an exceptionally high demand for vocations trained in secondary vocational education programmes. The demand for these vocations exceeds the demand for vocations trained in secondary vocational programmes in all technical fields.

Vocational education followed by technical upgrade (3+2 – VTE) was first conceived as education aimed at attaining higher practical and particularly theoretical level of vocational education. This kind of education is concluded by the vocational Matura, the same as in technical education programmes (lasting for 4 years). Analyses revealed that there were obvious differences in the knowledge of students taking vocational Matura after the completed secondary vocational - technical education and the students coming from technical education programmes. The passed vocational Matura gives access to post-secondary education or entry on the labour market.

All the above mentioned facts indicate that certain systemic changes may be expected in the forthcoming years, particularly in secondary VTE education and secondary technical education.

6.2 National professional qualifications

An increasing demand of employers for appropriately educated and trained personnel has intensified competition among individuals to obtain and keep their employment. This has led to the search for new systemic opportunities for the recognition of knowledge and skills regardless of the contexts in which they were acquired.

The certification system for obtaining and validating non-formal and informal vocational knowledge, skills and experiences was introduced by the National Professional Qualifications Act. It lays down the acquisition of professional qualifications through the verification system for acquired knowledge, skills and competences. The fast pace of economic development, in particular of new technologies and services, has fostered the development of new professional qualifications in new vocational fields, of non-formal and informal learning, of key competences and qualification framework. The framework will enhance more efficient and flexible use of an individual's skills and knowledge and will integrate the vocational pathways of acquiring qualifications into a single transitive and transparent system.

6.3 Survey of the Slovenian qualifications framework

The Report on Introduction of the European Qualifications Framework for Lifelong Learning, adopted in 2008, recommended to the EU Member States to relate their national qualification levels to the

levels of the European Qualifications Framework (EQF) by 2010, and to introduce them in all new Europass certificates, diplomas and documents by 2012.

The main purpose and goal of the EQF is to facilitate the translation between different qualifications systems. It contains 8 reference levels defined by the expected learning outcomes — knowledge, skills and competences, which the EQF defines as responsibility and self-direction. As an instrument for the promotion of lifelong learning and mobility, EQF spans the full range of qualifications from the basic level to doctoral level. Every level should be attained through different pathways of education and career development.

Different bodies, authorities and support services were activated for the purpose of setting up the Slovenian Qualifications Framework (SQF). The Ministry of Labour, Family and Social Affairs ordered the implementation of an European Social Fund project titled the Slovenian Qualifications Framework (2009-2013), which is led by the Centre of the Republic of Slovenia for Vocational Education and Training (Center RS za poklicno izobraževanje). At the beginning of 2010, the Slovenian Government appointed an inter-ministerial group for the preparation of the national qualifications framework in accordance with the European Qualifications Framework, and laid down its composition and main tasks which also make the inter-ministerial group the highest decision-making body in the SQF development.

In October 2010, this group adopted (by consensus) a draft proposal of the Slovenian Qualifications Framework which was prepared by an expert team set up for this purpose. In February and March 2011, the draft proposal was presented to various stakeholders (employers, trade unions, ministries and representatives of the national education and higher education system).

The SQF draft proposal seeks to incorporate the national characteristics of Slovenian education system and labour market. It is compatible with the guidelines of the European Qualifications Framework and strives for the transparency of qualification systems in Slovenia, taking into consideration the national context and relying on the Classification System of Education and Training (hereinafter: KLASIUS). It is composed of 10 levels and it facilitates the integration of education and qualification structures in Slovenia by containing both the concept input of education activities and the concept output of learning outcomes, which is in line with its central role of qualifications framework.

6.3.1 Draft proposal of the Slovenian Qualifications Framework

The Table 28 shows education and national qualification system relating to the levels in the Slovenian Qualifications Framework

Table 28: Draft proposal of the Slovenian Qualifications Framework

	OF EDUCATION	OF NATIONAL QUALIFICATION SYSTEM
LEVEL 1	Unfinished primary education	
LEVEL 2	Primary education	NQF, level 2
LEVEL 3	Lower vocational education	NQF, level 3
LEVEL 4	Secondary vocational education	NQF, level 4
LEVEL 5	Secondary technical and general education	NQF, level 5
LEVEL 6	Higher education	NQF, level 6
LEVEL 7	Specialisation after higher education (before 11 June 2004) Higher technical education University education (1st stage)	
LEVEL 8	Specialisation after higher technical education (before 11 June 2004)	

	University education (before 11 June 2004) Master degree in vocational/technical field	
LEVEL 9	Specialisation after university education (before 11 June 2004) Master degree in science	
LEVEL 10	PhD degree in science	

Vocational standards were developed at the Centre for Vocational Education and Training (CPI) which function as a link between the vocational education system and the national professional qualifications certification system. Vocational standards are developed on the basis of incentives put forward by interested legal entities. Developing vocational standards is a demanding project which brings together several partners, employers' and employees' organisations, responsible ministries and schools. National and sectorial development documents have to be considered as well as data submitted by the Slovenian Employment Service (Zavod RS za zaposlovanje) and the Statistical Office of the Republic of Slovenia (Statistični urad RS), and examples from EU Member States.

6.4 Qualifications structure in the area of "construction of energy efficient buildings, energy restoration and efficient use of energy in buildings"

Vocational standards are classified into 8 broader groups based on International Standard Classification of Education (ISCED), with subgroups inside. When classifying vocational standards into groups, it has become increasingly difficult to place them within a single field because vocations are getting more and more interdisciplinary in nature.

In the area of construction of energy-efficient buildings, energy-saving building restoration and efficient energy use in buildings, we often come across the intertwining of several professional fields, which further aggravate the above mentioned problem. In addition to traditional vocations, new vocations which are increasingly interdisciplinary in nature, are emerging. This was also the reason why the Sustainable Development Sectoral Committee (Področni odbor za trajnostni razvoj) was subsequently set up dealing with vocational standards particularly in terms of their impact on sustainable development of both the natural environment and the society.

In Slovenia the area of energy efficient construction and energy restoration of buildings has not been addressed in uniform fashion therefore it appears as a multidisciplinary area involving the professional fields of the building sector, mechanical engineering, electric power sector and wood economy.

If we set out to prepare a qualifications structure covering the area of construction of energy efficient buildings, energy restoration of buildings and efficient energy use in buildings, we have to prepare some transversal components of the existing qualification structures based on traditional segmentation. The newly formed qualifications structure should then be expanded by incorporating those areas from the ISCED classification that relate to the construction and rehabilitation of buildings and efficient use of energy.

6.5 Occupational standards

Occupational standard is a document containing generic and key competences, typical works, knowledge and skills that are characteristic of a particular vocation. It is the basis for the preparation of an education and training programme or a national professional qualification. The decision is adopted by the responsible sectorial committee, taking consideration of the proposal submitted by the vocational standard proposer.

When surveying the Occupational Standards Database we encounter the following occupational standards related to the construction of energy-efficient buildings and energy-saving building restoration at different exigency levels (from level IV to Level VI).

Occupational standards at exigency level IV:

- Bricklayer
- Carpenter
- Insulation installer
- Floor layers and tile setters
- Painter
- Tiller
- Roof plumber
- Joiner
- Glazier
- Fitter of ventilation and air-condition equipment
- Fitter of mechanical installations
- Fitter of intelligent installations
- Electrician
- Electronics technician

Occupational standards at exigency level V:

- Construction technician
- Operator of automatic compounds/plants
- Systemic electrician
- Operator of energy equipment and systems
- Laser technology operator
- *Fitter of photovoltaic systems* *
- *Fitter of thermal systems* *
- *Fitter of solar systems* *

Occupational standards at exigency level VI:

- Civil engineer
- Electricity technologist
- Wood technologist
- *Energy operator of buildings* *

Denominations of Occupational standards written in italics (*) refer to standards which are still in the process of preparation.

6.6 Education programmes

Education programmes at the level of vocational and technical education were reformed in accordance with the methodology prescribed by the Development platform for lower and secondary vocational education programmes and secondary technical education programmes, and by the Development platform for education programmes in higher technical schools.

Characteristics of education programmes:

- Module-based structure of education programmes means that modules contain closely intertwined knowledge and practical skills or know-how. Integration of knowledge and skills facilitates the development of generic and professional competences.
- Competence-based programmes are based on knowledge and skills listed in occupational standards as the fundamental document for the preparation of education programmes. The implementation of programmes is participant-oriented and focused on the attainment of his learning outcomes and the development of his capabilities for the performance of tasks in a particular vocational or technical field.
- The open part of education programmes is not determined on the national level and encompasses 20% of the entire programme. The providers of education programmes are left to decide on the contents of the open part in accordance with the interests and needs of the local environment and economic sector. This provides for the flexibility of education programmes by enabling the incorporation of contemporary knowledge and new technology developments in the programmes without having to resort to the programme adoption procedures on the national level.
- Credit validation of programme units facilitates their recognition and transfer to the formal education system. One credit point corresponds to a 25-hour work input by an education participant.
- Practical training with employers is a mandatory part of all secondary vocational and technical education programmes. The purpose of this training is mainly to learn about the real working environment and vocational socialisation.

In Slovenia, education programmes which relate to the construction of energy-efficient buildings, energy-saving building restoration and efficient energy use in buildings in terms of their content and vocational competences developed by the students, are as follows:

The level of secondary vocational education, where education programmes take 3 years:

- Bricklayer
- Carpenter
- Erector of prefabricated building
- Fitter of mechanical installations
- Electrician
- Joiner
- Tiller – setter of ceramic claddings
- Roof plumber
- Painter
- Glazier

The level of secondary technical education, where education programmes take 4 years, and the level of vocational and technical education, where education programmes take 2 years and are attended by the students who successfully completed the secondary vocational education:

- Construction technician
- Mechanical technician
- Electrical technician
- Wood technician

The level of higher technical education, where education programmes take 2 years:

- Civil engineering
- Mechanical engineering
- Electrical engineering
- Wood engineering

At the national level, education and study programmes are so structured that they allow the selection of subjects and provide the education provider with the option to determine, within the open part of the programme, the content that is of current relevance in the fast-paced development of professional fields and/or adapted to the needs of the local environment.

The open part of the programme (open-curriculum) allows the incorporation of new developments and the latest trends in professional fields, thus facilitating faster adaptability of education to the labour market requirements.

We noted some open-curriculum modules in the secondary vocational and technical education programmes. Their titles indicate that they address the subjects of energy-efficient construction of buildings and energy restoration of buildings. Thus there are open-curriculum modules titled:

- Solar systems,
- Renewable energy sources,
- Energy-saving house,
- Bio and passive houses,
- Efficient use of energy,
- Designing building fittings,
- Alternative energy sources,
- New materials in building industry, etc.

The table Table 29 shows the data on the Survey of enrolment in education programmes from the 2007/2008 school year.

Table 29: Enrolment of students in the first year of secondary education programmes related to construction of energy efficient buildings and energy restoration (Source: CPI)

SCHOOL YEAR	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012**
Enrolment in 1st year of secondary schools	22544	21915	21737	21266	20949
Secondary vocational education (SVE)					
Bricklayer	38	46	53	31	4
Carpenter	25	19	14	19	6
Erector of prefabricated building	9	10	8	3	11
Tiller — setter of ceramic claddings	101	78	81	81	87

Painter	39	41	41	41	31
Joiner	284	257	280	296	242
Roof plumber	4	1	8	11	10
Fitter of mechanical installations	123	131	133	158	146
Electrician	317	291	241	239	221
Total (SVE)	***940***	***874***	***859***	***879***	***758***
%	*4,17*	*3,99*	*3,95*	*4,13*	*3,62*
Secondary technical education (STE)					
Construction technician	256	291	253	193	167
Mechanical technician	635	739	666	566	587
Electrical technician	368	372	420	375	406
Wood technician	92	119	109	118	82
Total (STE)	***1351***	***1521***	***1448***	***1252***	***1242***
%	*5,99*	*6,94*	*6,66*	*5,89*	*5,93*
Vocational and technical education (VTE)					
Construction technician (VTE)	94	81	86	95	89
Mechanical technician (VTE)	568	467	524	452	364
Electrical technician (VTE)	400	377	323	217	263
Wood technician (VTE)	240	167	174	138	173
Total (VTE)	***1302***	***1092***	***1107***	***902***	***889***
%	*5,78*	*4,98*	*5,09*	*4,24*	*4,24*
All					
Total 1st year – all	3569	2953	2895	2753	2446
%	*36,48*	*36,98*	*38,24*	*32,76*	*36,34*

The above data indicate that enrolment in the secondary vocational, secondary technical and vocational and technical education programmes related to energy-efficient construction, energy-saving building restoration and efficient use of energy has been diminishing in the last five years. Particularly noticeable is a drop in enrolment in the past year which is undoubtedly closely related to the crisis that in the recent years affected the building sector and other industries engaged in the construction or restoration of buildings.

Young population in Slovenia has very low interest for enrolment in secondary vocational education and training (VET) programmes (STE - secondary technical education VTE - vocational technical education SVE - secondary vocational education). Constant drop of enrolment was identified from 15,8% population in 2007/2008 to 11,7% in the year 2011/2012. This drop is particularly noticeable in occupations of construction sector (only 4 bricklayers and 6 carpenters started the initial education in 2011) while the enrolment in the programmes mechanical technician and fitter of mechanical installations dropped only moderately. The upgrade of curricula in initial VET is important but it cannot

have a major impact on improvement of EE competences of blue collar workers that are on the labour market.

Enrolment trends in the secondary vocational education programmes are comparable with the trends occurring in comparable EU Member States. The development documents of Slovenia have acknowledged the vocational and technical education as an important part of education that will foster further development of industries; therefore measures to keep the enrolment on at least the present level are expected to be adopted.

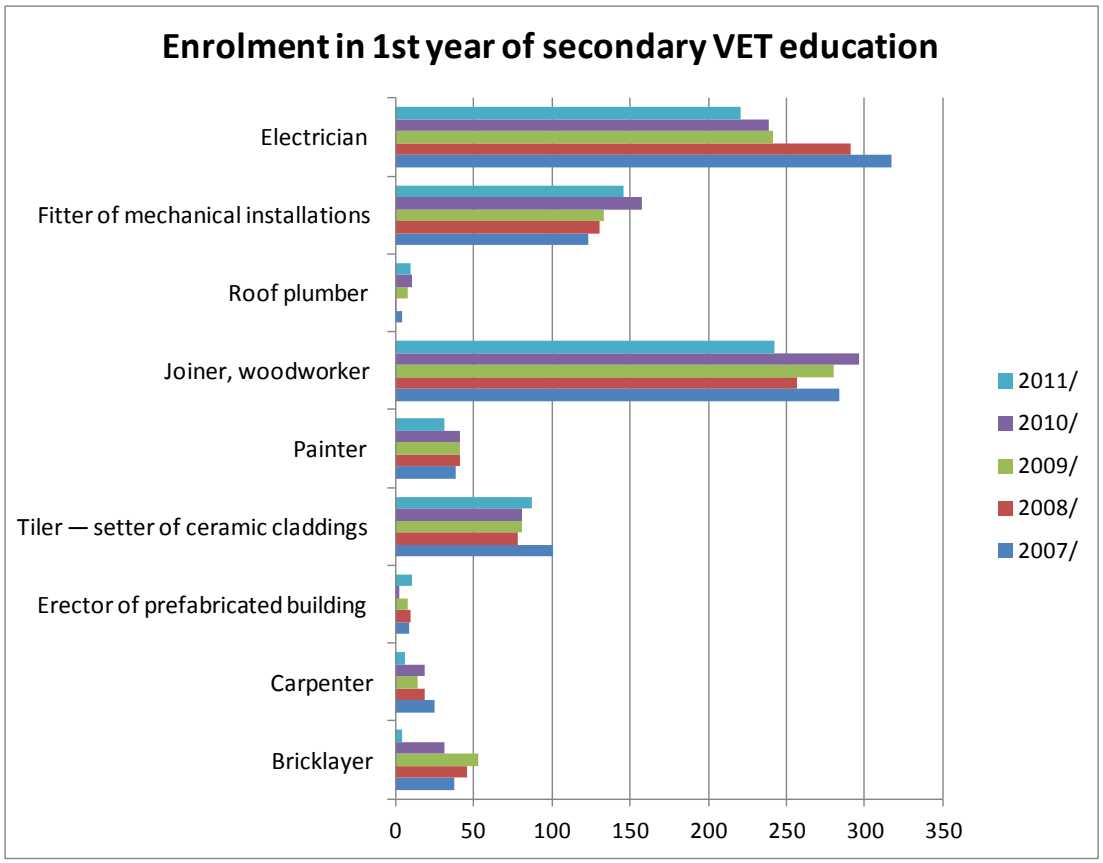

Figure 12: Enrolment (number of students) in the first year of secondary education programmes related to construction of energy efficient buildings and energy restoration (Source: CPI)

In the figure bellow shows the share of RUE and RES topics in professional modules of educational curricula. The topics are presented in detail in Annex 13.1.

Table 30: Skills for energy efficiency and renewable energy measures in current curricula of secondary technical and vocational education.

Educational programmes / occupations	Nr. of hours for RUE and RES	Nr. of hours in professional modules of curriculum	Share of RUE and RES in professional modules of education
MECHANICAL ENGINEERING			
Mechanical technician (STE)	288	2209	13,04%
Mechanical technician (VTE)	250	1594	15,68%
Fitter of mechanical installations (SVE)	110	1356	8,11%
Roof plumber (SVE)	15	1198	1,25%

Joiner of metal structures (SVE)	13	1212	1,07%
Assistant in technological processes (LVE)	20	3800	0,53%
CIVIL ENGINEERING			
Environmental protection technician (STE)	171	2142	7,98%
Construction technician (STE)	60	1705	3,52%
Bricklayer (SVE)	17	1502	1,13%
Tiller - setter of ceramic claddings (SVE)	17	1307	1,30%
Carpenter (SVE)	17	1242	1,37%
Erector of prefabricated buildings (SVE)	17	1307	1,30%
Chimney sweeper (SVE)	22	1307	1,68%
ELECTRICAL ENGINEERING			
Electrical technician (STE)	0	3482	0,00%
Electrician (SVE)	25	1468	1,70%

Legend:

STE - secondary technical education

VTE - vocational technical education

SVE - secondary vocational education

LVE - lower vocational education

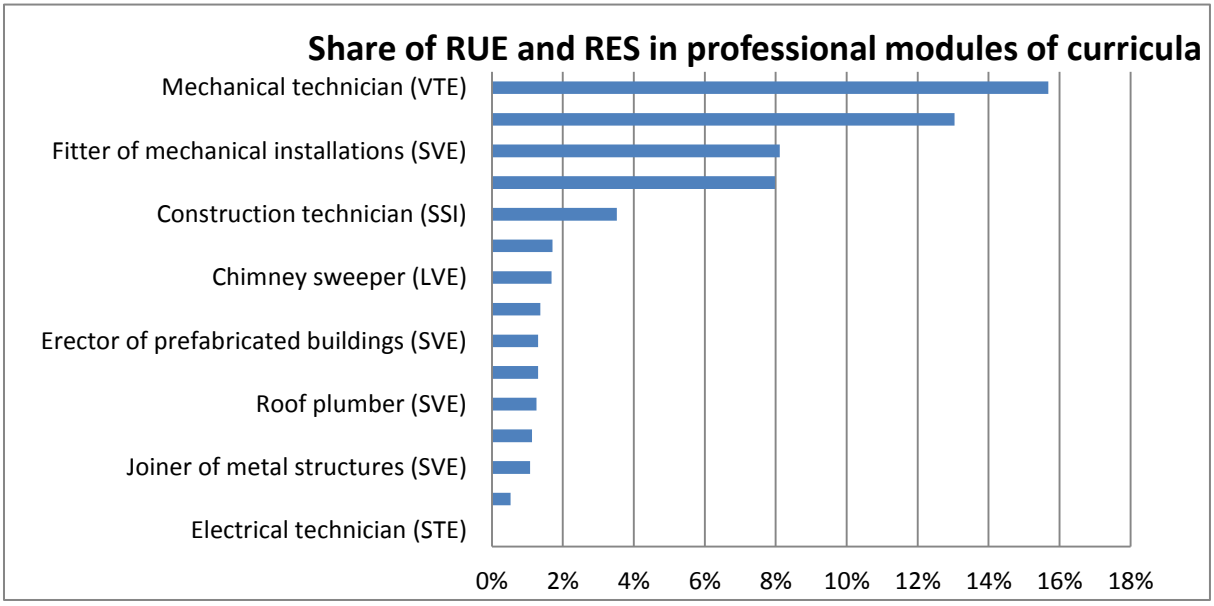

Figure 13: Share of lessons on skills for energy efficiency and renewable energy measures in current professional part of curricula of secondary technical and vocational education.

For more detailed overview of the curricula, please see Annex 13.1.

6.7 Monitoring of market developments

The interest for energy efficient building and the use of renewables started to grow in late 90-ties with the introduction of energy efficiency policy and with the implementation of financial incentives, information and awareness raising and various training programmes.

The rapid development was identified after the transposition and implementation of EPBD based building regulation in 2008 (PURES 2008). Currently, the most comprehensive overview of the market development in terms of installation of RES and RUE technologies is available at Eco fund (www.ekosklad.si), central national institution giving subsidies to the end users.

Since 2009 the development of RES and RUE in households is followed also by a poll REUS (http://www.pozitivnaenergija.si/reus/). The comprehensive poll end users attitude to energy use, EE of existing buildings, heating, cooling, use of electricity and mobility is based on on-site interviews with national representative sample of home owners. The penetration of advanced technologies for energy efficiency as well as renovation plans of the building owners are monitored on a yearly basis.

The skills requirements for construction of nZEB buildings and in installation of energy efficient and RES technologies and corresponding training needs are monitored by Chamber of crafts and small businesses (http://www.ozs.si/ozseng/Sectionscommittees.aspx), where its professional sections (successors of guilds) inter alias support the introduction of modern technologies, provide for regular and supplementary professional training of its members, and promote rational use of energy and protection of the environment.

6.8 Courses and trainings of complementary VET

In Slovenia, there is no central register and system of validation or accreditation of the courses and training schemas on energy efficiency and renewable energies in buildings. There is no organisation responsible for collection, validation, accreditation and auditing of organisations performing these trainings. A limited scope of data in this regard has been acquired by interviews in construction sector, within the national workshops and according to information available to Build up Skills Slovenia partners.

Although – as our interviews and the results of national workshops show – there are a large number of EE/RES trainings on the market. Many of them can be considered professionally prepared and implemented, and supported by experts from institutes in particular technical field and experts in training and education.

The interviews with 41 experts from construction and electrical installation (Table 31) show that intensive (in number of trainees) additional trainings and educations has been implemented in 2011. They reported of 2.730 employees attending different trainings, with more than 20.000 hours spent on training (see Table 32).

Table 31: Evidence of respondents to the poll on complementary VET courses.

Scope	Statistics Category	Designers, Supervisors	Manufacturers, Suppliers	Installers	Investors	Total
G - Construction	No. of Respondents	5	4	5	6	20
	Rate	25,0%	20,0%	25,0%	30,0%	100,0%
E -Electrical Installation	No. of Respondents	9	5	10	3	21
	Rate	33,3%	18,5%	37,0%	11,1%	100,0%

Table 32: Overview of complementary VET courses and number of participants (N=41 respondents).

No.	*Item / Scope*	*No. of Participants*	*Total hours*
G2	**CONSTRUCTION MATERIAL**	**720**	**4.400**
	Bricks	350	2.800
	Aerated Concrete Blocks	120	600
	Hydro Insulation	250	1.000
G3	**THERMAL INSULATION SYSTEMS**	**1.585**	**12.680**
	Thermal Insulation	760	6.080
	Facade Systems	825	6.600
G4	**DOORS, WINDOWS AND SHADING SYSTEMS**	**425**	**3.400**
	PVC Doors and Windows	220	1.760
	Wooden Doors and Windows	120	960
	Roof Windows	85	340
	TOTAL	**2.730**	**20.480**

A large number of trainings are prepared and executed by producers of materials and products (insulation materials, bricks, windows), systems (facades, roof system), HVAC and electrical installations, and machines and equipment for installation. Some of them run intensive, targeted trainings which include also the basic information about theory, demonstration part and practical trainings. They have also with good training facilities, with mock-up installations, internal certification and timeline of required trainings in specific period of time.

More general trainings in particular technical novelty or in field of policies and regulation are organised by institutes such as Building and Civil Engineering Institute ZRMK, National Building and Civil Engineering Institute, Chamber of Crafts, Chamber of Industry, Chamber of Architects, Chamber of Engineers or branch associations.

Examples of complementary VET courses organized by industrial actors are listed below::

- Facades, insulations, hydro insulations (FGRAGMAT, FIBRAN, WEBER, JUB),
- Managing daily light (SOLTEC),
- EE house, now technologies in EE/RES (Faculty of Architecture, Passive house Consortium, other providers)
- Good practices in EE/RES (ZRMK, Vitra)
- Blower door tests implementation
- Installation of windows (AJM, MIK Celje...)
- Brick EE houses (Wienerberger Opekarna Ormož d.o.o.)
- HVAC (UPONOR - TITAN Kamnik, Weishaupt d.o.o. Celje, Vaillant d.o.o., Termotehnika Braslovče d.o.o.)

- Measurements of electrical installation (METREL)
- External lighting (PHILIPS).

The detail programmes of these trainings are available for attendees. Some of them are available only for particular customers, e.g. installers installing brand of organisation providing training.

Since there is no systematic classification of these kind of trainings of the market, the analysis of this area is a difficult task, especially if we take into consideration protection of IPR.

6.9 Relevant initiatives at national/regional level supported by the EU:

There are several on-going EU project that put a strong focus on capacity building of various target groups of stakeholder of nZEB and EE renovation.

The following EU projects in particular focus on training of on-site workers in either educational curricula or in the informal training schemes:

- GEIOPOWER, INTERREG IVC 2007-2013 – training of geothermal heat pump installers
- IEE INTENSE – training of on –site workers in renovation of buildings
- IEE ENFORCE – training of energy auditors
- IEE Install RES – installer of RES systems,
- IEE IDES-EDU – training for nZEB (www.ee.fs.uni-lj.si/celica)
- IEE MOVIDA – training for inspection of heating systems
- IEE EUCert – training of heat pump installers

6.10 Employment analysis in the area of energy efficiency in buildings in the period 2007 – 2011

In surveying the demand for occupations that may be ranged in the area of energy-efficient construction and efficient use of energy, we relied on the Standard Classification of Occupations. We made a selection of occupations falling within the above mentioned area. Our analysis covered the employers' demand for these occupations in the period 2007 — 2011. The selection of 54 occupations at different exigency levels. The list of selected occupations included in the analysis is given in Table 33.

Table 33: Selection of occupations from the Standard Classification of Occupations (SCO), included in the analysis referring to the area of energy-efficient construction

SCO code	Occupation, SCO denomination
2142.01	Civil engineer
2142.01	Building construction engineer
2142.04	Construction materials technologist
2144.01	Mechanical engineer
2144.01	Mechanical engineer, constructor
2149.01	Wood engineer
2151.01	Electrical engineer

SCO code	Occupation, SCO denomination
3112.01	Construction technician
3112.01	Construction technician for hydro construction
3112.01	Building construction technician
3113.06	Technician for electricity
3113.06	Electrical technician
3115.01	Mechanical technician
3123.03	Construction technician, works manager
3131.01	Operator of bio energy equipment
3131.04	Operator of gas energy equipment
3131.05	Operator of solar energy equipment
3131.06	Operator of thermal energy equipment
3131.07	Operator of energy equipment
7112.01	Bricklayer
7112.01	Bricklayer for bricklaying and plastering
7112.04	Tiller
7115.01	Carpenter
7115.04	Building joiner
7121.01	Roof plumber
7121.01	Roofer
7122.01	Floor layer
7122.02	Parquet layer
7122.03	Ceramic tiles setter
7123.01	Erector of prefabricated building
7123.03	Façade erector
7124.01	Insulation installer
7124.02	Insulation installer of fittings and installations
7125.01	Glazier
7125.02	Building glazier
7126.02	Fitter of heating equipment
7126.02	Installer of heating equipment
7126.03	Fitter of gas equipment
7126.03	Installer of gas equipment
7127.01	Fitter of refrigerating and air-condition equipment

SCO code	Occupation, SCO denomination
7127.01	Installer of air-condition equipment
7127.01	Fitter of refrigerating equipment
7127.01	Installer of air-condition equipment
7127.02	Fitter of ventilation and air-condition systems
7127.02	Installer of air-condition systems
7129.03	Erector of prefabricated houses
7129.04	Fitter of builders' joinery
7129.04	Installer of builders' joinery
7131.01	Decorator
7131.01	Painter
7213.02	Building plumber
7411.01	Electrical installer
7411.01	Electrical fitter, specialist
7522.01	Joiner

Source: ESS - Employment Service of Slovenia (Zavod RS za zaposlovanje — ZRSZ),databases

Table 34 contains a general overview of the structure of demand for certain occupations in the area of energy-efficient construction by year. In addition, we also included permanent and fixed-term employments. Fixed-term employment is one of the forms of flexibilisation of work. The trend of fixed-term employment which has started during the period of Slovenian economic decline is continuing. The percentages of permanent and fixed-term employments reveal how secure the jobs in certain occupations are.

Table 34: Structure of demand for occupations in the area of energy-efficient construction by year and by employment period, 2007 — 2011

Year	Demand (in numbers)	Share (%)	Permanent employment (%)	Fixed-term employment (%))
2007	19312	23.50	26.03	73.97
2008	17924	21.81	25.33	74.67
2009	11569	14.08	19.47	80.53
2010	12408	15.10	17.54	82.46
2011	20961	25.51	13.29	86.71
Total	**82174**	**100.00**	**20.42**	**79.58**

Source: ESS - Employment Service of Slovenia (Zavod RS za zaposlovanje — ZRSZ), databases

The table (Table 34) shows a picture which, in terms of permanent and fixed-term employments, has been characteristic for Slovenia in the past few years. The relationship between the two forms of employment has been increasing in favour of fixed-term employments during the recent years. In 2007, the relationship between permanent and fixed-term employments was at its peak to the benefit

of secure (permanent) employments, if compared to the years 2009 and 2010, when the number of employments in Slovenia declined in general due to the economic crisis. In 2011, the number of employments rose again and even exceeded the level reached in 2007; however, many of these employments were fixed-term contracts. This means that many employment contracts were concluded just for the period of a specific project implementation, or the employers kept renewing the contracts for the same workplace. Employers have to register every renewal of employment contract with the Employment Service of Slovenia as if it were a new employment. This creates a misleading impression of new jobs being offered whereas in reality the same jobs or workplaces are involved.

Presented on the page 68 is a survey of demand for every occupation included in the area of energy-efficient construction and the prospects of permanent or fixed-term employment for each of them (Table 35).

The economic and financial crisis that hit the global (and Slovenian) economy, has also had a great impact on the number of job vacancies. The increasing trend of employers' demand for workers that we had witnessed since 2004 came to a stop in the autumn of 2008 and became reversed soon afterwards. In 2010, the situation began to improve and 8.2% more job vacancies were registered than the year before, but in comparison with 2007, when job vacancy rate was at its peak, the overall number was still lower by 28.1%.

Almost one third of all employments are offered to bricklayers, but their chances for a permanent contract are very slim indeed. It may be presumed that the employers want to engage bricklayers for the period of a specific project implementation with the possibility of contract renewal. In 2010, the sharpest decline of the number of persons in active employment was recorded in the building industry. At the end of 2010, 72.090 persons were in active employment in the building industry, which is more than 11.000 less than at the end of 2009 — a staggering 13.4 % drop —, the highest recorded in all economic activities (Source: 2010 Annual Report, Employment Service of Slovenia).

The next most sought after occupation is carpenter, accounting for 12% of all demand for occupations in the area of energy-efficient construction. All the remaining occupations listed in Table 3 amount to less than 10% of the total demand. In terms of permanent employment contracts, mechanical engineers, electrical engineers, civil engineers, wood engineers and technologists for building materials have the best prospects. The prospect of secure employment for these occupations is approximately 40%.

Table 35: Structure of demand for workers in the area of energy-efficient construction by year and by employment period, 2007 — 2011

SCO, 6 digits *- occupations	Demand (in numbers)	Percentage (%)	Permanent (%)	Fixed-term (%)
7112.01 Bricklayer	22565	27.46	13,40	86,60
7115.01 Carpenter	9574	11.65	11,82	88,18
7411.01 Electrical installer / electrician	7528	9.16	15,74	84,26
7131.01 Painter	6417	7.81	20,02	79,98
7522.01 Joiner	5517	6.71	28,42	71,58
3115.01 Mechanical technician	3933	4.79	27,28	72,72
2144.01 Mechanical engineer	3592	4.37	41,12	58,88
7123.01 Erector of prefabricated building	3407	4.15	17,17	82,83
3113.06 Technician for electricity	2277	2.77	29,16	70,84

SCO, 6 digits *- occupations	Demand (in numbers)	Percentage (%)	Permanent (%)	Fixed-term (%)
7121.01 Roof plumber	2139	2.60	25,53	74,47
7123.03 Façade erector	2081	2.53	13,50	86,50
2151.01 Electrical engineer	1848	2.25	44,37	55,63
3112.01 Construction technician	1779	2.16	31,48	68,52
7126.02 Fitter of heating equipment	1719	2.09	23,79	76,21
2142.01 Civil engineer	1219	1.48	42,00	58,00
7124.01 Insulation installer	1064	1,29	12,78	87,22
7122.03 Ceramic tiles setter	901	1,10	24,08	75,92
7127.01 Fitter of refrigerating and air-condition equipment	717	0,87	20,08	79,92
7115.04 Building joiner	559	0,68	19,50	80,50
7122.01 Floor layer	515	0,63	21,94	78,06
7127.02 Fitter of ventilation and air-condition systems	423	0,51	37,83	62,17
2149.01 Wood engineer	414	0,50	41,79	58,21
7213.02 Building plumber	391	0,48	28,64	71,36
3123.03 Construction technician, works manager	348	0,42	41,95	58,05
7129.04 Fitter of builders' joinery	281	0,34	22,42	77,58
7124.02 Insulation installer of fittings and installations	250	0,30	30,80	69,20
7122.02 Parquet layer	224	0,27	31,25	68,75
3131.07 Operator of energy equipment	147	0,18	35,37	64,63
7126.03 Fitter of gas equipment	107	0,13	21,50	78,50
2142.04 Construction materials technologist	75	0,09	42,67	57,33
7125.02 Building glazier	61	0,07	26,23	73,77
7125.01 Glazier	33	0,04	9,09	90,91
7112.04 Tiller	28	0,03	10,71	89,29
3131.01 Operator of bioenergy equipment	17	0,02	29,41	70,59
3131.06 Operator of thermal energy equipment	10	0,01	30,00	70,00
3131.04 Operator of gas energy equipment	8	0,01	50,00	50,00
7129.03 Erector of prefabricated houses	6	0,01	33,33	66,67
Total	**82174**	**100.00**	**20.42**	**79.58**

*denominations are grouped by identical SCO codes; the older denomination is kept

**denomination 3131.05 Operator of solar energy equipment does not appear in the demand

Source: ESS -Employment Service of Slovenia (Zavod RS za zaposlovanje — ZRSZ), databases

According to the latest data for 2010 of the ESS - Employment Service of Slovenia (Source: 2010 Annual Report of the Employment Service of Slovenia), the greatest number of job vacancies (19.7%) of the total registered job vacancies (34.425) were offered by the employers in manufacturing industries. They were followed by employers in the building industry who were seeking 23.858 workers, which is by 5.3% less than in 2009. Trade sector and maintenance and repair of motor vehicles occupy the third place, registering 22,979 job vacancies, which is by 0.9% less than the year before.

Moreover, the data indicated in Table 36show that the majority of occupations in the area of energy-efficient construction belong to the group of occupations in construction. The leading economic activity is construction of residential and non-residential buildings, which is logical considering the data from Table 35 bricklayers ranked first. Construction activities also prevail among other activities of the employers who inquired after the occupations pertaining to energy-efficient construction. The building industry in Slovenia is the third largest sector in terms of employment. This industry is also marked by a very high fluctuation rate. In 2011, the Employment Service of Slovenia recorded a rise in construction job vacancies, but this was mostly due to smaller employers who sought workers for work abroad. The highest share of fixed-term employment contracts is recorded precisely in the building industry. Usually this share increases with the lowering of required education level, which is a characteristic feature of the construction sector. The industry is well-known for employing foreigners and this trend particularly increased during the period of economic boom (Source: Building industry at the time of the crisis, Employment Service of Slovenia, 2011). A new economic activity has emerged recently, i.e. temporary workers brokerage. These are agencies that search for appropriate personnel, employ them and find them jobs with firms that hire them.

Table 36: Structure of demand for workers in the area of energy-efficient construction by employer's activity (Standard Classification of Activities - SCA), period of employment, together for the period 2007 — 2011

Employer's activity (SCA), 4 digits code)	Demand (in numbers)	Percentage (%)	Permanent (%)	Fixed-term (%)
41.20 Construction of residential and non-residential buildings	15822	19,25	12,72	87,28
43.39 Other completion and finishing construction works	4402	5,36	10,13	89,87
43.21 Installation of electrical wiring and fittings	2885	3,51	19,03	80,97
43.99 Other construction work involving special trades	2677	3,26	17,93	82,07
43.34 Glazing and painting	2329	2,83	16,32	83,68
78.20 Temporary workers brokerage	2125	2,59	8,47	91,53
43.91 Erection of roof covering and frames	1976	2,40	20,39	79,61
43.33 Floor and wall covering	1542	1,88	18,35	81,65
71.12 Technical designing and related consulting	1524	1,85	26,51	73,49
25.62 Mechanical metal working	1518	1,85	12,71	87,29
43.32 Joinery installation	1360	1,66	21,99	78,01
43.31 Plastering	1334	1,62	11,09	88,91
43.22 Plumbing, gas and heat installation	1317	1,60	28,63	71,37
16.23 Builders' joinery and carpentry	1035	1,26	28,02	71,98
43.29 Other building installation	1009	1,23	11,00	89,00
70.22 Other entrepreneurship and business	962	1,17	16,32	83,68

consulting				
25.11 Manufacture of metal structures and their parts	903	1,10	18,94	81,06
Other	18142	22,08	26,86	73,14
Total	**82174**	**100,00**	**20,42**	**79,58**
missing*	19312	23,50	26,03	73,97

Source: Employment Service of Slovenia – ESS (Zavod RS za zaposlovanje — ZRSZ), databases

*current classification of activities of business entities and parts thereof has been used since 2008; the "missing" represent the demand in 2007

6.11 Detailed survey by occupations in the area of energy-efficient construction for the period 2007 – 2011

Presented hereinafter is a detailed survey by ESS of occupations particularly in terms of the following selected variables:

- Employer's activity
- Period of employment
- Statistical region
- Demand by year

By means of the selected variables, we aimed at obtaining data on the activity of employers who seek a particular occupation, and the share of permanent and fixed-term employments; we were interested whether a worker's work experience is important for employers, which statistical regions the employers come from, and demand trends through the years. Every occupation is accompanied by a brief comment. Comments were omitted in experience required contrasted with the period of employment (permanent/fixed-term), because the relationships between the required work experience and permanent or fixed-term employments did not differ significantly.

7112.01 Bricklayer

Employers inquiring after bricklayers are mainly engaged in the Construction of residential and non-residential buildings (38%), followed by Other building completion (9%) and Other construction work involving special trades (5%). Other activities account for less than 5% of the demand. The relationship between the employers who (do not) require work experience and permanent or fixed-term employment is not considerably different. Employers mainly come from the largest, Central Slovenia region, followed by Savinja and Podravje regions. The demand for bricklayers was diminishing since 2007; however, in 2011 it even exceeded the demand in 2007. The workers are recruited mostly from abroad.

7115.01 Carpenter

A good third of employers who wanted to employ a carpenter is engaged in the Construction of residential and non-residential buildings (31%). The relationship between permanent and fixed-term employments and superior work experience is similar as in the case of bricklayers. Here again the majority of employers are registered in the Central Slovenia region, and a high percentage of employers have head offices in Savinja and Podravje regions. The demand in 2011 exceeded the demand in 2007 by approximately 15%.

7411.01 Electrician

The major activity of employers who wanted to employ electricians is Installation of electrical wiring and fittings (31.20%). Second-ranked are agencies hiring workers for other firms (6.6%). The major part of employers offering employment to electricians comes from Podravje region (41.5%). The demand for electricians dropped considerably in 2009 and 2010 and began to rise again in 2011.

7131.01 Painter

Glazing and painting is the main activity employing painters, followed by the Construction of residential and non-residential buildings. Half of such employers are registered in Podravje and Central Slovenia regions, followed by Savinja region and then Pomurje region (11%). The demand for painters has been decreasing since 2008.

7522.01 Joiner

Employers' activities launching demand for joiners are Builders' joinery and carpentry, Manufacture of furniture for business and commercial premises, Manufacture of other miscellaneous furniture, Joinery installation and Manufacture of kitchen furniture. The majority of employers come from the Central Slovenia region, followed by Podravje, Gorenjska and Savinja regions. The demand for joiners was declining through the years, hitting the bottom in 2009.

7123.01 Erector of prefabricated building

Employers searching for erectors of prefabricated building were engaged in construction activities, followed by the employers engaged in Joinery installation. One third of the companies had head offices in Podravje region, one third in the Central Slovenia region and 24% in Savinja region. A considerable rise in the demand for erectors of prefabricated buildings was recorded in 2011.

7121.01 Roof plumber

A good half of the employers seeking to employ roof plumbers are engaged in Erection of roof covering and frames. One third of employers have head offices in Savinja region, followed by Podravje region and then the Central Slovenia region. The demand for roof plumbers was decreasing but improved slightly in 2011.

7123.03 Façade erector

27.6% of employers seeking façade erectors were engaged in Construction of residential and non-residential buildings, followed by Plastering. Most employers come from the Central Slovenia region, Podravje region and Savinja region. The lowest demand for façade erectors was recorded in 2009 (181 inquiries) and the highest demand was recorded in 2011 (1,069 inquiries).

7126.02 Heating fitter

The activity prevailing among the employers seeking to engage heating fitters was Plumbing, gas and heat installation. The largest number of employers was registered in Podravje, Central Slovenia and Savinja regions. The sharpest decline in demand was recorded in 2009, but the trend was improved in 2011.

7124.01 Insulation installer

The majority of employers seeking to employ insulation installers were engaged in Other building installation. Most of them had head offices in the Central Slovenia, Podravje and Pomurje regions. Demand for insulation installers has been increasing.

Based on the above survey wit can be summarize that the prevailing activity of employers employing workers from the field of energy-efficient occupations is Construction of residential and non-residential

buildings. **Unfortunately, the** w**ork experience does not represent an important condition for obtaining the employment.** The share of fixed-term contracts in occupations covering the area of energy-efficient construction is high. The highest demand for these occupations was recorded on the part of employers coming from the largest region, i.e. Central Slovenia region, and Podravje region.

7 Skills gaps between the current situation and the needs for 2020

7.1 Labour force evolution

The labour force employed in the sector of energy efficient building, nearly zero energy buildings and energy renovation of existing buildings is estimated based on the overview of labour market in construction sector, planned measures in NEEAP and NREAP for building sector as well as the situation in the field of formal and informal VET.

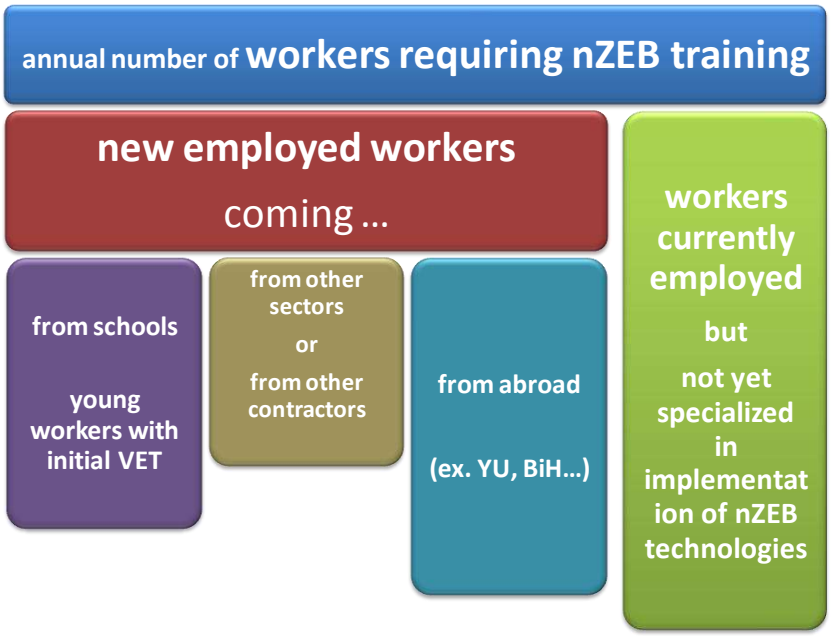

Figure 14: Schematic presentation of nZEB labour force evolution by 2020 .

7.1.1 Young person successfully passing formal VET programmes

In the Table 37 and Table 38 there is an overview of the number of persons, that have successfully completed formal vocational and other professional education and training (related to building sector). In the year 2011 a group of 779 persons successfully completed the secondary vocational education by passing the final exam; and 1492 persons successfully completed the secondary professional education by passing the vocational baccalaureate.

Unfortunately, the national statistics has got no data on the number of newly qualified VET workers that have successfully completed initial VET (IVET) education and also entered the labour market by doing their occupations. For further analysis of skills gaps in the Build up Skills it was assumed that approximately a half of the young VET educated persons actually work in the construction sector.

Table 37: *The number of all candidates that passed final VET exam in 2011.*

Educational programme	Educational programme - level	Successfully passed final exam in 2011
ELECTROTECHNICS		
Electrician	SVE	248
Electrician - power	SVE	12
MECHANICAL ENGINEERING		
Fitter of mechanical installations	SVE	75

Roof plumber		3
Joiner of metal structures	SVE	11
Assistant in technological processes	LVE	104
CIVIL ENGINEERING		
Bricklayer	SVE	28
Tiller — setter of ceramic claddings	SVE	51
Carpenter	SVE	14
Erector of prefabricated building	SVE	7
Chimney sweeper	SVE	20
Painter	SVE	43
Graphic painter	SVE	1
Stonecutter	SVE	1
WOOD ENGINEERING		
Joiner	SVE	161
		779

Table 38: *The number of all candidates that passed vocational baccalaureate in 2011*

Educational programme	Educational programme - level	Successfully passed vocational baccalaureate in 2011
ELECTROTECHNICS		
Electrical technician	SPI	269
MECHANICAL ENGINEERING		
Mechanical technician	SPI	830
CIVIL ENGINEERING		
Construction technician	SPI	228
WOOD ENGINEERING		
Wood technician	SPI	165
		1492

Legend:

SVE - secondary vocational education (level IV)

LVE - lower vocational education (level III)

SPI - secondary professional education (STE and VTE, level V)

STE - secondary technical education

VTE - vocational technical education

7.1.2 Current status of labour force

Statistical data about the employment in the construction sector (ESS, Gradbeništvo v času krize, 2011) show that the number of persons employed in the sector slightly decreased from the peak in 2008 (87.000 employed) to approx. 70.000 employed in 2011. No major changes were observed in employment in the sector in 2012.

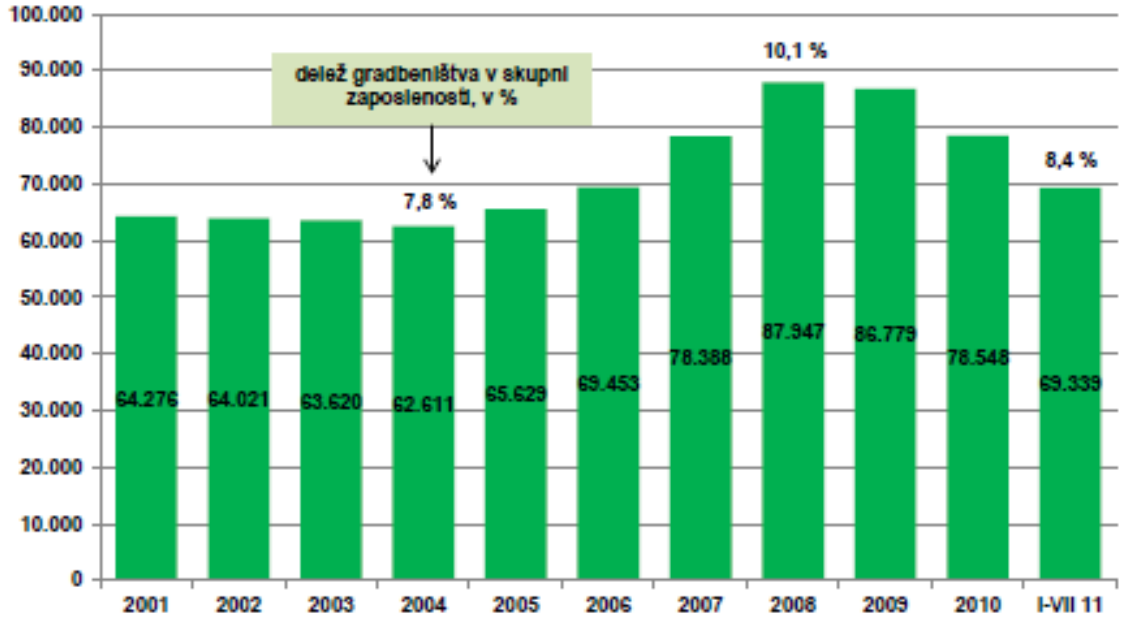

Figure 15: Persons working in building sector and share in total number of employed persons in Slovenia. (Source: ESS, 2011).

According to the data of Chamber od crafts and small business (OZS) the majority of the workers working in building sector is employed in craft like plants: 16.107 plants were working in building / construction sector in the year 2010 with 36.687 employees and with 2,3 employees per plant. 12.296 plants are independent entrepreneurs with less than one employees and other group are economic companies, i. 4.285 with 21.462 employees (5,0 employee per plant).

Big construction companies were transformed in the crisis, many of them stopped the operation due to bankruptcy. In 2010 they employed the remaining 22152 employees in construction sector.

Table 39: Employees and craft plants according to their status – construction sector.

DELAVCI V OBRTNIH OBRATIH (2006 - 2010) **CRAFT PLANTS AND EMPLOYEES ACCORDING TO STATUS**									
	SAMOSTOJNI PODJETNIKI **INDEPENDENT ENTERPRENEURS**			GOSPODARSKE DRUŽBE IN OBRTNE ZADRUGE **ECONOMIC COMPANIES**			SKUPAJ **TOTAL**		
	obrati **plants**	zaposleni **employees**	zap./obr. **emp./pla.**	obrati **plants**	zaposleni **employees**	zap./obr. **emp./pla.**	obrati **plants**	zaposleni **employees**	zap./obr. **emp./pla.**
2006	11632	14190	1,2	2775	19232	6,9	14407	33422	2,3
2007	12515	16400	1,3	3128	20460	6,5	15643	36860	2,4
2008	12864	17613	1,4	3581	23756	6,6	16445	41369	2,5
2009	12750	14962	1,2	4257	23530	5,5	17007	38492	2,3
2010	12296	11829	1,0	4285	21462	5,0	16581	33291	2,0
AVERAGE	12411	14999	1,22	3605	21688	6,10	16017	36687	2,30
SD	488	2208	0,15	672	1953	0,81	1026	3442	0,19

In the Table 40 based on the estimation of the profiles of employed and the respective activities of construction companies and craft plants, the number of employed in construction sector and working on EE and RES and nZEB related works is determined, i.e. 42.160 of employees.

The respective activities listed in Table 40 were taken from the company/plant registration data, i.e. not all employees in plants operating in construction of residential and non-redisential buildings. The BUS team composed of experts in this field estimated the share of workers for nZEB training in this group to 30% (5.188). Total number

As the available data refer primarily to plants on crafts and small business, i.e. in total 50.180 workers employed and considering the current status of total employees in construction sector is **72.962, the** difference of 22.152 workers is working for big construction companies. For further analysis it is estimated that the share of workers that need training is equal as in the rest of sector (in craft plants), i.e.12.800 workers. Therefore the total number of workers that need training for nZEB in the period 2012-2020 is estimated to 42.160, i.e. to 6.023 per year.

Trainings may differ in form, length and nZEB competences to be covered..

Table 40: Training needs per main activities of the craft plants and companies.

ACTIVITIES IN CONSTRUCTION SECTOR IN 2012 FOR PLANTS - MEMBERS OF CHAMBER OF CRAFTS AND SMALL BUSSINESES Source: OZS, 2012	**NR. OF PLANTS**	**NR. OF EMPLOYEES**	**ESTIMATED NZEB TRAINING NEEDS EMPLOYEES**
Organisation of construction of building projects	2	6	
Construction of residential and non-residential buildings	2.433	17.292	5.188
Road construction	146	3.870	
Construction of bridges and tunnels	48	401	
Construction of bridges and roads	166	1.721	
Construction of infrastructural object for liquids and gases	17	206	
Construction of infrastructure for electricity and ICT	3	0	
Preparatory earthworks	408	905	
Installing of electrical and other appliances	1.860	7.286	7.286
Installing of water pipes, gas and heating pipelines	1.361	4.016	4.016
Other installing works in construction	544	1.674	1.674
Facade and plaster works	614	923	923
Installing windows and doors	1.966	1.699	1.699
Claddings of walls and floors	1.700	1.599	1.599
Glassier works	125	191	191
Painting works	1.220	1.354	1.354
Other finalization works in construction	2.152	3.228	3.228
Erecting the roof structure and tinsmith-roofer's works	585	1.351	1.351
Construction of infrastructural works	15	250	
Other specialized works in construction	1.216	2.838	851,4
Total in »Crafts and small business«	16581	**50.810**	**29.360**

Total in »Big construction companies« (reduced in 2012 - crisis and transformation of sector)		**22.152**	**12.800**
Total employees in construction sector in 2012		**72.962**	
Training needs by 2020			**42.160**
Training needs per year			6.023

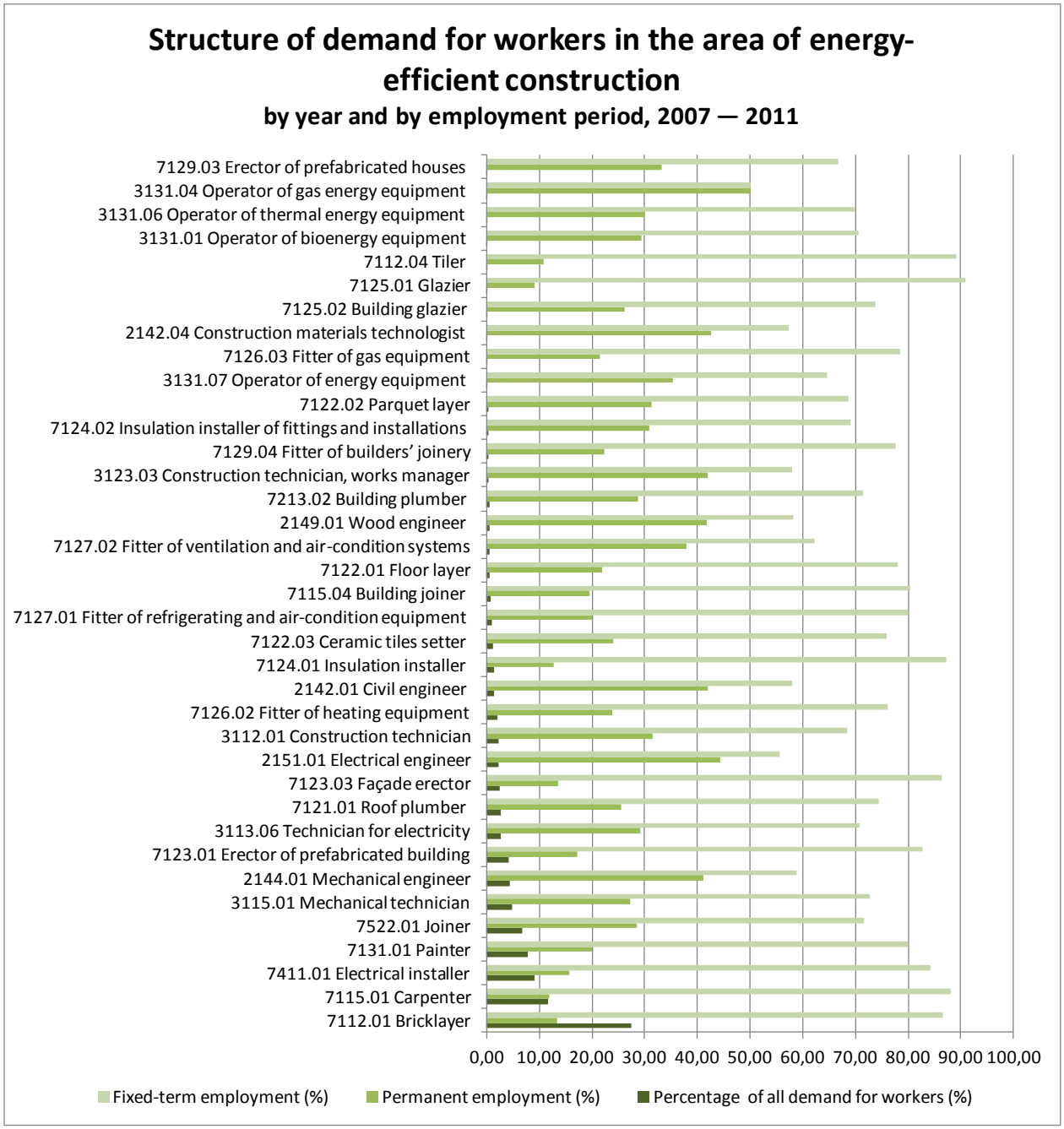

Figure 16: Structure in demand for workers in the area of energy efficient construction activities (Source: ESS)

The initial structure of demand for workers in construction of nZEB and implementation of nZEB technologies is assumed based on the demand for workers in nZEB related activities in current period. 10 most interesting occupations are listed below:

7112.01 Bricklayer

7115.01 Carpenter

7411.01 Electrical installer / electrician

7131.01 Painter

7522.01 Joiner

3115.01 Mechanical technician

2144.01 Mechanical engineer

7123.01 Erector of prefabricated building

3113.06 Technician for electricity

7121.01 Roof plumber

7.1.3 Growth forecast 2020

The forecasted growth of construction sector in Slovenia by 2020 is moderate . Based on the data in NEP 2030 (draft National energy plan 2030) the growth of construction of non-residential buildings (all tertiary) by 2020 is 12,6% in the period 2010 - 2020, while the growth in construction of residential sector (due to the ageing of population) is 11,5% in the period 2010 - 2020.

For in the period 2010 – 2020 the forecasted net demand of additional workforce for nZEB up-skilling we therefore assume the overall rate of 12%. (.i.e. 0,12 x 42.000 = 5.040 workers)

Table 41: Anticipated growth of new buildings by 2030, according to the draft National energy plan 2010-2030 (Source: NEP 2010-2030 and IJS)

Growth of buildings areas in % per year	**2008**	**2010**	**2015**	**2020**	**2025**	**2030**
Residential		yearly growth in % (period 2008-2010)	yearly growth in % (period 2011-2015)	yearly growth in % (period 2016-2020)	yearly growth in % (period 2021-2025)	yearly growth in % (period 2026-2030)
All residential buildings	**63.902.000**	**1,29%**	**1,28%**	**0,96%**	**0,69%**	**0,44%**
75% of floor area - single family	47.926.500	1,29%	1,28%	0,96%	0,69%	0,44%
25% of floor area - apartment buildings	15.975.500	1,29%	1,28%	0,96%	0,69%	0,44%
Non-residential						
All	**22.414.458**	**1,56%**	**1,21%**	**0,97%**	**0,79%**	**0,71%**
All public sector	7.999.827	1,08%	0,90%	0,78%	0,61%	0,57%
All tertiary	14.414.630	1,83%	1,38%	1,07%	0,88%	0,79%
All residential + non-residential	86.316.458	1,36%	1,26%	0,96%	0,71%	0,51%

Useful floor area m2	2008	2010	2015	2020	2025	2030
Residential						
All residential buildings	**63.902.000**	**65.546.000**	**69.741.000**	**73.088.000**	**75.594.000**	**77.264.000**
75% of floor area - single family	47.926.500	49.159.500	52.305.750	54.816.000	56.695.500	57.948.000
25% of floor area - apartment buildings	15.975.500	16.386.500	17.435.250	18.272.000	18.898.500	19.316.000
Non-residential						
All	**22.414.458**	**23.114.233**	**24.514.406**	**25.701.197**	**26.710.436**	**27.661.627**
All public sector	7.999.827	8.173.347	8.542.625	8.875.022	9.143.644	9.403.120
All tertiary	14.414.630	14.940.887	15.971.783	16.826.175	17.566.792	18.258.508
All residential + non-residential	86.316.458	88.660.233	94.255.406	98.789.197	102.304.436	104.925.627
Source: prognosis from draft NEP 2030, IJS						

7.1.4 Training needs by 2020

The number of workers requiring training by 2020 is composed of the number of workers currently employed but not yet specialized in implementation of nZEB technologies and of the number of new employed workers that either come from IVET or from other sectors or from abroad (Figure 14)

Number of workers currently employed but not yet specialized in implementation of nZEB technologies was estimated based on the overview of existing labour force in national statistics (SORS) and based on the data from OZS. For realistic estimation of training needs the *What-Where-Who* approach was used. The number of 42.000 persons was selected on *What* principle – job of these employees is construction and renovation of buildings (as estimated based on the main statistical activity of their company or craft plant). 42.000 employees represent the upper limit of training needs. Further on the number of potential trainers was reduced on the Where principle (i.e. 2/3 of employees are working on construction site) and also by *Who* principle (approx. ½ of workers are VET workers, while the rest are engineers or unskilled workers). That finally leads to a realistic number of 13.600 on-site workers that need training for nZEB.

7.2 Skills needs

In addition to previously described estimation of training needs of on-site workers leading to the rough and conservative estimation, an additional assessment was done based on the detailed list of necessary measures planned in NEEAP 2011.2016 for building sector. An additional benefit of this approach is that one can obtain better insight into the necessary profiles of skilled workers involved in the subsidized measures. The estimations based on the list of 2020 Targets measures represent the lowest scenario of training needs, as it refers only to subsidized (part of) measures.

Table 42: Estimation of number of trained workers per year (based on the assumptions in "Second NAEEP 2011-2016")

Estimation of number of trained workers per year (based on the assumptions in "Second NAEEP 2011-2016")	Renovation / construction planned per year (Au m2) from "Second NAEEP 2011-2016"	Amount of units of specific works planned per year (m2 wall insulation, boilers...)	Workers per team	Duration of works per unit (wall, system)	Amount of works per unit (wall, system)	Effective days per year	Units done per year by 1 team	Teams needed per year	**Workers needed on-site per year (by 2016)**	**Trainers needed Per year (by 2016)**
Financial incentives for energy-efficient renovation and sustainable construction of residential buildings (measure G.1)										
SFH wall insulation	600.000	720.000	5	8	122	200	25	235	1176	59
SFH replacement of windows	600.000	120.000	4	3	26	200	67	71	282	14
SFH loft and other elements	600.000	200.000	4	5	71	200	40	70	280	14
MFH wall insulation	200.000	160.000	12	20	531	200	10	30	361	18
MFH replacement of windows	200.000	40.000	4	40	133	200	5	60	241	12
MFH loft and other elements	200.000	100.000	8	10	266	200	20	19	151	8
New low energy and passive buildings wall insulation other	30.000	36.000	6	20	122	200	10	29	176	9
New low energy and passive - windows	30.000	6.000	4	6	26	200	33	7	28	1
New low energy and passive - other, buildings systems	30.000	15.000	6	30	71	200	7	32	189	9
Financial incentives for energy-efficient heating systems (measure G.2).										
2,300 modern gas boilers,		2.300	3	4	1	200	50	46	138	7
2,000 heat pumps and		2.000	3	4	1	200	50	40	120	6
5,000 modern wood biomass boilers		5.000	3	4	1	200	50	100	300	15
22,000 m_2 of solar collectors		22.000	4	6	6	200	33	110	440	22
MFH - optimisation of d.h. replacement of sub-stations		830	3	3	1	200	67	12	37	2
Scheme of energy efficiency for low-income households (measure G.3).										
MFH wall insulation	52.500	42.000	12	20	531	200	10	8	95	5
MFH replacement of windows	52.500	10.500	4	40	133	200	5	16	63	3

Estimation of number of trained workers per year (based on the assumptions in "Second NAEEP 2011-2016")	Renovation / construction planned per year (Au m2) from "Second NAEEP 2011-2016"	Amount of units of specific works planned per year (m2 wall insulation, boilers...)	Workers per team	Duration of works per unit (wall, system)	Amount of works per unit (wall, system)	Effective days per year	Units done per year by 1 team	Teams needed per year	**Workers needed on-site per year (by 2016)**	**Trainers needed Per year (by 2016)**
MFH loft and other elements	52.500	5.250	8	10	66	200	20	4	32	2
Replacement of 670 boilers with modern gas boilers		166	3	4	1	200	50	3	10	0
Replacement of 670 boilers with heat pumps		144	3	4	1	200	50	3	9	0
Replacement of 670 boilers with modern wood burning boilers		360	3	4	1	200	50	7	22	1
Installation of 8,950 m2 of solar panels		1.492	4	6	6	200	33	7	30	1
Financial incentives to raise energy efficiency in industry and the service sector and significantly increase the scope of environmentally friendly power generation from RES and CHP (measure I.2)										
service sector - wall insulation	80.000	64.000	12	20	531	200	10	12	145	7
service sector - replacement of windows	80.000	16.000	4	40	133	200	5	24	96	5
service - loft and other elements	80.000	16.000	8	10	133	200	20	6	48	2
service sector - 230 new modern gas boilers,		230	3	4	1	200	50	5	14	1
service sector - 650 modern wood biomass boilers and		650	3	4	1	200	50	13	39	2
service sector - 130 heat pumps		130	3	4	1	200	50	3	8	0
service sector - installation of 1.400 m_2 of solar collectors		1.400	4	6	6	200	33	7	28	1
New low energy and passive buildings wall insulation	206.000	206.000	6	20	664	200	10	31	186	9
New low energy and passive - windows	206.000	41.200	4	6	133	200	33	9	37	2
New low energy and passive buildings loft and other	206.000	61.800	6	30	199	200	7	47	279	14
**comment: buildings form industrial sector are not included*										
Financial incentives for energy-efficient renovation and sustainable construction of buildings in the public sector (measure J.2)										
public buildings - wall insulation	220.000	176.000	12	20	531	200	10	33	398	20
public buildings - replacement of windows	220.000	44.000	4	40	133	200	5	66	265	13

Estimation of number of trained workers per year (based on the assumptions in "Second NAEEP 2011-2016")	Renovation / construction planned per year (Au m2) from "Second NAEEP 2011-2016"	Amount of units of specific works planned per year (m2 wall insulation, boilers...)	Workers per team	Duration of works per unit (wall, system)	Amount of works per unit (wall, system)	Effective days per year	Units done per year by 1 team	Teams needed per year	**Workers needed on-site per year (by 2016)**	**Trainers needed Per year (by 2016)**
public buildings - loft and other elements	220.000	44.000	8	10	133	200	20	17	133	7
New low energy and passive buildings wall insulation	6.300	6.300	6	20	664	200	10	1	6	0
New low energy and passive - windows	6.300	1.260	4	6	133	200	33	0	1	0
New low energy and passive buildings loft and other	6.300	1.890	6	30	199	200	7	1	9	0
service sector - 230 new modern gas boilers,		230	3	4	1	200	50	5	14	1
service sector - 650 modern wood biomass boilers and		650	3	4	1	200	50	13	39	2
service sector - 130 heat pumps		130	3	4	1	200	50	3	8	0
service sector - installation of 1.400 m^2 of solar collectors		1.400	4	6	6	200	33	7	28	1
Support scheme for electricity generated from RES and CHP (measure V.3)										
solar power plants: 185/6=31 MW_e on buildings	50	620	10	20	1	200	10	62	620	31
CHP: 37/6=6 MW_e; (industry: 20/6=3,3 MWe)	1,1	3	6	20	1	200	10	0	2	0
CHP: 37/6=6 MW_e; (services and households: 17/6=2,8 MWe)	0,8	3,5	5	20	1	200	10	0	2	0
On-site workers needed per year (based on "Second NAEEP 2011-2016")	**Construction workers / Trainers**								**4175**	**209**
	System installers / Trainers								**757**	**38**
	PV installers / Trainers								**526**	**26**

Table 43: Qualification and training needs based on NEEAP

On-site workers needed per year (based on "Second NAEEP 2011-2016")	Skills needed / Trainers	Workers needed on-site per year (by 2016)	Trainers needed Per year (by 2016)
	Construction workers / Trainers	4175	209
	System installers / Trainers	757	38
	PV installers / Trainers	526	26

The result of the detailed analysis enabled the following conclusions, about

- the assumption of the annual training needs for implementation of the advanced measures related to nZEB and low energy renovation measures in public sector and in residential sector;
- the overview of the main qualifications of the workers that need training
- preliminary estimation of the number of trainers.

Further analysis will be done for the needs of the Roadmap.

7.3 Qualification needs

Lifelong learning for on-site workers in Slovenia involved in very low energy buildings and energy renovation as well as installation of nZEB technologies consists of three pillars:

- Formal VET education
- Informal VET education (National Vocational Qualifications (www.npk.si) and other informal certificates)
- Additional learning

Table 44: Annual trainings for on-site workers for nZEB – preliminary plan

year	2012	2013	2014	2015	2016	2017	2018	2019	2020	
annual training needs of existing workers	1950	1950	1950	2060	2180	2300	2420	2540	2660	
annual training needs of new foreign workers (new comers from ex YU, BiH)	1500	1500	1500	1500	1500	1500	1500	1500	1500	
need training - new workers coming from other sectors (new comers in the sector)	360	360	360	360	360	360	360	360	360	
annual training needs from young workers with IVET - need additional training	1000	1000	1000	1000	1050	1100	1150	1200	1250	
annual training needs	**4810**	**4810**	**4810**	**4920**	**5090**	**5260**	**5430**	**5600**	**5770**	**46500**
trained in on-going trainings CVET	2000	2200	2800	3200	3600	3100	1980	1600	1200	
trained in improved curricula of IVET					500	800	1150	1200	1250	
trained in accredited CVET nZEB trainings				400	990	1360	2300	2800	3320	
trained annually	**2000**	**2200**	**2800**	**3600**	**5090**	**5260**	**5430**	**5600**	**5770**	
gap - incomplete or inadequate trainings	2810	2610	2010	1320	0	0	0	0	0	

Preliminary idea of this project was to support formal VET education with better organized informal forms of learning, supported by industry and public sector and with monitoring and control of a branch organisation or cluster. As the year 2020 is very close a response to build up skills must be fast. More effort put on informal vocational education and training can facilitate the preparation of occupational standards and NPKs.

The Table 44 presents the evolution of training needs by 2020 with respect to the structure of the labour force as well as the education and training schemes that cover the needs. The Figures present the deployment of the labour force with clear indication of the gradual improvement of VET knowledge and skills.

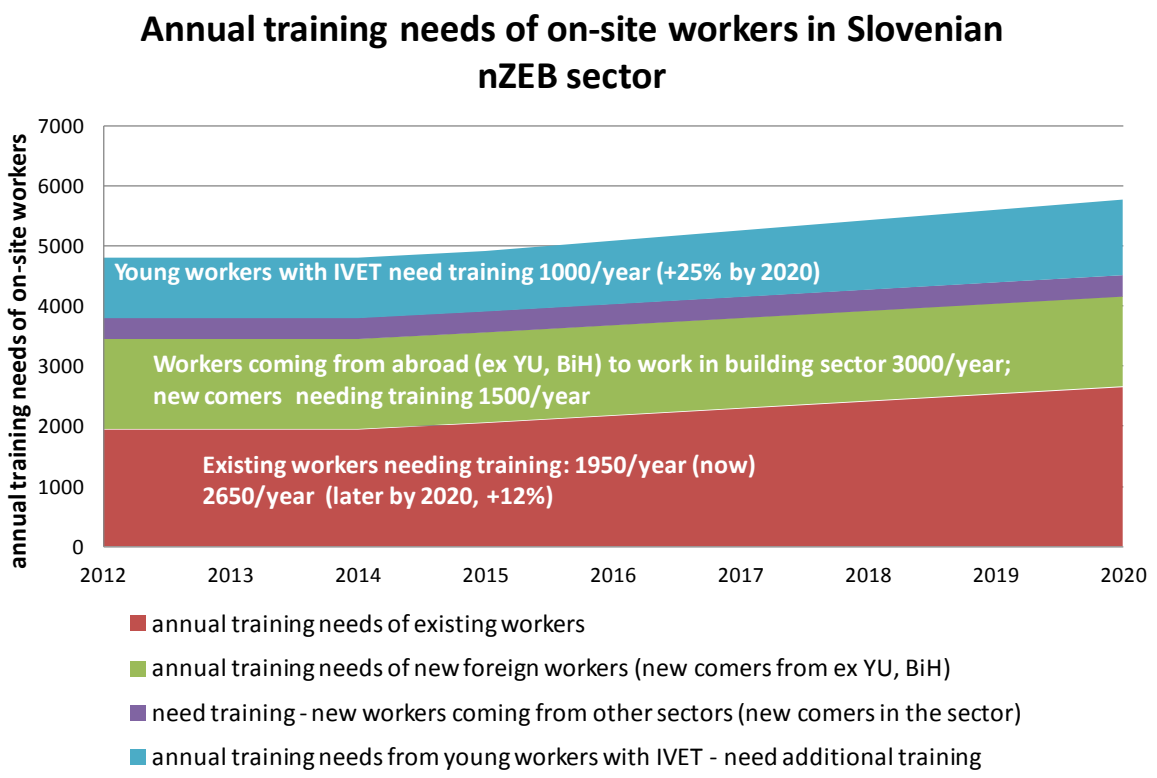

Figure 17: Annual training needs of on-site workers in Slovenian nZEB sector.

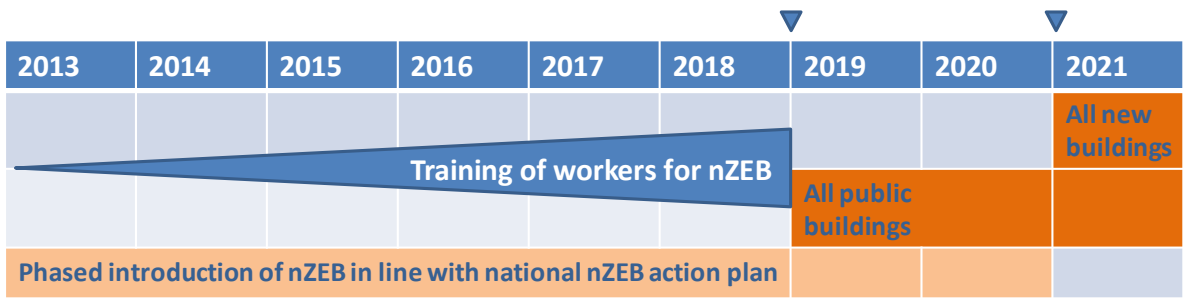

Figure 18:Evolution of training of workers for nZEB is focused on timing of EPBD Recast and the implementation of nearly zero energy buildings.

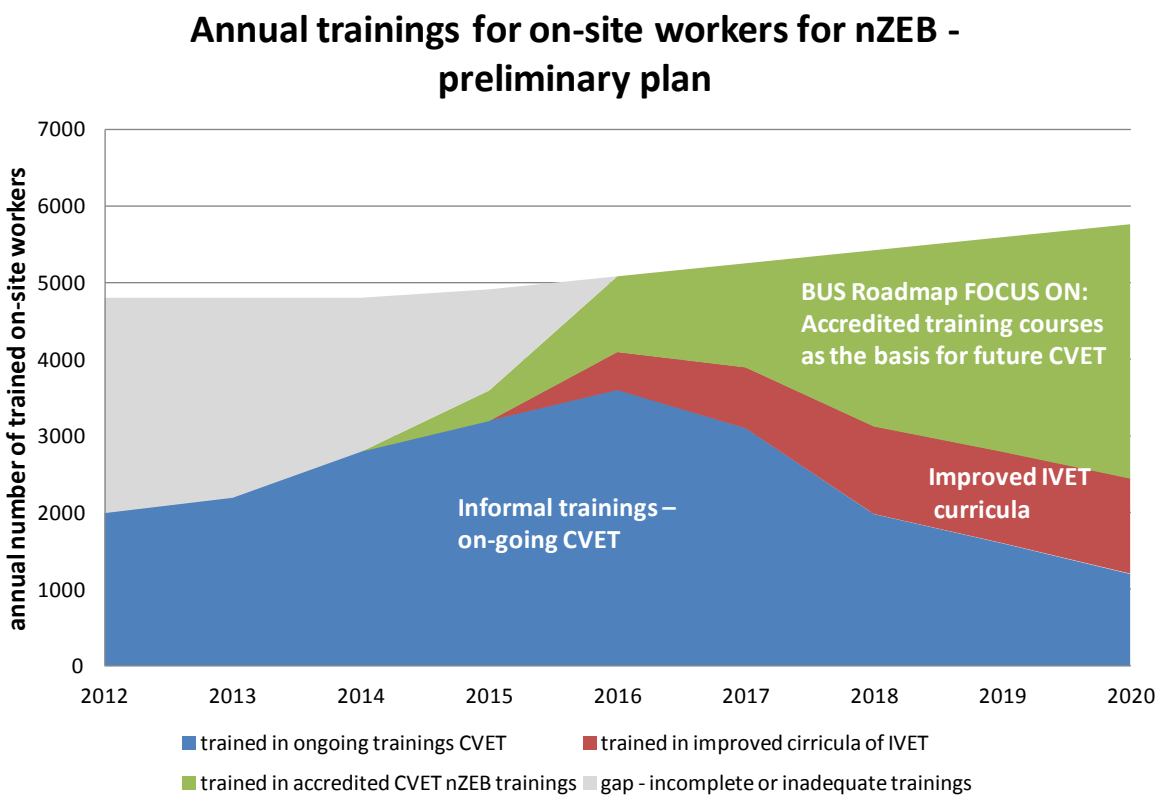

Figure 19: Annual trainings for on-site workers for nZEB preliminary plan

Key education/training elements for the future:

- construction of nZEB requires interdisciplinary approach with skilled workers being equipped with at least basic knowledge from other fields;
- focus shall be put on communication skills, knowledge of languages and information technologies;
- new practical training forms will be needed: on-site, working on concrete examples, short-term but repeated and continual, free of charge for own workforce;
- a complementary set up of informal training formats based on good training practice as supporting tools for other/existing education and training practices is highly appreciated by the relevant stakeholders;
- a certification system shall be established to evaluate informal training as a key segment of life-long learning;
- internal branch certificates are a recommended instrument for achieving better transparency of competences' proving procedures of nZEB workers;
- an integral quality assurance system for nZEB construction shall be set up, where based on commissioning the elements of quality will be defined for individual professions;
- a clear and elaborated overview of required competences is needed;
- construction industry shall be actively involved in the training process by executing acknowledged training programmes;

In order to assure that the skills of the on-site workers, working on energy efficient buildings and installing technologies for better energy efficiency and use of renewables, correspond to the needs of the construction sector, the monitoring of the up-skilling process of the workforce has to be established and the progress in VET sector compared against the needs and gaps of building sector. In case of inconsistencies between the gaps and provision of better skills of the on-site workers corrective measures must bet taken. Monitoring can be done by governmental institutions, professional organisations, professional chambers or associations, depending on the VET scheme and target group.

8 Barriers

Barriers are grouped as follows:

- barriers related to policies and regulation
- barriers related to economic situation
- barriers related to construction sector and construction processes
- enterprise level barriers
- personal barriers.

8.1 Barriers related to policies and regulation

These barriers directly or indirectly refer to the implementation of state-level and local policies, related to the achievement of the objectives 20-20-20 and green public procurement.

Regulated measures and requirements such as certification of installers and other actors in the construction activities are the most effective way and the strongest incentive to development of green jobs and delivering sustainable services. Due to different reasons, like assuring free and open market, enabling entrepreneurship, fears related to creation of potential monopoles in some services, overregulation of the building sector... , these measures are very carefully and definitely too slowly being put into practice.

Probably even more serious impact on implementation of sustainable building solutions and quality based installing services is a private and public procurement scheme of design and construction services. The latter is based on the parliament act which also allows and therefore stimulates the acceptance of the lowest bid as a prevailing economic concept. Consequently, in majority of public calls (more than 90%) there is no specific incentive for quality offers of design and construction services providing sustainable solutions, like taking into consideration long term concepts such as LCA analysis, life cycle cost, encompassing quality equipment, products and services, including installation, testing and commissioning. The delivery of construction services is planned solely at the lowest cost principle, where the quality of installing works can be reduced, if needed, much easier as the cost of the delivery of HVAC equipment and materials.

8.2 Barriers related to economic situation

Due to financial and economic crisis, the added value decreased in the industry by abandoning the proper:

- investments and project management (designing phase included) and consequently
- quality level of the work executed.

In the last 20 years, the State was far the biggest investor in an area of big constructions. State investments were oriented more to quantity then to quality (due to public procurement scheme of design and construction services which supported the concept of the lowest bid as a prevailing economic concept, as already described above). That became a rule in area of private investors as well. The message behind this bad practice, probably sent out unknowingly, had and still has a very strong influence on an attitude of the whole construction branch (from designers to construction companies). The State as investor didn`t take care about economics or return on investment as

needed. For example, despite subsidizing an energy saving renovation of buildings like comprehensive retrofitting, partial renovations such as renovation of windows only were allowed. The highest return of investment (the highest energy saving per investment) on short term was targeted. It is high time that now, when the State is even shorter of money only investments of qualitative and comprehensive (including energy saving) retrofitting of public buildings should be planned and executed. The planning process should stress the assessment of the sustainability of the retrofitting, taking into account environmental (NZEB), but also economic and social indicators. Within the construction and installation process, the policies should foresee (require) competent contractors and suppliers. This will - in longer term - add value to all stakeholders. It will also be good for the construction business in general because the quality and sustainability in longer term will overcome quantity and short term impacts.

Additionally, the overall picture of the construction sector (crisis, companies going bankrupt, people losing jobs on daily basis, disputable privatisation of big companies, partly owned by State and partly by small shareholders, illegal activities within the procurement processes ...) as presented by media, describes a building sector as not a promising one. Because of that, a low interest for enrolment in technical schools has been identified.

8.3 Barriers related to construction sector and construction processes

8.3.1 Barriers related to construction processes

The supply chain of the design, production, construction works, supply, installation, operation and maintenance of building facilities is very fragmented. Cooperation between actors in the supply chain usually bases on previous cooperation (past projects). But still, there is a lack of coordination among crafts and professions and a lot of work precariousness. The quality of execution of works in this system has lower importance than needed. There is also a lot of mistrust between the actors and the pressures to cut the prices as much as possible are a constant in the business. Contractor can win tenders with low prices besides the lack of specialized and skilled workers.

8.3.2 Barriers related to construction sector

The most important barrier is the lack of specialization of the construction workers on the building site (some of them are even non-qualified workers). We believe that the reason is economic and that it originates in the lack of added value in the building industry by abandoning the proper quality level of the work executed.

There is more than one reason to explain the situation:

- the break of ex-Yugoslav market and the loss of third world countries market
- public procurement scheme in Slovenia is almost solely based on the acceptance of the lowest bid
- enough construction work to be found in Slovenia

The break of ex-Yugoslav market and the loss of third world countries market

After the break of ex-Yugoslav market not only the loss of a large domestic market happened but also the loss of international markets (third world countries). Overcapacity of the branch appeared overnight. Companies needed to adopt immediately. Consequences were the following:

- building sector reduced the number of employees
- big construction companies and clusters with a comprehensive and specialised knowledge downsized by annual sales and disintegrated into smaller companies with a partial knowledge and questionable capital and economic potential

- non-standardised and less experienced investors appeared with a lack of comprehensive concept of planning and design
- a low threshold for contracting companies entering to market and for applying for tenders was enforced by investors. This caused reduction of the quality of planning processes, a lack of comprehensive concept in execution, and a lack of coordination in execution phase.
- traditional quality rules broke apart within particular guilds
- abandonment of the tradition of regular education in typical occupations (theory and practice not balanced)
- the lack of domestic construction workers happened even before
- random and campaign further education and training of construction workers
- grey economy increased rapidly
- massive occurrence of construction companies which are pronounced to be providers of passive and low energy housing – with questionable references.

Public procurement scheme in Slovenia

Public procurement scheme the Slovene practice is almost solely based on the acceptance of the lowest bid. In general, in the last 20 years the main criteria for acquisition of business in building sector was the lowest price of initial investment costs instead of the lowest price in the economic period of the investment. A quantity was forced before a reasonable quality level without a rational judgment based on economic factors. Investors mostly did not really care what will happen with their buildings at the time of use in a long term period. The State as the biggest investor had very important role in enforcement of that process and a type of behaviour. Such an attitude resulted in the non-competitive construction branch which in general became not profitable enough to enable necessary appropriate development, specialization and training of workers.

Enough construction work to be found in Slovenia

On the other hand construction and installation companies provided their services mostly in Slovenia which is a very small market. Therefore they could not specialize enough because they had to combine different types of services and business to survive. It means that they were not able to reach the right level of economy of scale.

8.4 Enterprise level barriers

Two major barriers can be identified:

- a lack of capital and executive capacities – daily and short term run
- a need for working in the informal economy to achieve liquidity of a company cash flow.

On the short term, the current crisis in the construction sector forces many oversized and not restructured companies to downsize. Many of them had to declare bankruptcy, too. Because of that, the employment in the sector is considered a very risky one. Many skilled workers are looking for other jobs, mainly in procurement of equipment, in other sectors or even abroad. Nevertheless, some companies have already reported that they were not been able to find proper (skilled) workers for works they have won on tenders, and had to train the ones applied for these jobs.

A fear of the employers and managers that better trained workers will also demand higher wages can also be seen as a problem especially for micro and small enterprises, representing the majority of the construction sector.

On the medium and long term the crisis accelerated the needed changes. Enterprise level barriers relate primarily to the ability of firms to adapt to new challenges, including:

- Continuous and rapid development of technologies represents additional pressure on the construction sector. These changes and the simultaneous development of technology driven demographic change, climate change, globalization, and a clear awareness of the scarcity of natural resources, such as water and oil. This should be seen as an opportunity to transform the sector into a knowledge-based industry.
- An aging population: Due to decreasing birth rate and an aging population, lack of competent workforce is increasingly apparent. Creating interesting jobs and improve productivity will be the key challenges of the sector in the near future. Especially if we take into consideration a negative image of the sector as can be seen in media.

To overcome these two barriers, companies should invest in R&D and especially in transfer of new technologies which has to be accompanied by appropriate training. With that the interest for employment in the sector will rise which is a prerequisite for the effective training.

Ability to adapt quickly and development is imperative for the survival and competitiveness of enterprises. Using new approaches, technologies, processes, services a competitive advantage, which is limited in time, since they have products, processes and services its life cycle.

So the question is whether managers and business owners in the conditions of economic crisis, when engaged in their livelihood and financial problems, aware of all of the above.

All that means that the Buildup Skills Road Map should take into consideration (e.g. make aware, train in specific skills related to HRM) the employers and managers as the key decision makers for ordering, approving and providing resources for the formal and informal training and education of installers and other profiles related to NZEB.

8.5 Personal barriers

Personal barriers to enrolment in the program may be very different: some are afraid to show their actual "knowledge" they poses within the training activities, while others consider existing educational programs too formalized, to theoretical. For non-formal trainings they think there is too much marketing and promotion of particular brands, and the approach is not as professional as expected. The timing of training can be also considered a problem especially for the ones which work in field, on different locations. Key personal obstacles can be grouped as follows:

- situational barriers,
- institutional barriers,
- dispositional barriers.

8.5.1 Situational barriers

Money

Costs for literature, tuition, transport to education, payment for child care etc. Money is more often problem for women than for man, and especially for young, unemployed people. Short informal trainings can be free but there is too much promotion of particular brands or systems than real content based training. Well organized learning beyond especially vocational education to ensure better career opportunities tend to be too expensive for target population. Without financial incentives from public sector (government, ministries, and agencies) or from companies (employers) there is not enough interest for the enrolment.

Time

this barrier is embedded in education, career building and family organisation. It is more important within the group of employees which are well educated, have complex and demanding jobs and higher incomes. As a general rule we can say that active people have larger needs for new knowledge and are willing to spend more time for it.

In the construction industry, this barrier is a problem for workers with lower levels of education. In case of increased volume of work in the construction season (an obligation that is imposed on the employee by the employer) there is no time for any kind of training and education. But a paradox occurs in times of crisis: even there is lack of attendees to attend training because they lost their jobs and employers have to take different downsizing measures, also in regard the investments in training and education. The R&D and training & education are the first fields of saving company resources. Of course these workers might be trained as unemployed persons if such programmes would exist. For those firms that still operate, as already said, the money is an obstacle for training and education, e.g. for gaining skills and competence required by 20-20-20 objectives. The implementation measures require trained professionals of various disciplines. In this case, the state policies in the field of training of the unemployed workers should under certain conditions enable (support, subsidise) proper and active education and training of these workers.

The idea that arises is that trainings might be on done on smaller projects , for example on small retrofitting projects of public buildings, in a form of joint partnership between the contractor, unemployed workers, agency for unemployment, investor, and consultant. With this kind of work and training engagement of unemployed workers, the benefits would occur for all parties involved. The contractor would benefit from partly subsidised workers and will be able to employ worker if he/she shows good skills and competences. The workers showing appropriate self-motivation for this kind of training - will acquire practical skills and the training would be more field that desk oriented which is important from social point of view. The agency for unemployment would have better chances to implement an effective training and consequently also employment of unemployed person. The (public) investor will benefit from some reduction of costs and assurance of the quality of retrofitting. The consulting and training organisation responsible for training will have better condition for training and also assessment of skills attained. And, if engaged for technical supervision of the works, they will be able to check the overall technical solution implemented on this building. These trainings should implement the learning by doing and understanding concept.

Time can be an obstacle in the case of a personal's desire to increase volume of working hours and to increase income consequently. This is especially the case of workers from abroad. This obstacle can be eliminated by adjusting the training schedule (which is one of the institutional barriers).

Distance to training location

This situational barrier is mostly cited by adults as reasons they education cannot attend the training. Perhaps also because it is the most convenient excuse if they don`t have the motivation for training. Greater distance than 20 km is not normally accepted well.

8.5.2 Institutional barriers

Schedule

The potential participants can adapt hardly (working hours, family, etc..) to the opportunities offered if they are not flexible enough.

Inadequate programs

Adults look for utility of new acquired knowledge and have specific learning needs - fairly clear goal. They are willing to invest a lot of effort to achieve those. There is a challenge for educational institutions to determine whether they are qualified to do their job well enough.

As a special chapter to mention is the lack of foreign language skills, especially among the older generation and the slightly lower educated personnel. Slovenia is a small country with a relatively small population and it does not have sufficient technical literature in the native language, what is certainly reflected in the form of resistance to self-education.

It is recorded that Institutional barriers feel about 10-25% of adults.

8.5.3 Dispositional barriers

Those barriers are related to the psychological characteristics of individuals, such as image about oneself, self-esteem, level of aspiration, attitudes, ability to learn, attitude to education. They are often underestimated, because they are derived from an individual and show the negative conception of learning as the learning effort that is necessary to overcome the same way as master fear of failure. A poor self-esteem is associated with a sense of their own insecurities, experience failure. These barriers may manifest as:

- Lack of energy
- No desire for education,
- Learning a resistance rather than enjoyment

The causes of these barriers include the following:

Gender

Women are more interested in General education content than man, on average. And women have more diverse and complex interests for education than men. At the same time, the motives in different life stages differ materially.

Age

Young people have greater need for technical and vocational enforcement, so their motives for education focused more on this area. On the other hand, adults have a lot of life experiences to assist them in acquiring new knowledge and linking new information to existing knowledge. Due to decreasing birth rate and an aging population, lack of competent workforce is increasingly apparent. Creation of attractive jobs and improve productivity will be the key challenges the construction sector in the near future.

Preliminary Education

Individuals with higher levels of education are on average more likely to opt for education. The unemployed are often dealing with problems associated with their job search due to financial and other psychosocial problems. Training program in the workplace conducted by the Employment Service of Slovenia is an opportunity for businesses in the construction industry as a project BUILD UP Skills is one of the options to remove these barriers.

Reflects of the situation in today's society

At staff (employed and unemployed, young and old) the economic crisis and the state of society are strongly reflected. Overall, a large drop of consciousness for quality implementation was noted. The

aim of work is only a "work completed", but not "high-quality work completed." Part of the problem is probably due to the crisis of life values in society when people are overwhelmed with the daily news of bankruptcies, economic crime, unclear privatization and when the money is the only criterion for evaluation. In today's society, scientific and technical knowledge (and related occupations and works) is not sufficiently respected, what is partly due to inadequate economic and educational policy in the past decade. It would be necessary to start raising awareness that the technical knowledge and skills are primary holders for progress and development of a society.

8.5.4 Summary:

Adults most often cited situational barriers as reasons that education cannot be attended. Institutional barriers are felt by about 10-25% of adults. Psychological barriers are mentioned by only 5-15% of surveyed adults. Negative attitude to training have mainly adults with lower socio-economic status. Fear of a failure is much more common in the elderly compared with younger persons. This is particularly important to consider in relation to the planned training within the project BUILD UP Skills Slovenia.

9 Conclusions

The primary objective of the Build Up Skills Slovenia project is to define the national framework for upgrading the existing skills and for development of new qualification schemes for new, appropriately skilled workers to achieve Targets 2020.

This objective will be accomplished by:

- Establishment of the national qualification platform as a convincing and inclusive process for consultation of and participation by the relevant recognised stakeholders in both the building and the education/training.
- Analysis of the status quo to frame and quantification of the needs for qualified workers in the building sector in Slovenia by 2020, based on the retrofitting and new nZEB market trends and regulatory requirements. The review of the national system for initial and continuing education/training will enable identification of gaps and barriers between the current situation and the needs for 2020.
- Roadmap will explain how to overcome barriers and identified skills gaps in various professions by appropriate measures (embed training on intelligent energy solutions for buildings in the mainstream curricula and practice of building professionals), organization of the roadmap implementation and its monitoring.
- The roadmap endorsement is a multi-stage process with the aim to assure endorsement by relevant public and private authorities, institutions and stakeholders in construction sector and education/training field – including their further involvement.
- Intensive dissemination, including final national conference will support the endorsed road map and further implementation of actions.

Within the preparation of this Status Quo report a comprehensive analysis of the building sector needs with respect to EE and RES technologies has been made, alongside with an analysis of the national system of continuing education, informal trainings, gaps and needs for training, trainers and quantified data for the need of skilled workers.

It can be assumed that the Slovenian construction sector faces similar obstacles and challenges with regard to comprehensively skilled energy efficiency-related practice as in many other EU countries.

The analysis has shown that existing needs, irrespective of the current construction activities' intensity and volume, to a noticeable extent surpass the level of service the workers are capable of providing. As expected this is connected to their skills and competences related mainly to the education/training schemes available. Development of construction materials and technologies, and increased energy efficiency regulatory demands impose equivalent development of construction practice, with nZEB being no exception. As a consequence of firm strategies towards EE in buildings the number of qualified workers in the building sector shall be increased through learning and gaining qualifications.

Such an evolving and strategically important sector must be supported by an adequate training/education scheme for workers. Moreover, the fact is that skills and competences obtained at a certain stage will probably become obsolete or at least deficient after a certain time period, so we are talking about a lifelong learning process (or, continuous upgrade of skills).

Vocation education and training programmes in Slovenia are based on professional occupation standards. Social partners define knowledge, skills and competitions for each professional occupation standard. These standards are composed in a system of National Qualification Framework. The preparation of this framework is coordinated by the Institute of the Republic of Slovenia for Vocational Education and Training (CPI). The framework of Building sector professional occupation standards is

based on various professional fields (building and construction wood technology, machine installer, energetic and electrical equipment …).The vocational educational reform (ended in 2011) has adapted old and made new educational programmes oriented to the needs of labour market.

However, significant empty or at least grey areas related to the energy efficiency field remain both in initial and continuing education/training, and need to be covered in order to bridge the gap between current situation and immediate and future needs and targets. The identified problem will have to be tackled carefully and systematically, as it is not only related to the training system itself, but also to the overall economic situation, to perception and business strategy of the employers (construction companies), and to the motivation and aims of the workers themselves.

Improving workers' skills must be one of the horizontal national targeted activities, as energy efficient buildings are one of the key priorities of the Slovenian climate and energy policy. There is a need for renovation to increase energy efficiency and then switch to RES, while in new construction the fast adoption of NZEB is a part of national strategy. None of these goals can be achieved without setting of an educational/training system providing comprehensive skills to workers and so facilitating implementation of energy efficient construction practice.

It is true that workers are only one link in the construction chain, and that in order to achieve excellent results all involved parties must provide own quality share. With energy efficient buildings this is accurate for example also for planners, supervisors, and many other, even investors. However, the workers are those most responsible for the successful transfer from theory into practice.

The Slovenian National action plan on employment is focused on reduction of long term unemployed persons and re-qualification according to the needs of employers. In this respect more effort shall be put on preparation of national professional qualifications and revision of programmes for regular vocational education and training. Slovenia is following EU target that 25% of unemployed persons are to be involved in re-qualification – this is an excellent opportunity to support and define new (green) qualifications in EE and RES in buildings.

Key findings and conclusions of the report can be summarised as follows:

Initial vocational education and training – formal education

- Energy efficiency (EE) in Slovenia is dispersed in many industrial fields as well as the knowledge and skills about energy efficiency are scattered in variety of traditional professions and crafts.
- The overview of existing vocations that are related to energy efficiency and integration of RES in buildings was done. The analysis of curricula of initial vocational education showed that energy efficiency related topics in professional modules of curricula do not exceed 15% of hours in case of mechanical technicians and are even lower (below 8%) in educational programmes of civil engineering.
- Around 20% of curriculum in VET programmes is so called open curriculum, which is developed according to the preferences of the particular school and the industry in the region. In practice the topics of open curricula are not sufficiently transparent and may depend rather on the preferences of the teacher than on the actual needs.
- Young population in Slovenia has very low interest for enrolment in secondary vocational education and training (VET) programmes (STE - secondary technical education VTE - vocational technical education SVE - secondary vocational education). Constant drop of enrolment was identified from 15.8% population in 2007/2008 to 11.7% in the year 2011/2012. This drop is particularly noticeable in occupations of construction sector (only 4 bricklayers and 6 carpenters started the initial education in 2011) while the enrolment in the programmes mechanical technician and fitter of mechanical installations dropped only moderately. The upgrade of curricula in initial VET is important but it cannot have a major impact on improvement of EE competences of blue collar workers that are on the labour market.

Informal education and training

- Informal education and training is the most important pillar of the lifelong learning in construction sector. The building industry, suppliers of the building products, specialized institutes, and school centres with inter-company training centres offer courses for improvement of skills, related to new technologies relevant for nearly zero energy buildings. The skills given in such training courses are traditionally the mode for up-skilling of adults.
- The skills and knowledge obtained in the informal education and training can be formally recognized through the system of national vocational qualifications (NPK) (if and when the related vocational standard and competences are provided). It is a common practice that certificates of command of languages are in practice recognized although the language courses are not part of formal education and certification. Like in this example the Build up skills Slovenia project focused on development of internal branch system of accreditation of informal training courses and certification of trainees passing the training and related exam.

National Vocational qualifications (NPK)

- Formal education is concluded with provision of the certificate that acts as a proof of qualification. A system of national vocational qualifications is (www.npk.si) was developed to enable the formal recognition of person's competencies got through lifelong learning (work experiences and informal education).
- In 2012 in the frame of NPK new vocational standards relevant for nZEB were in preparation: Level IV: Fitter of photovoltaic systems, Fitter of thermal systems, Fitter of solar systems; Level V: Energy manager of buildings
- The insight into NPK framework showed that NPK system takes a lot of time in order to implement all necessary steps for the implementation of the scheme; to meet the 2020 targets in time more effective and faster approach is needed, based on existing informal education and training.

Construction sector

- Significant reduction in construction sector was observed in the period 2008-2011, the crisis in construction sector continued in 2012,
- The number of building permits dropped significantly (-35%), from 4200 to 2800 in residential sector and from 1200 to 1000 in non-residential sector.
- Currently, construction sector is subject to transformation, there are practically no big construction companies left (after the series of bankruptcy cases from 2008 on), foreign construction companies are entering Slovenian market, while consequently the share of domestic labour and domestic subcontractors and technology providers is further reduced. Small companies are growing but they are oriented to the works abroad.

Employment in construction sector:

- The number of employees in construction sector dropped consequently by 21% (i.e. 70.000 persons is employed in 2011 in Slovenian construction sector, that accounts 8.4% of total employment in Slovenia).
- An average unemployed person in construction sector has 45 years, and education below the average level in Slovenia.
- In 2011 the growth of demand for workers in construction sector was identified (from 12.000 vacancies in 2010 to 21.000 vacancies in 2011), potential employers are small companies, the works are mostly abroad, 80% of jobs are only for fixed term for less than 6 months.

- Precarious workers are typical for Slovenian construction sector; in 2011 99% of foreign workers come from former Yugoslav republics (54% from Bosnia and Herzegovina). Language barrier is a problem if workers from other countries than former Yugoslav republics are employed.
- Understanding the employment structure helps us in identification of the adult workers training needs and appropriate training forms.

New nZEB and energy renovation, and RES

- The second NEEAP 2011-2016 provided the necessary measures in building sector to meet the targets of climate and energy package, this was based for the estimation of the necessary number of trained persons. The estimation was cross checked with the numbers of labour force in construction sector.
- In line with the RES Directive the Ministry prepared the legal basis for the training and certification of experts, regulation for training programme is in development.
- Detailed investigation of the building sector, based on the real estate registry, enabled the assessment of the energy renovation potential. In case of additional financial instruments (EIB...) the number of energy renovation measures will increase, therefore this fact was considered in the training needs assessment.

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CCS - Construction Cluster of Slovenia

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OZS – Chamber for crafts and small business

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IZS - Chamber of engineers

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SCNM – School centre Novo mesto

Damjana Gruden – secondary technical and vocational education curricula

Goran Maker – open curricula in mechanical engineering

Ado Barbiš – curricula in mechanical engineering (Šolski center Postojna)

CPI - Institute of the Republic of Slovenia for Vocational Education and Training

Igor Leban – VET system and programs

Barbara Kunčič – national qualification system

Mag. Darja Štarkl – analysis of labour market

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12 Glossary

EE – energy efficiency

RES – renewable energy sources

NEEAP – National energy efficiency action plan for Slovenia

NREAP - National renewable energy action plan for Slovenia

STE - secondary technical education

VTE - vocational technical education

SVE - secondary vocational education

LVE - lower vocational education

SORS . Statistical office of Republic of Slovenia (Zavod RS za statistiko – SURS)

VET . Vocational education and training

SCO . Standard Classification of Occupations

SCA - Standard Classifcation of Activities

REN – National real Estate Registry

NEP – National Energy Programme

ESS - Employment Service of Slovenia (Zavod RS za zaposlovanje — ZRSZ),

CPI - Institute of the Republic of Slovenia for Vocational Education and Training (Center RS za poklicno izobraževanje)

SORS – Statistical Office of Republic of Slovenia (Zavod RS za statistiko – SURS)

SMARS - The Surveying and Mapping Authority of the Republic of Slovenia (Geodetska uprava Republike Sovenije - GURS)

IJS – Instutute Jozef Stefan

SDGD - Union of Construction workers of Slovenia (Sindikat delavcev v gradbeni dejavnosti)

13 Annex

13.1 Number of hours in curriculum regarding energy efficient buildings and the use of RES in the professional part of curricula.

MECHANICAL ENGINEERING

Mechanical technician (STE)

		RES and RUE	professional hours in curriculum All
Technical communication	o	0	140
Planning of structures	o	0	140
Management and organisation	o	0	70
Efficient use of energy	o	10	140
Material characteristics, primary formation and transformation	o	8	70
Operation of control and electrical components	o	0	140
Treatment of materials	o	0	140
Bonding materials and heat treatment	o	0	105
3-D modelling and preparation of documentation	i	0	158
Computer added technologies	i	0	158
Tools and devices for massive production	i	0	158
Planning of production processes in mechanical engineering	i	0	158
Automation and robotics	i	0	158
Energy systems	i	50	158
Planning of building installations	i	130	158
Production and distribution of energy in mechanical engineering	i	90	158
o-obligatory subject; i-optional subject		**288**	**2209**

Mechanical technician (VTE)

		RES and RUE	All
Planning of structures	o	0	136
Management and organisation	o	0	66
Efficient use of energy	o	10	136
Treatment of materials	o	0	136
3-D modelling and preparation of documentation	i	0	140
Computer added technologies	i	0	140
Tools and devices for massive production	i	0	140
Planning of production processes in mechanical engineering	i	0	140
Automation and robotics	i	0	140

Energy systems	i	40	140
Planning of building installations	i	120	140
Production and distribution of energy in mechanical engineering	i	80	140
		250	**1594**

Fitter of mechanical installations (SVE)

		RES and RUE	all hours
Tehnical communication in the occupation	o	0	99
Materials and treatment in occupation	o	0	66
Elements of structures	o	0	66
Organisation and managemnt	o	0	66
Mechanical installations	o	5	196
Basics of energy processes	o	20	132
Welding, soldering and bonding	o	20	147
Heating and cooling systems	i	20	146
Air conditioning and ventilation systems	i	15	146
Plumbing system and sewage	i	15	146
Gas installation	i	15	146
		110	**1356**

Roof plumber (SVE)

		RES and RUE	all hours
Tehnical communication in the occupation	o	1	99
Materials and treatment in occupation	o	1	66
Elements of structures	o	0	66
Organisation and managemnt	o	0	66
Transport, fitting and protection of elements and structures	o	5	131
Plumbing works	o	4	245
Roofing works	o	4	245
Special procedures of bonding	i	0	140
Welding	i	0	140
		15	**1198**

Joiner of metal structures (SVE)

		RES and RUE	all hours
Tehnical communication in the occupation	o	0	99
Materials and treatment in occupation	o	0	66
Elements of structures	o	0	66
Organisation and managemnt	o	0	66
Preparation of parts for bonding	o	0	159
Transport, fitting and protection of elements and structures	o	5	131
Welding, soldering and bonding	o	0	163
Manual metal arc (MMA) welding	i	0	154
Gas arc welding	i	8	154
Special procedures of bonding	i	0	154
		13	**1212**

Assisstant in technological processes (LVE)

		RES and RUE	all hours
Technical communication	o	0	147
Handling with machinery and devices	o	0	363
Maintenance of machinery and devices	i	0	470
Operation of machinery and devices	i	0	470
Transformation of materials	i	0	470
Casting of materials	i	0	470
Production and maintenace of electrical installations	i	15	470
Mechatronic sets	i	0	470
Basic painter works	i	5	470
		20	**3800**

CIVIL ENGINEERING

Environmental protection technician (STE)

		RES and RUE	all hours
Environmental protection	o	20	170
Technical drawing and use of computer	o	0	136
Materials and environment	o	10	204
Environmental technologies	o	42	204
Management and organisation	o	5	102
Legislation on protection of the Environment	o	5	102

Waste management	i	22	204
Drinking water and technological water management	i	5	204
Waste water management	i	0	204
Spatial management and soil quality	i	0	204
Environmental protection in enconomy	i	0	204
Protection of the air and chimney sweaping	i	62	204
o-obligatory subject; i-optional subject		**171**	**2142**

Construction technician (SSI)

		RES and RUE	all hours
Architectural engineering	o	50	375
Civil Engineering facilities	o	0	250
Construction mechanics	o	0	320
Calculation	o	0	140
Geodesy in civil engineering	o	0	70
Basics of technical design	o	0	270
Planning of buildings	i	10	70
Planning of civil engineering facilities	i	0	70
Preparation and leading of construction works	i	0	70
Economics in civil engineering	i	0	70
		60	**1705**

Bricklayer (SVE)

		RES and RUE	all hours
Civil engineering	o	2	198
Basic construction technology	o	2	165
Technical drawing	o	0	99
Bricklayers works	o	0	455
Ground works	i	0	65
Insulation	i	13	65
Hand treatment of stones	i	0	65
Operation of light construction machinery	i	0	65
Wooden structures	i	0	65
Ceramic cladding	i	0	65
Operation of truck	i	0	65
Decking	i	0	65
Scafolders	i	0	65
		17	**1502**

Tiller - setter of ceramic claddings (SVE)

		RES and RUE	all hours
Civil engineering	o	2	198
Basic construction technology	o	2	165
Technical drawing	o	0	99
Stove making and ceramic cladding setting	o	0	455
Insulation	i	13	65
Hand treatment of stones	i	0	65
Building	i	0	65
Renders	i	0	65
Operation of truck	i	0	65
Painters works	i	0	65
		17	**1307**

Carpenter (SVE)

		RES and RUE	all hours
Civil engineering	o	2	198
Basic construction technology	o	2	165
Technical drawing	o	0	99
Carpenters works	o	0	455
Insulation	i	13	65
Operation of light construction machinery	i	0	65
Concrete and reinforced concrete works	i	0	65
Decking	i	0	65
Prefabricated scafolders	i	0	65
		17	**1242**

Erector of prefabricated buildings (SVE)

		RES and RUE	all hours
Civil engineering	o	2	198
Basic construction technology	o	2	165
Technical drawing	o	0	99
Prefabricated construction	o	0	455
Insulation	i	13	65
Building	i	0	65
Renders	i	0	65
Wooden structures	i	0	65
Prefabricated scafolders	i	0	65

Painters works	i	0	65
		17	**1307**

Chimney sweeper (LVE)

		RES and RUE	all hours
Civil engineering	o	2	198
Basic construction technology	o	2	165
Technical drawing	o	0	99
Chimney sweaping	o	5	455
Building	i	13	65
Insulation	i	0	65
Wooden structures	i	0	65
Prefabricated construction	i	0	65
Stoves	i	0	65
Prefabricated scafolders	i	0	65
		22	**1307**

ELECTRICAL ENGINEERING

Electrical technician (STE)

		RES and RUE	all hours
Informatics and technical communication	o	0	136
Use of ICT in bussines	o	0	136
Operation of programmable devices	o	0	170
Production of basic circuits	o	0	204
Planning and connection of electrical devices	o	0	204
Elaboration of electrical and communication installations	o	0	136
Planning of electrical installations	i	0	156
Drive technology	i	0	156
Use of regulation technology	i	0	156
Operation of electrical energy systems	i	0	156
Production and distribution of electricity	i	0	156
Mangament of distribution networks	i	0	156
Use of microprocessor devices	i	0	156
Transfer and recording of information	i	0	156
Maintenance of computer harware	i	0	156
Planning of automation manchinery	i	0	156

Equipment for multimedia	i	0	156
AV communications	i	0	156
Production and transformation of electricity	i	0	156
Data collection and processing of proces data	i	0	156
Web aplication in multimedia	i	0	156
Computer added design	i	0	156
o-obligatory subject; i-optional subject		**0**	**3482**

Electrician (SVE)

		RES and RUE	all hours
Informatics and technical communication		0	136
Production of basic circuits		0	136
Electric devices		0	156
Use of regulation technology		0	114
Production of electric and communication installation		0	136
Operation of electrical energy systems		0	156
Connection of electrical motors		0	136
Electronic sets		0	136
Data collection and processing of proces data		0	156
Installation of smart installation		0	103
Renewable energy sources		25	103
		25	**1468**

13.2 List of schools implementing secondary vocational education & training and higher vocational education in the field of energy efficient building

STE - secondary technical education

VTE - vocational technical education

SVE - secondary vocational education

LVE - lower vocational education

ŠOLA **SCHOOL**	**IZOBRAŽEVALNI PROGRAMI**			
	SREDNJE POKLICNO IZOBRAŽEVANJE SVE - secondary vocational education	**SREDNJE STROKOVNO IZOBRAŽEVANJE** SVE - secondary vocational education	**POKLICNO TEHNIŠKO IZOBRAŽEVANJE** VTE - vocational technical education	**VIŠJE STROKOVNO IZOBRAŽEVANJE** HBE – higher vocational education
GORENJSKA REGIJA				
1. Ekonomsko-storitveni izobraževalni center Kranj **Gradbeno-storitvena šola**	- erector of prefabricated buildings - tiler – stter of cheramic cladidng - graphic painter	- construction technician	- construction technician	
2. Srednja šola Jesenice		- mechanical technician	-	
3. Šolski center Škofja Loka **Srednja šola za strojništvo**	- fitter of mechanical installations	- mechanical technician		
4. Šolski center Škofja Loka **Srednja šola za wood engineering**	- joiner	- wood technician	- wood technician	
5. Šolski center Škofja Loka **Višja strokovna šola**	-	-	-	- wood engineering - strojništvo
6. Tehniški šolski center Kranj **Strokovna in poklicna šola**	- electrician	- electrical technician	- electrical technician	
7. EDC Kranj **Višja strokovna šola**	-	-	-	- civil engineering

GORIŠKA REGIJA				
8. Gimnazija Jurija Vege Idrija		- mechanical technician		
9. Tehniški šolski center Nova Gorica Elektrotehniška in računalniška šola	- electrician	- electrical technician	- electrical technician	
10. Tehniški šolski center Nova Gorica Strojna, prometna in lesarska šola	- fitter of mechanical installations - joiner	- mechanical technician	- wood technician - mechanical technician	
JUGOVZHODNA SLOVENIJA				
11. Srednja šola Črnomelj Srednja poklicna in strokovna šola		- mechanical technician		
12. Srednja šola Kočevje	- joiner			
13. Šolski center Novo mesto Srednja elektro šola in tehniška gimnazija	- electrician	- electrical technician	- electrical technician	
14. Šolski center Novo mesto Srednja gradbena in lesarska šola	- joiner - bricklayer - tiler – setter of ceramic cladding	- construction technician - wood technician	- wood technician	
15. Šolski center Novo mesto Srednja strojna šola	- fitter of mechanical installations - roofer	- mechanical technician	- mechanical technician	
16. Šolski center Novo mesto Višja strokovna šola	-	-	-	- wood engineering - mechanical engineering
KOROŠKA REGIJA				
17. Šolski center Ravne na Koroškem Srednja šola		- mechanical technician - electrical technician	- mechanical technician	
18. Šolski center Ravne na Koroškem Višja		-	-	- mechanical engineering

strokovna šola				
19. Šolski center Slovenj Gradec Srednja gostinsko turistična in lesarska šola	- joiner		- wood technician	
NOTRANJSKO-KRAŠKA REGIJA				
20. Srednja gozdarska in lesarska šola Postojna	- joiner			
21. Šolski center Postojna Srednja šola		- mechanical technician	- mechanical technician	
22. Šolski center Postojna Višja strokovna šola		-	-	- mechanical engineering
OBALNO-KRAŠKA REGIJA				
23. Pomorski in tehniški izobraževalni center Portorož Srednja šola in dijaški dom		- electrical technician		
24. Srednja tehniška šola Koper	- fitter of mechanical installations	- mechanical technician	- mechanical technician	
OSREDNJESLOVENSKA REGIJA				
25. Elektrotehniško – računalniška strokovna šola in gimnazija Ljubljana		- electrical technician		
26. Srednja gradbena, geodetska in ekonomska šola Ljubljana Srednja strokovna šola		- construction technician	- construction technician	

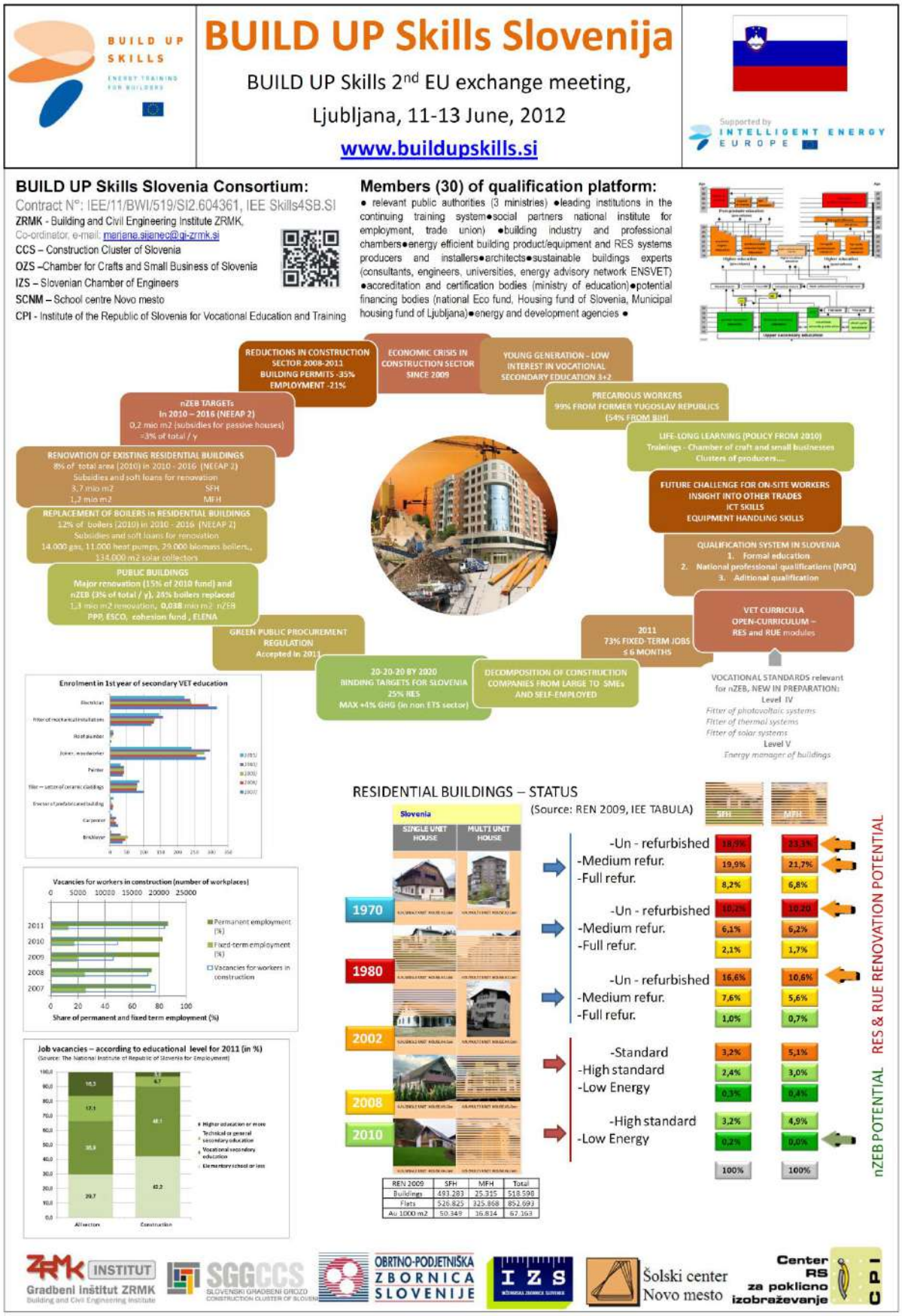
27. Srednja gradbena, geodetska in ekonomska šola Ljubljana Srednja poklicna šola	- carpenter - bricklayer - tiler – setter of ceramic cladding	-	-	
28. Srednja poklicna in strokovna šola Bežigrad – Ljubljana	- klepar - roofer		- mechanical technician	
29. Srednja šola Domžale Poklicna in strokovna šola	- fitter of mechanical installations		- mechanical technician	
30. Srednja šola tehniških strok Šiška	- electrician		- electrical technician	
31. Šolski center Ljubljana Srednja lesarska šola	- joiner	- wood technician	- wood technician	
32. Šolski center Ljubljana Srednja strojna in kemijska šola		- mechanical technician		
33. Izobraževalni center elektroenergetskega sistema Višja strokovna šola		-		- elektroenergetika
34. Center za poslovno usposabljanje Višja strokovna šola		-		- civil engineering
35. ZARIS Zavod za razvoj, izobraževanje in svetovanje Višja strokovna šola		-		- civil engineering
36. Izobraževalni zavod HERA Višja strokovna šola		-		- mechanical engineering
37. Izoibraževalni center GEOSS Višja strokovna šola		-		- mechanical engineering

PODRAVSKA REGIJA				
38. Lesarska šola Maribor Srednja poklicna in strokovna šola	- joiner	- wood technician	- wood technician	
39. Lesarska šola Maribor Višja strokovna šola	-	-	-	- wood engineering
40. Srednja elektro – računalniška šola Maribor Poklicna in strokovna šola	- electrician	- electrical technician	- electrical technician	
41. Srednja gradbena šola in gimnazija Maribor	- bricklayer - carpenter - izvajalec suhomontažne gradnje - tiler – setter of ceramic cladding - slikopleskar - črkoslikar	- construction technician	- construction technician	
42. Šolski center Ptuj Elektro in računalniška šola	- electrician	- electrical technician	- electrical technician	
43. Šolski center Ptuj Strojna šola	- fitter of mechanical installations - klepar - roofer	- mechanical technician	- mechanical technician	
44. Tehniški šolski center Maribor Srednja šola in dijaški dom	- fitter of mechanical installations	- mechanical technician	- mechanical technician	
45. Tehniški šolski center Maribor Višja strokovna šola	-	-	-	- mechanical engineering
46. Višja strokovna šola ACADEMIA Maribor	-	-	-	- civil engineering
POMURSKA REGIJA				
47. Dvojezična srednja šola Lendava	- tiler - setter of ceramic cladding(DV) - fitter of mechanical	- mechanical technician (DV)	- mechanical technician (DV)	

	installations (DV)			
48. Srednja poklicna in tehniška šola Murska Sobota	- joiner - electrician - fitter of mechanical installations	- mechanical technician - electrical technician	- mechanical technician - electrical technician	
SAVINJSKA REGIJA				
49. Šolski center Celje Srednja šola za kemijo, elekrotehniko in računalništvo	- electrician	- electrical technician		
50. Šolski center Celje Srednja šola za gradbeništvo in varovanje okolja	- carpenter - bricklayer - tiler – setter of ceramic cladding - izvajalec suhomontažne gradnje	- construction technician		
51. Šolski center Celje Srednja šola za strojništvo, mehatroniko in medije	- fitter of mechanical installations - klepar - roofer	- mechanical technician	- mechanical technician	
52. Šolski center Celje Višja strokovna šola	-	-	-	- civil engineering - mechanical engineering
53. Šolski center Slovenske Konjice – Zreče Srednja poklicna in strokovna šola Zreče	- fitter of mechanical installations	- mechanical technician		
54. Šolski center Velenje Elektro in računalniška šola	- electrician	- electrical technician	- electrical technician	
55. Šolski center Velenje Strojna šola	- fitter of mechanical installations	- mechanical technician	- mechanical technician	

SPODNJE POSAVSKA REGIJA				
56. Šolski center Krško – Sevnica Srednja poklicna in strokovna šola Krško	- electrician	- electrical technician - mechanical technician	- electrical technician - mechanical technician	
57. Šolski center Krško – Sevnica Srednja šola Sevnica	- joiner			
ZASAVSKA REGIJA				
58. Srednja tehniška in poklicna šola Trbovlje	- fitter of mechanical installations	- electrical technician - mechanical technician	- mechanical technician	

13.3 Build Up Skills Slovenia Poster



BACK COVER

BUILD UP Skills

The EU Sustainable Building Workforce Initiative in the field of energy efficiency and renewable energy

BUILD UP Skills is a strategic initiative under the Intelligent Energy Europe (IEE) programme to boost continuing or further education and training of craftsmen and other on-site construction workers and systems installers in the building sector. The final aim is to increase the number of qualified workers across Europe to deliver renovations offering a high energy performance as well as new, nearly zero-energy buildings. The initiative addresses skills in relation to energy efficiency and renewable energy in all types of buildings.

BUILD UP Skills has two phases:

I. First, the objective is to set up national qualification platforms and roadmaps to successfully train the building workforce in order to meet the targets for 2020 and beyond.

II. Based on these roadmaps, the second step is to facilitate the introduction of new and/or the upgrading of existing qualification and training schemes.

Throughout the whole duration of the initiative, regular exchange activities are organised at EU level to underline the European dimension of this important initiative and to foster the learning among countries.

The BUILD UP Skills Initiative contributes to the objectives of two flagship initiatives of the Commission's 'Europe 2020' strategy — 'Resource-efficient Europe' and 'An Agenda for new skills and jobs'. It is part of the Commission's Energy Efficiency Action Plan 2011. It will also enhance interactions with the existing structures and funding instruments like the European Social Fund (ESF) and the Lifelong Learning Programme and will be based on the European Qualification Framework (EQF) and its learning outcome approach.