Build-up Skills Slovakia

BUILD UP SKILLS
ENERGY TRAINING FOR BUILDERS

BUILD UP Skills – Slovakia

Roadmap

June 2013

The project is financed by the European Commission in the framework of the EU programme Intelligent Energy – Europe and initiative Build Up Skills – National Qualifications Platforms and Roadmaps (Pillar I).

Further information

More details on BUILD UP Skills Slovakia can be found at www.slovakia.buildupskills.eu

More details on BUILD UP Skills can be found at www.buildupskills.eu

More details on the IEE programme can be found at http://ec.europa.eu/intelligentenergy

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Foreword

For achieving the EU 2020 targets, to improve energy efficiency of buildings and to increase the share of the renewable energy sources in the energy mix of buildings, and to promote the contribution of the construction industry to the social and economic life of Slovakia, it is critical to ensure a high competence level of all craftsmen and workers at all levels in the sector. Demographic change has become one of the most pressing challenges we are facing at the beginning of the 21st century. One of the most dramatic, and indeed imminent, consequences of our ageing society concerns the shortage of skilled workforce.

The project partners in Build Up Skills Slovakia, National Qualification Platform, the Platform "Buildings for Future", therefore, have decided to agree on this Roadmap.

Ministry of Education, Science, Research and Sport of Slovakia, Ministry of Transport, Construction and Regional Development of Slovakia and Ministry of Economy of Slovakia endorsed[1] the Roadmap and included the proposed strategy, objectives and measures in the "Strategy for Setting up Complex System of Further Education and Training in the Sector of Buildings".

Giving craftsmen and on-site workers in the sector of buildings the ability to acquire new skills and qualifications throughout their life in order to adapt to change and requirements of the Resource Efficient Europe is a major challenge for employers in the sector. This helps to manage industrial, economic and technological changes in the sector of buildings by offering high levels of mobility and development.

As part of an open and constructive dialogue at the appropriate levels, stakeholders in the sector of buildings have an important role to play in tackling this challenge. This Roadmap allows us to work to support the "Europe 2020" strategy of the EU.

Build-up Skills Slovakia

National Qualification Platform

Association of Construction Entrepreneurs of Slovakia
(Project leader)

Zsolt Lukáč
President

Platform "Buildings for Future"

Association of Construction Entrepreneurs of Slovakia

[1] Letters of endorsement are attached in part 8

Co-signees from platform's members

Building Testing and Research Institute, n.o.

(Leader of the Status Quo Analysis)

Prof. Zuzana Sternová, PhD.
Director

Institute of Education and Services, s.r.o.

(Leader of the Roadmap development)

Marta Minarovičová
Director

Slovak Innovation and Energy Agency

(Leader of the endorsement process)

Ján Magyar
Senior Expert

Ekofond, n.f.

Eva Gulíková
Fund Manager

Slovak Standards Institute

Henrieta Tölgyessyová
Head of Unit
Construction and Transport

Secondary Vocational School Bratislava

Ľubomír Kovaľ
Headmaster

Slovak Green Building Council

Association for Renovation of Residential Buildings

Institute for Energy Passive Houses

Greenpeace Slovakia

Peter Robl
Secretary of the platform

1. Summary

In respect of the objectives of the Europe 2020 Strategy, the renovation as well as construction of new buildings should be linked to an intense use of renewable energy sources so as to make use of the important potential to reduce energy consumption. In terms of the Article 9 of the Directive of the European Parliament and the Council 2010/31/EU on energy performance of buildings, by 31 December 2020 all new buildings in the EU (by 31 December 2018 all new buildings used and owned by public authorities) should be nearly zero-energy buildings. It also introduces the obligatory reconstruction of the existing public buildings. Public sector should become a model in this area. A great attention is paid to long-term planning of reconstruction of all types of buildings, with emphasis on their significant renovation as well as quality of construction and better use of buildings. In order to create conditions for successful achievement of these framework objectives, it is necessary to successfully implement a whole range of policies, in particular as regards energy performance (EP), energy efficiency (EE) and use of renewable energy sources (RES) and further vocational education and training (VET).

In respect of their substance, required parameters and requirements put on the quality and technical discipline of construction as well as used technologies, nearly zero-energy buildings are different and more demanding to a large extent compared to the existing buildings. It requires changes also in the qualification of workers in the construction sector in the Slovak Republic who are to build or reconstruct such buildings. It is obvious that only highly qualified and educated workers will be able to implement and install the projected procedures and technologies so as to be able to build efficiently and operate these new or reconstructed buildings. Trends concerning the level of labour potential in construction sector indicate that a high qualification level, knowledge and skills are one of the decisive factors of competitiveness and further development of the Slovak construction sector.

It is very important that the construction professions adjust to these trends. The key target groups include in particular construction craftsmen who carry out construction work and workers who install technical systems in buildings, especially their parts related to energy consumption. Besides craftsmen, also managing and regulatory workers on a construction site (foremen, site managers, construction supervisors) are crucial to achieve the necessary quality of constructions (in particular in relation to the requirements on increased energy performance of buildings). These experts also have to supplement their qualification in terms of current and future requirements on modern building industry. Therefore, it is important to pay due attention to their lifelong education. It is assumed that the majority of graduates will come from a specialised education system at the level of secondary vocational schools of technical or electro-technical specialisation. Most probably, it will be necessary to support establishment of new, cross-section professions and their schooling. There is a need for specific policies and tools to support small and medium-size companies. These represent the majority of construction companies. It is assumed that the key role in adaptation of these groups of workers to new requirements will be played by further education that will be:

- The way for graduates to obtain another certificate in the studied specialisation from an accredited training course, or a certificate necessary to carry out a profession,
- The opportunity for workers in professions that are nowadays less needed to extend their qualification by such specialisation/profession that currently is or will be needed on the market in the near future.

According to the results of an analysis of the current situation prepared within the BUS SK Project, based on the experience with the current quality of work, employers presume that on average 31% of their employees and 43% of the employees of their sub-contractors (which means at least 40% of the estimated number of workers in the building construction, i.e. around 47,000 persons) will need enhancement of their qualification and additional training in the next years. This will concern in particular professions defined by the National Qualification Platform (NQP) as the crucial ones.

When implementing new requirements on skills and qualification in the building industry, it is necessary to take into account in particular the specifications and barriers of the construction sector in Slovakia, resulting from the analysis of the current situation.

In general, it is necessary to develop the following areas in the **key professions** through VET:

- Skills and knowledge related to use of new construction materials and technologies and their application,
- Knowledge of new technologies for EP and RES in buildings, including installation and assembly,
- Improved conditions for experts in the building industry via VET to understand the requirements by obtaining or extending their professional knowledge such as: studying of technical documentation and new technical regulations, foreign languages and technical terminology in foreign languages, etc.

The main and supporting objectives of the Roadmap for development of VET in the area of EE and RES

The Roadmap represents the basic framework for establishment and introduction of a comprehensive system of further education in the building sector. Its aim is to **define the set of measures to establish and introduce a comprehensive system for further education within the building sector and an action plan for its implementation, while distributing the responsibilities among the respective central bodies of the state administration and other involved entities**, as well as to propose the action plan implementation.

Based on the context of the general VET strategy in EP area and use of RES in buildings, the key structural and operation objectives are summed-up in Table 4.3, which illustrates:

- Four main objectives and two supporting objectives which together create the basis of the strategy,

- Recommended time sequence, in which the defined objectives are to be achieved so as to meet the EE objectives by 2020 (the objectives are divided into short-term ones: 2014 – 2014, medium-term objectives: 2016 – 2018 and long-term objectives: 2019 – 2020),
- The main stakeholders, who will be responsible for achievement of the objectives or who will play an important role in the achievement process.

It is necessary to mention that even if some objectives have to be fulfilled in a short-term or medium-term horizon; their validity will not cease to exist in the defined period, as it will be necessary to further monitor the situation in the respective area.
The main objectives are divided according to their focus into two groups:

1. **Main structural objectives (MO).** The structural objectives will be fulfilled by measures focusing on systematic changes (new programmes, changes in the content of the existing programmes) and qualification and certification schemes. These will focus also on activities concerning vocational education and re-training of workers in the building sector.
2. **Supporting objectives (SO).** Supporting objectives will focus on supporting the need of new intelligent solutions and use of RES (focusing on customers of the construction and energy sectors). These objectives will also focus on the total change in the population behaviour, without which it will not be realistic to achieve the EP objectives for 2020 (and we have to reflect also on the current considerations to make them even stricter).

The implementation part of fulfilling the Roadmap consists of the following parts:

Measures to ensure main and supporting objectives for VET in the construction sector in respect of the EU 2020 energy objectives: the aim of the measures is to ensure development of competencies (professional skills, professional knowledge and general competencies) relevant for achievement of EU objectives in EE by 2020, including the requirements of Directives 2009/28/EC, 2010/31/EU and 2012/27/EU (Annex no. 1).

The Action Plan to ensure implementation of measures: the Action Plan includes a time plan, resources necessary for implementation, assumed energy certification of buildings, necessary supportive measures and structural measures to monitor the development of requirements on professional skills and professional knowledge in the building sector, as well as to notify about possible problems on the labour market.

Before submitting the Roadmap for endorsement by the competent authorities, the Roadmap has been finalized and endorsed by other stakeholders. The efforts of the Pillar I project led to creation of the National Qualification Platform (NQP) affiliating government (relevant ministries), education institutions (vocational schools, tertiary education institutions), employers, chambers of craftsmen and professionals in the sector of buildings. Commitment of the Construction industry to play its role in achieving EU 2020 energy targets triggered creation of the platform “Buildings for Future”, which affiliates Association of Construction Entrepreneurs of Slovakia, Slovak Green Building Council, Association for Renovation of Residential Buildings, Institute for Energy Passive Houses and Greenpeace Slovakia. The aim of this platform is promoting energy efficiency through renovation of buildings in Slovakia.

Both platforms were very instrumental in commenting and contributing to the Roadmap draft and providing assessment from different perspectives of achieving the increase of energy efficiency and increase of share of renewable energy sources in the energy mix of buildings. The process of developing and endorsing the Roadmap was finalized at the NQP workshop, to which both platforms contributed, on 11 June 2013.

Already during drafting process, the Ministry of Economy of Slovakia and Ministry of Transport, Construction and Regional Development were involved in commenting the drafts of the Roadmap. This facilitated the further process of endorsement that followed. Ministry of Economy, Ministry of Transport, Construction and Regional Development of Slovakia and Ministry of Education of Slovakia took part in the endorsement process. On the basis of the Roadmap, the three ministries drafted and agreed on "Strategy for Setting up Complex System of Further Education and Training in the Sector of Buildings". The Strategy took on board the Roadmap and the proposed measures for achieving the key and supporting objectives, as well as the action plan proposed in the Roadmap.

The aim of the Strategy (similar to the Roadmap) is to define the strategy and the set of measures to establish and introduce a comprehensive system for further education within the building sector and an action plan for its implementation, while distributing the responsibilities among the respective central bodies of the state administration and other stakeholders, as well as to propose the action plan implementation. It focuses primarily on education of construction craftsmen carrying out construction work and installers of technical equipment in buildings. Their enhanced qualification, quality of work and observance of technological discipline in construction should result in gradually growing share of buildings with increasingly better quality, characterised by high energy efficiency. Subsequently, the buildings would meet the requirements of nearly zero-energy buildings. At the same time, the Strategy would enable better fulfilment of the obligations resulting for the Slovak Republic from the EU directives and fulfilment of the Europe 2020 Strategy as regards energy industry. Obtained experience should be reflected also in higher competitiveness of construction companies with a positive impact on GDP and employment rate in the Slovak Republic.

The Strategy also defines the framework requirements on financing of the proposed measures, which is primarily based on the use of Structural funds and EU financial mechanisms with a standard co-financing from the State Budget. Financing from the budgets of respective ministries is used to a limited extent. The process of endorsement has been concluded and the outcome was presented at the Final Project Conference on 18 November 2013. Main actors of the project and the endorsement process, including the State Secretary of Education, Science, Research and Sport took part in the conference. State Secretary, Mr Štefan Chudoba, conveyed personally the message of support from his ministry to the further efforts in materializing the Roadmap objectives. The "Strategy for Setting up Complex System of Further Education and Training in the Sector of Buildings" is pending the formal procedure for adoption by the Slovak Government.

2. Introduction

2.1 Context

Better construction and use of buildings in the EU will affect 42% of the final energy consumption, approximately 35% of greenhouse gas emissions[2] and more than 50% of all extracted raw materials, and may also help save as much as 30% of water[3]. Therefore, the current policies to support energy efficiency and use of renewable energy sources in buildings play a key role in meeting the EU 2020 energy objectives. Costs on buildings during their life cycle should be taken into consideration to a larger degree, rather than only initial costs, including the construction and demolition waste. Better infrastructure planning is a necessary precondition to achieve efficient use of sources in the building sector and mobility.

A significant improvement in the energy use during the life cycle will contribute to competitiveness of the construction sector and to development of buildings which make efficient use of energies. It requires active participation of the whole value chain in the construction industry. Specific policies are necessary to support small and medium-size companies which represent the majority of construction firms with the aim to invest into the methods of construction and procedures for efficient use of energies, and into the necessary vocational education.

In respect of the EU 2020 objectives, renovation, construction of buildings and infrastructure within the EU shall be carried out with a high extent of an efficient use of sources. To a large degree, the approach based on life cycle will be used; all new buildings in the EU will be nearly zero-energy buildings[4], with a high rate of efficient use of materials. An obligation to renovate the existing buildings has also been introduced[5], where a great attention is paid to long-term planning of renewal of all types of buildings with an emphasis on in-depth renovation as well as renovation of public buildings, which should serve as examples of energy performance of buildings[6]. As much as 70% of safe construction and demolition waste will be recycled[7].

In this respect the European Commission undertook, together with the Member States, to consider supporting investment plans into professional skills and professional knowledge (two key groups of competencies) and has adopted a series of measures[8]

[2] COM(2007) 860 final Commission Communication „A lead market initiative for Europe“
[3] COM(2007) 414 final Commission Communication „Addressing the challenge of water scarcity and droughts in the European Union“
[4] Directive 2010/31/EU of the European Parliament and the Council on the energy performance of buildings (revised wording)
[5] Article 9, Directive 2010/31/EU of the European Parliament and the Council on the energy performance of buildings (revised wording)
[6] Articles 4 and 5 of Directive 2012/27/EU of the European Parliament and the Council on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC
[7] Article 11, Directive 2008/98/EC of the European Parliament and the Council on waste and repealing certain Directives
[8] For instance COM/2012/433 final, Commission Communication on sustainable buildings (2013, etc.

2.2 Objectives of the Build-up Skills Slovakia Project and the Roadmap

The objective of the Build Up Skills Slovakia (BUSSK) is to prepare a national Roadmap to improve vocational education for occupations in the building sector, for workers at construction sites in order to react proactively to the challenges of "green economy" by 2020, in particular as regards energy efficiency (EE) and use of renewable energy sources (RES). The aim of the Roadmap is to propose measures and manner of their implementation so that Slovakia would be ready to fulfil the objectives in the area of energy performance of buildings by 2020.

The project focuses on the area of vocational education for workers at construction sites. For that reason, the project target groups are employees of construction firms and workers installing technologies and technical equipment in buildings.

In particular, the BUSSK Project focuses on:

1. **Status Quo Analysis**, which consists mainly of the following parts:

    - Analysis of national policies and strategies contributing to achievement of the EU 2020 energy objectives in buildings, including continuous vocational education and training(VET):
        - Analysis of national policy and strategy in respect of green professions and skills,
        - Analysis of national implementation of the European Qualifications Framework (EQF).
    - Analysis of statistics in the construction and building sector, including statistics of the current human resources in the construction industry (numbers of workers by crafts and qualifications).
    - Analysis of the existing requirements on vocational education and training (VET) – analysis of the current situation concerning further vocational education for craftsmen and other construction workers, including workers installing technical systems; analysis of how the existing VET schemes really made use of the national VET system for crafts and their relevant professions; courses and training schemes on energy efficiency and renewable energy sources in buildings and their surroundings (which exist but are not part of the national system of the continuous education); and relevant initiatives at national level supported by the EU.
    - Analysis of gaps in the existing skills and qualification needs by 2020. The analysis would focus on:
        - Development of labour force, including annual increment on the labour market after finishing formal education, and estimates by 2020,
        - Requirements on skills, including identification of new skills and the number of construction workers who will be trained in each sub-sector in order to achieve the level of skills to fulfil the EU energy efficiency objectives by 2020,
        - Qualification requirements and required qualification courses and schemes (new or requiring changes), number of required lecturers, training and accreditation schemes,
        - Monitoring needs, for example structural measures for monitoring of

the development of requirements on skills, potential systems of early notification about risks of inadequate offer on the labour markets (in respect of the demand structure) and lacking offer in certain professions.

- Analysis of barriers concerning qualification of construction workers which may prevent achievement of the EU 2020 energy efficiency objectives in Slovakia in terms of relevant commitments towards the EU.

The Status Quo Analysis dealt with all professions in the building sector and covered all EE and RES technologies and systems relevant for the Roadmap objectives. The results of the Status Quo Analysis are summed up in Chapter 3 of the Roadmap.

2. **Preparation of the Roadmap** aiming at:

- Identification of measures to overcome barriers and gaps in professional skills, professional knowledge and general competencies (professional knowledge and general competencies were supplemented on the basis of a request of employers as it is necessary to deal with all three groups of competencies),
- Incorporation of training on intelligent energy solutions via changes in the curriculum of courses and practical trainings,
- Specification of necessary measures in order to motivate investments into competencies and use of highly qualified labour force,
- Summary of new trends so that the trained professionals would be ready to meet the requirements defined by 2020.

The subject of the Roadmap is to:

- Define the general strategy to ensure educational needs with the aim to fulfil the EU 2020 energy efficiency objectives and BUSSK position within it,
- Identify the priority objectives and measures for relevant professions in order to ensure development of competencies (professional skills, professional knowledge and general competencies) relevant for achievement of the EU 2020 energy efficiency objectives, including requirements of Directives 2009/28/EC, 2010/31/EU and 2012/27/EU as defined in the Status Quo Analysis,
- Define an action plan for implementation of proposed measures, including time schedule, sources necessary for implementation, presumed energy certification of buildings, necessary supporting measures and structural measures for monitoring of development of requirements on professional skills and professional knowledge in the building sector as well as notification of possible problems on the labour market,
- Define monitoring of implementation of the proposed measures.

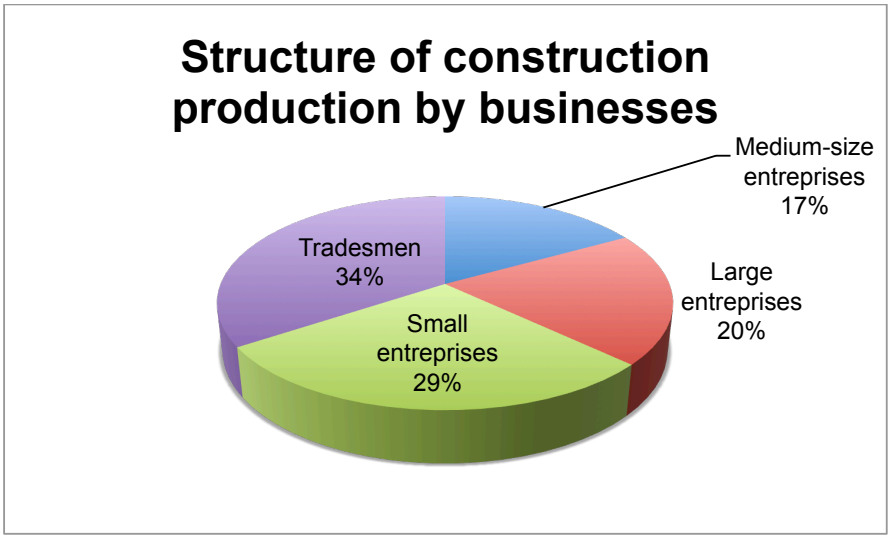
3. Situation in Slovakia at the time of the Roadmap development – findings from the Status Quo Analysis

3.1 Situation in the construction industry

Construction sector was developing gradually, especially after 1945. After 1989 an extensive restructuring took place in the construction sector in Slovakia. In 1997, buildings represented 1.006 million m^3 of the built-up area. In terms of share in per cent, heavy civil constructions represented 28%, industrial buildings 27%, residential buildings 24% and other than residential structures 21%. A significant expansion of investment activities in the construction sector commenced in 2000 with the highest growth reached in 2005 and 2006, when the actual growth rates in construction production exceeded double-digit figures (14.6 or 14.9% when expressed in fixed prices of 2005). This growth was, though, followed by a fall as a response to the global financial and economic crisis, with a negative peak reached in 2009, when construction production dropped by 9.1% Gradual downsizing occurred primarily in large construction companies, in particular related to construction of buildings and structures (residential and commercial). The mood of construction companies worsened again at the end of the year 2012, and the situation is expected to improve again in 2 – 3 years once prices are stabilised and property market renewed, which may also be supported by the announced PPP projects.

Once transformed, the organizational structure of Slovak construction sector was similar to that widely applied abroad. A natural hierarchy of small (up to 49 employees), medium-size (up to 250 employees) and large (more than 250 employees) enterprises was established with structure reflecting the structure of contracts and demand. Self-employed contractors, i.e. tradesmen active in construction sector, form a special group thereof. Each of these groups had established its natural place within the construction market.

Chart 3.1: Structure of construction by businesses in 2011 (tradesmen 34%; medium-size enterprises 17%; large enterprises 20%; small enterprises 29%)



Source: Slovak Construction Yearbook of 2012, ÚEOS, a.s., Ministry of Transport, Construction and Regional Development of the Slovak Republic, Bratislava, 2012.

Until the year 2011 (incl.), there were 1,889,845 apartments available both in residential and family houses in Slovakia. 1,377,315 apartments were built from 1946 to 1993, of which 785,608 are in apartment blocks and 586,296 in family houses.

A database of apartments records 800,634 apartments in 21,723 apartment blocks, split to 52,496 sections.

There is a database available in Slovakia of non-residential buildings not used for production that includes 15,435 buildings (of 3,765 managers) owned by the state and local authorities, which represent app. 114,703,652 m^3 of built-up volume.

Since 1st January 2008, energy certification is compulsory in the Slovak Republic. The issued energy certifications are registered by the Ministry of Transport, Construction and Regional Development since 1st January 2010. Energy certificates are not prepared for all new and particularly not for all reconstructed (renovated) buildings. Energy certificates audits have only commenced from 2013, as a three-level control.

As of 1st January 2013, the amendment to Act no. 555/2005 Coll. as amended by Act no. 300/2012 Coll.[9], and Decree of the MTCRD no. 364/2012 Coll.[10] became effective, implementing the revised version of Directive 2010/31/EU on energy performance of buildings. A new specimen of the energy certificate has been introduced, annexed by a report serving as a basis for audit of centrally registered energy certificates (in 2010: 9,342; 2011: 10,771 and 2012: 11,825).

Of the total number of apartments registered in both, family houses and blocks of apartments, about 383 thousand were insulated in 2001-2010, i.e. app. 20.5%. Of which:

- Family houses: 154 thousand apartments,
- Blocks of apartments: 229 thousand apartments.

In the Slovak Republic, there is no statistical data on energy and heat consumption in buildings connected to central heating source (CHS) and connected through entities selling heat by 2004. The Slovak Ministry of Economy is currently introducing a monitoring system to track efficiency of energy consumption which, besides other, includes a register of energy consumption for heating in buildings, as well as information on measures of energy efficiency carried out in respective buildings. The monitoring system is operated by Slovak Innovation and Energy Agency (SIEA).

3.2 Employment in the construction sector

The position of construction sector within the overall economy may be best assessed primarily by two indicators:

- Construction sector share in GDP production, and
- Construction sector share in the total employment in the national economy.

Construction sector share in GDP production (current prices) - the construction share in GDP gradually increased since 2005 from 6.1% up to 9.1%, in 2008. In 2009, this

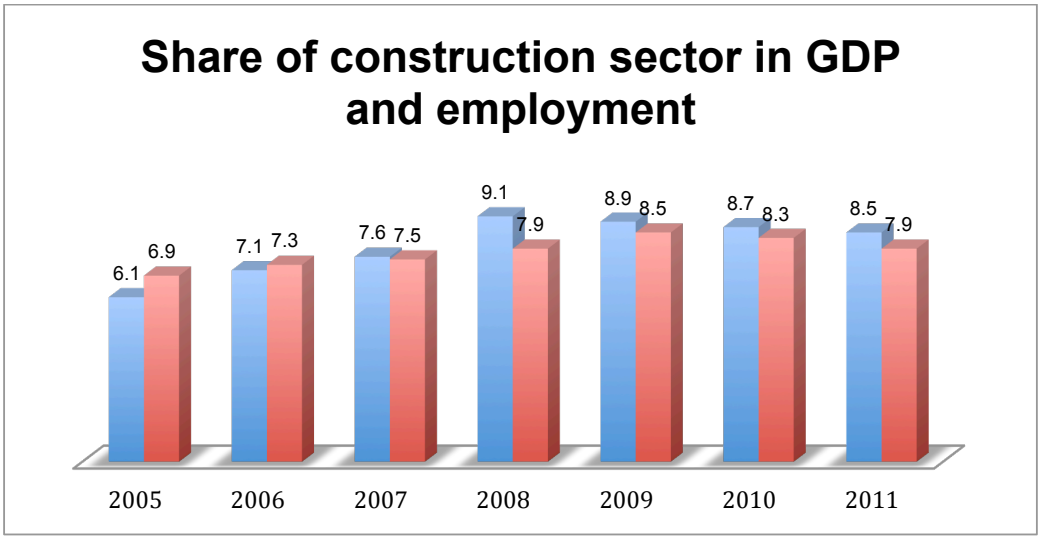
[9] Act no. 300/2012 Coll. amending and supplementing Act no.. 555/2005 Coll. on energy performance of buildings and on amendment and supplementing of certain acts as amended, and amending and supplementing Act no. 50/1976 Coll. on territorial pallning and building code (Building Act) as amended

[10] Decreed of MTCRD no. 364/2012 Coll. (to execute Act no. 555/2005 Coll. on energy performance of buildings and on amendment and supplementing of certain acts

figure reached 8.9% or 8.7% in 2010, respectively. In 2011, construction sector share in GDP reached 8.5%; i.e. a decrease by 0.2 % compared to 2010.

In respect of employment, construction sector as a whole contributed from 6.9% to 8.5% from 2005 until 2009. In 2010, this figure reached 8.3% and 7.9% in 2011; i.e. again a decrease by 0.4% compared to 2010.

Chart 3.2 Share of construction in GDP production and employment



Source: ÚEOS, a.s.

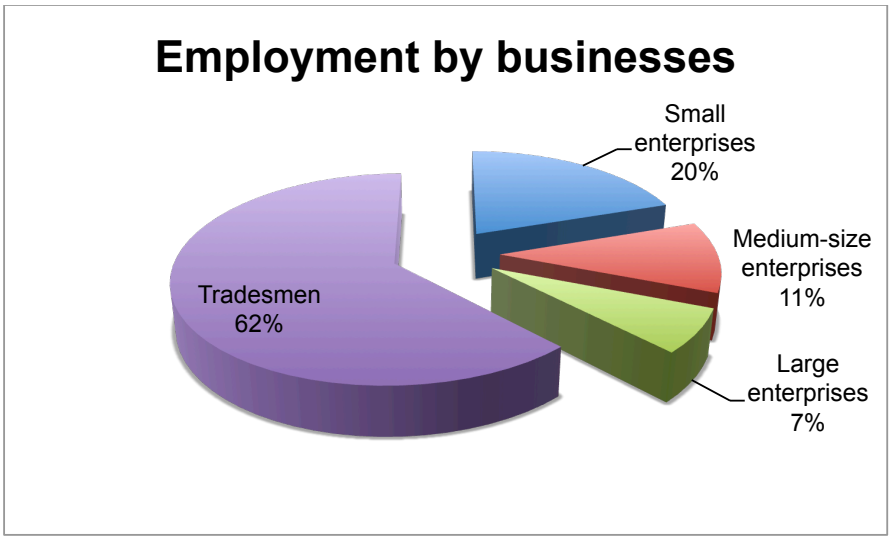
Changes which have occurred in the Slovak construction industry after 1990 were reflected also in employment within the sector. While before 2001 the employment was significantly on decline, since 2002 the number of employees in construction industry started to increase and already in 2005 the lack of qualified construction professionals started to be evident, in particular in worker professions, which culminated especially in 2007. In 2008 and 2009 182.1 thousand and 184.7 thousand employees respectively worked in the construction sector. In 2011 construction sector registered less employees, around 172.3 thousand persons and around 165.7 thousand persons from January to November 2012.

As regards the qualitative structure of employees in construction sector, it may be stated that in a long-term perspective the ratio of employees in managerial and worker positions has been stable, around 15 % to 85 %. In 2005, 142,751 persons were employed in the construction sector, of which 121,303 workers (i.e.85.0%), and in 2007 the total employment amounted to 165,192 persons, of which 139,173 workers (i.e. 84.2%).

Based on the Labour Force Survey by SO SR, out of the total number of around 233.7 persons in the Slovak construction sector, the following numbers were employed in 2011 pursuant to education: 2.7 % persons with elementary education, 48.0 % with apprentice education, 3.4% with completed secondary education without diploma (final secondary school leaving state examination), 6.0% with apprentice education with diploma, 2.3% with completed general secondary education, 28.5% with completed secondary vocational education, 0.3% with higher vocational education and 8.8% with university education. The overview clearly indicates that

employees with apprentice and completed secondary vocational education play a decisive role in construction sector, who represented around 76.5% of construction employees in 2011.

Chart 3.3 Employment by businesses (Tradesmen 62%, Small enterprises 20%, Medium-size enterprises 11%, Large enterprises 7%)



Source: ÚEOS-komercia, a.s.,2011

According to the methodology of the Labour Force Survey by SO SR, the employees include all persons aged 15 and over who worked at least one hour for a wage, salary or other remuneration during the monitored (reference) week, including persons working abroad. It includes full-time work or part-time work, permanent, temporary, occasional or seasonal work.

At the moment, the trend shows that students lose interest in vocational education and training in the construction area. The situation is signalled by both, schools as well as employers. Changes in economic conditions in the Slovak Republic have put an end to traditional employers, have caused a change in the focus of production and services, led to emerging of small businesses/sole traders and arrival of new foreign investors, which logically induced new demands and requirements on employers as regards professional knowledge, practical skills and competencies of graduates from individual specialisations at vocational schools.

The current cooperation between employers and vocational education and training institutions shows signs of voluntariness, even certain spontaneity, limited only to a certain form of cooperation such as, for instance, field trips of pupils, practical internships and trainings, sponsoring via material of financial aid, participation and membership of experts in specialised committees. The existing legislation only partially governs the relationship, individual activities and possible tasks of employers towards vocational education and training, the overall context is missing.

The lack of qualified labour force in the construction industry has been manifested also in its “aging”. E.g. in the company Doprastav the share of employees over 41 years of age accounted for as much as 63.3% in 2007 (whereas in Metrostav SK their share was 58%). A limited inflow of young employees which has continued in the last years, however, cannot replace the natural decline of employees. The lack of graduates from specialised building schools is caused by the low number of young

people trained for the profession on one hand, and by a general lack of interest in studying technical subjects on the other hand.

3.3 National policies to reach the EU 2020 energy objectives in construction sector and transposition of the requirements and the EU legislation focusing on energy efficiency and use of renewable energy sources.

The new draft Slovak Energy Policy was published on 16th May 2013. It fully focuses on supporting development of renewable energy sources and energy efficiency so as to be able to fulfil the Strategy 2020 objectives and national objectives (14% share of RES, 20% reduction of final energy consumption – FEC, FEC savings of 4.8 PJ per year) adopted by the Government.

As regards energy efficiency of buildings, the draft Energy Policy assumes that, given the current renovation trend, by 2020 around half of the existing buildings will be thermally insulated and the majority of buildings will be insulated by 2030. It is probable that it will be necessary to renovate also a certain number of buildings insulated before 2010. These trends will contribute to reduce the heat consumption. With the assumed increase in the life standard, the equipment of households will increase, which will cause growing electricity consumption to be partially compensated by replacement of appliances for energy-saving ones. The share of new nearly zero-energy buildings will increase. In respect of the requirements of Directive 2010/31/EU on energy performance of buildings, all new public buildings constructed as of 2019 and all buildings constructed as of 2021 should meet the requirements on nearly zero-energy buildings, in compliance with the national plan of increasing the number of nearly zero-energy buildings. Energy consumption in buildings will be directed also to higher use of renewable energy sources. In the building sector, the draft Energy Policy proposes the following measures in accordance with the requirements of the EU Directives:

- to achieve energy savings corresponding to an annual renewal of 3% of the surface area of buildings owned by state administration bodies pursuant to minimal requirements on energy performance of buildings, to prepare a list of state administration buildings and elaborate a long-term strategy of investment mobilisation for renovation of the state-owned buildings,
- to ensure continuity of existence of financial mechanisms focusing on systematic and comprehensive renovation of the existing buildings towards nearly zero-energy buildings, with an emphasis on cost-optimal use of the potential energy savings and high-quality construction work, to systematically support and ensure financing of construction of low-energy and passive buildings. It is necessary to ensure efficient use of public resources in existing as well as new financial mechanisms for support of construction or renovation of buildings.

Besides, the model role of the public sector will play an important role as regards application of the energy efficiency principles in public procurement.

The following other measures on energy efficiency seem suitable to be listed:

- a need to modify and extend the system of energy audits, qualification, accreditation and certification schemes, and to ensure sufficient preparedness and availability of experts through training programmes,
- a need to extend information to consumers and access to information on one´s own energy consumption at all levels, to develop professional knowledge of key implementing entities in public and private sectors through education programmes, consultancy, seminars, conferences and vocational trainings,

The draft Slovak Energy Policy focuses also on support and development of education and enhanced awareness in the energy sector.
One of the important preconditions of meeting the Energy Policy objectives is the training level of experts in the energy and related sectors as well as adequate awareness of lay public. As insufficient training and experience may have a negative impact on the quality of work at all levels, it is necessary to pay due attention to this area. The fact that training in the energy sector has lacked sufficient attention for a long time is confirmed also by the following findings:

- When communicating with the broad public it may be said that the basic information about the use of energies and energy sector is not sufficient and, which is even worse, knowledge about physical units in this area and in particular their multiples has substantially worsened,
- A common end consumer should assess own energy consumption and decide how much to consume, however, they are often not informed enough, especially in case of their heat needs
- The energy sector is sometimes presented in the media by reporters who have not made themselves familiar with the respective terminology (they often state performance in kilowatt-hour or volume of energy in kW) and thus enter wrong expressions also into the public awareness,
- Insufficient connection of secondary vocational schools as well as universities with the practical world will not prepare students for real conditions in the energy sector, where many of them are not able to find a job in the sector after graduating without additional training,
- New innovative technologies, in particular as regards use of RES and energy savings are often installed without any experience in the given area, and the installations in many cases do not take into consideration specific features of these technologies,
- Due to lacking financial as well as professional appraisal of civil engineering, further education represents an inadequate burden for experts on project planning, implementation and operation of energy facilities,
- When selecting employees in the energy sector, the priority often does not involve respective technical education and vocational practice.

Within the chapter focusing on education, the draft Slovak Energy Policy directly mentions the BUSSK Project. The need to enhance the quality of work in the energy-related areas is one of the preconditions for achieving the energy sector objectives. Especially the energy sector areas engaging independent entities need a certain guarantee of quality of work and carried-out activities. Slovakia has to examine whether its qualification, accreditation and certification schemes for energy experts are sufficient and whether they establish a sufficient qualitative basis to perform the required activities. For instance, in relation to measures being extended to energy savings in the buildings sector, the EC proposed the “BUILD UP SKILLS" initiative

focusing on analysis of education from the point of view of energy efficiency and renewable energy sources, and subsequent increased expertise through qualification programmes dedicated in particular to constructors and installers of technical equipment in buildings. Education of expert public should be extended also to the providers of energy services.

National policies on energy performance of buildings include:

- Energy Safety Strategy of the Slovak Republic (2008) - Chapter 6.4.3.1 Heat and cold: local heating and cooling of buildings by renewable energy resources. This document is mentioning biomass, solar energy, low potential heat (heat pumps) and geothermal energy in terms of meeting the aims of the 2020 Strategy, in Slovakia. Specific objectives and priorities in this area are given under 6.4.5.1. A plan to support the use of solar energy and biomass in the form of subsidies for households is one of the priorities in the area of heat and bio fuels.
- Energy Efficiency Strategy (2007) – deals with energy savings in family houses and apartments as well as in the tertial sector. The potential of energy savings is, among others, in continual improvement of thermal and technical characteristics of buildings, equipment of buildings with the regulatory technique and way of their operation as well as enhanced efficiency in turning fuel into heat and hot water, enhanced efficiency of distribution network pipelines. Energy savings could be reached mainly via using energy saving appliances, lightening, etc.
- Energy Efficiency Action Plan for 2008 – 2010 (2008) – describes the situation and existing measures in the buildings sector and proposes new measures in the sector (residential as well as non-residential). It proposes measures financed from both, Structural Funds as well as the proposed Energy Efficiency Fund, which however has not been established. The measures focus in particular on improvement of thermal performance of buildings, as well as on construction of buildings with better thermal and technical indicators, and implementation of legislative measures (e.g. hydraulic regulation of hot-water heating distribution, regular inspections of boilers, heating systems and air-conditioning systems).
- The Energy Efficiency Action Plan for 2011 – 2013 (2011) – includes an evaluation of the measures from the first Action Plan in the buildings and household sector (chapter 4.2), as well as continuing and new measures in the building sector for the period of 2011 – 2013 (chapters 7.1 and 7.3). The building sector is one of the main sectors to help achieve the energy efficiency objective in the future. The greatest energy savings have been achieved with the support from State Housing Development Fund and SLOVSEFF Programme.

- At the moment, the Slovak Ministry of Economy, in cooperation with other ministries, has been preparing the third Energy Efficiency Action Plan for 2014 – 2016 which, besides evaluating the existing measures and proposal of new ones, will also inform about implementation of obligations stemming from Directive 2012/27/EU.

Table 3.1

National indicative energy efficiency objectives in Slovakia	
Energy savings expressed as final energy consumption in the period of 2014 - 2020	130.69 PJ (3.12 Mtoe)
Energy efficiency objective expressed as the absolute value of final energy consumption in 2020	435.09 PJ (10.39 Mtoe)
Energy efficiency objective expressed as the absolute value of primary energy consumption in 2020	680.62 PJ (16.2 Mtoe)
Energy efficiency objective in % expressed in the form of final energy consumption	23 % (3,12 Mtoe)
Energy efficiency objective in % expressed in the form of primary energy consumption	20 % (4,07 Mtoe)

National policies aimed at energy performance of buildings and 2020 safety objectives include:

- Updating the Strategy for Energy Performance of Buildings by 2010 with an Outlook to 2020 (2012) – the Government approved the Strategy evaluation on April 13th 2011, and adopted Resolution 246 committing itself to prepare the Strategy update; the updated Strategy was approved by Government Resolution 336 of July 6th 2012. It lists a set of measures and procedures to achieve the objectives of the 2010/31/EU Directive, requiring to amend the amended Energy Performance Act N° 555/2005 Coll.(the original Energy Performance Act was adopted as the Act 300/2012 Coll. From September 18th 2012 with efficiency from January 1st 2013.). Furthermore, a new regulation implementing the Energy Performance Act - the Decree 364/2012 Coll. of November 12th 2012, issued by the Slovak Ministry of Transport, Construction and Regional Development - should become effective in 2012, envisaging stricter requirements for the minimum energy efficiency of buildings from January 1st 2013, January 1st, 2016 and January 1 2021.
- National Plan aimed to increase the number of nearly zero energy buildings (2012) - A document approved by the Slovak Ministry of Transport, Construction and Regional Development on November 19th 2012, sets interim goals. The design of nearly zero energy buildings needs be based on the fact that a building with a clean energy source changes its own character since it is based on renewable energy sources. It requires a completely different design, i.e. shape and orientation, good thermal protection of structures, especially the exterior walls, windows and doors, and customized technical equipment. The requirements on thermal and technical characteristics of construction structures and buildings result from revised thermal and technical norm STN 73 0540-2: 2012, which became effective on 1st January 2013. It stipulates the normative requirements on construction structures to meet the requirements on energy performance of buildings by achieving B energy class. The requirements on new buildings are to be met also by significantly reconstructed buildings, if functionally, technically and economically feasible. The recommended requirements are to become standardised as of 2016 and are to ensure reduction in the heat needs leading to fulfilment of preconditions for A1 energy class. The recommended target values,

together with application of renewable energy sources, are to achieve the level of nearly zero-energy buildings after 2020 with provable achievement of the global indicator of energy performance of buildings for primary energy in A0 energy class. The main precondition in the area is fulfilment of the objectives after 2018 (for new buildings, buildings residing and owned by public authorities), or 2020 (for all new buildings) is introduction of new topics to the training programmes of vocational schools.

- State Housing Policy to 2015 (2010) - approved by the Government Resolution 96 of February 3rd 2010, lists renovation of buildings among its long-term strategic priorities, in order to gradually reduce energy consumption of buildings, following provisions of the Act. 555/2005 Coll. It was noted that energy consumption in residential buildings built in particular before 1989 doesn´t comply with the public interest of sustainable development, their energy demand highly exceeds that of other EU member states with developed economies. This creates opportunities for significant savings in energy consumption, and thus, a potential reduction of cost for energy, lowering also CO_2 generation, which is in the interest of sustainable development.

Table 3.2 – Potential total energy savings of new buildings in the period of 2016 up to 2021

Estimated potential		2016	2017	2018	2019	2020	2021
Apartments	Unit number	7 000	7 000	7 000	7 000	7 000	7 000
	Savings of TJ/year	50,40	50,40	50,40	50,40	50,40	75,60
	Cumulative savings in TJ		100,80	151,20	201,60	252,00	327,60
Family houses	Unit number	8 000	8 000	8 000	8 000	8 000	8 000
	Savings of TJ/year	175,82	175,82	175,82	175,82	175,82	266,11
	Cumulative savings in TJ		351,64	527,46	703,28	879,10	1145,21
Administrative buildings	Unit number	110	110	110	110	110	110
	Savings of TJ/year	3,83	3,83	3,83	3,83	3,83	5,73

	Cumulative savings in TJ	7,66	11,49	15,32	19,15	24,88

Source: Updated concept of energy performance of buildings by 2010, with the perspective up to 2020, adopted by Slovak Government Resolution no. 336/2012 of 6th July 2012.

National policies aimed at the use of renewable energy in buildings include:

- Strategy for Higher Use of Renewable Energy Sources in Slovakia (2007) - The document sets out the objectives in this area by 2015, underlying the need to promote the use of solar energy and biomass for heating and hot water production in apartments and in family houses, in the form of subsidies for biomass boilers and solar systems.
- National Action Plan (NAP) for renewable energy sources (2010) - contains an overview of policies and measures (current / planned) to promote the use of energy from renewable sources (Chapter 4.1.).

Overview of activities planned within the implementation of the revised Energy Performance of Buildings Directive and the Directive on promotion of the use of energy from renewable resources (National Action Plan for Renewable Energy Sources):

- In terms of implementing the revised wording of the Energy Performance of Buildings Directive (EPBD) translated into the Act N° 555/2005 Coll. As amended, and the Act N° 300/2012 Coll., it is assumed that technical, environmental and economic feasibility to use high-performance alternative energy systems based on renewable energy source needs to be considered while designing a new building. According to the Building Act N° 50/1976 Coll., a project architect is required to use adequate structures and alternative energy systems based on renewable energy, as well as automated control and monitoring systems when designing a new building and planning a major renovation of an existing buildings, taking into account technical, functional and economic aspects, as well.
- Activities specified in the Article 13.3 of the Directive 2009/28/EC for renewable energy sources, are listed under Chap. 4.2.3 of the NAP. The goal is to focus on increased local heat and/or electricity supply to buildings.
- Measures resulting from the NAP to increase the use of renewable sources in the construction sector are:
  - To introduce energy audits for selected types of buildings
  - To issue guidelines for the use of renewable energy sources in buildings (Art. 14 para 5), and its application is to be made mandatory for new and significantly renovated buildings
  - To issue guidelines for the use of renewable energy sources in regional/local urban centres
  - To update and audit of fulfilment of the "Heat energy development strategy at municipal level"

- To issue a methodology for calculating cost-optimal levels of minimum energy performance requirements for buildings, and its application to be made mandatory for new buildings and adequately mandatory application for existing buildings
- To institutionalize a specialised training schemes for installers; institutionalize a specialised training schemes for project designers and architects in order to be able to evaluate the appropriate mix of renewable energy sources and energy efficiency measures in planning, designing, construction and reconstruction of buildings
- To promote energy services using renewable energy in buildings
- To support program for biomass boilers and solar collectors in households.

The draft of new Slovak Energy Policy published on 16th May 2013 supports development of renewable energy sources, while as one of the measures it proposes to support mechanisms enabling local and distributed installations of renewable energy sources which will be transferred from support by extra allowance to other mechanisms with less burden to the end consumer.

Table 3.3 – Estimated share of energy from renewable sources in the construction sector (in %):

Sector	2005	2010	2015	2020
Residential	1	4	7	12
Commercial	1	2	4	8
Public	1	2	4	8
Industrial	1	1	2	3
Cumulative	1	3	5	9

Source: Ministry of Economy of the Slovak Republic (National Action Plan for RES, 2010).

3.4 Existing provisions on vocational education in the buildings sector

The Government approved the Strategy of Lifelong Learning and Lifelong Counselling in April 2007 (hereinafter referred to as the "Strategy 2007"), and it is expected to be accomplished in 2015. It identified a number of key priorities to promote lifelong learning in the Slovak Republic.

One of the Strategy 2007 outcomes was the Act N° 568/2009 Coll. adopted in December 2009, on lifelong learning and on amendments to certain laws, which provided a number of important tools for further development of lifelong learning, such as accreditation based on qualification standards, recognition of achieved training outcomes, monitoring and forecasting of training needs. These tools, though, had not been put into practice yet, mainly because the project to promote on-going education, under which these tools were supposed to be developed, has not been implemented, yet. Likewise, sufficiently focused and coordinated actions of all stakeholders failed.

The main actors in the system of lifelong learning are people, educational institutions, counselling centres, employers, professional and trade associations, as well as local and regional authorities, recruitment agencies and NGOs. Together, these actors must be involved in identification, development and application of tools mentioned above.

The National Programme of Reforms in the Slovak Republic 2011 – 2014 recognises the growing importance of lifelong learning in view of the increasing dynamics in the society. The Strategy of Lifelong Learning 2011 has been adopted.

No such term as the “green skills” and “green professions” are defined nor introduced in the Slovak Republic. Therefore, any of the definitions defined in other countries may be adopted.

There are voluntary independent professional associations of experts in Slovakia – called Sector Councils, with two of these being especially relevant for Build Up Skills – Construction Sector Council and Energy, Gas and Electricity Sector Council.

The Act N°184/2009 Coll. governs the coordination of vocational education and training for labour market at:

- National level,
- Regional level.

There are other actors involved in the process of vocational education in Slovakia – professional guilds, Slovak Chamber of Tradesmen, Slovak Tradesmen Union and other professional associations.

The Lifelong Learning Strategy prepared by the National Lifelong Learning Institute (2012) defines the vision and concept for the future. The concept of lifelong learning is based on the document of the European Commission called Memorandum on Lifelong Learning, and complies with the strategic documents of the Slovak Republic dealing with education and employment. Individual objectives of the concept are in accordance with the main principles of sustainable development of lifelong learning, broken down into key priorities of the vision:

- Lifelong learning will be attractive for every citizen of the Slovak Republic and supported by all stakeholders.
- Schools and educational institutions of further education will provide education matching the labour market needs and social career, in cooperation with employers.
- Counselling services in career orientation and training options will be available for anyone interested.
- Barriers to lifelong learning will be removed so people can learn anytime when their skills and competencies will become obsolete for labour market.
- Professional and specialised associations will actively promote further education.

As regards secondary school, there is a steady decline of students due to a decrease in the number of children interested in vocational schools, and optimization of school network. Since 2008 it has not been possible to monitor separately apprentice schools (SOU) because they were renamed to secondary vocational schools (SOŠ). In 2011 there were 470 secondary vocational schools attended by 168,974 students.

However, secondary schools participated in the Ekofond Project for schools are a contrary example. Interest in studying at these schools has been higher than they can accept, while often it is the only school in the region which may choose from among the applicants.

3.5 Skills and qualification needs

The Communication from the Commission called "New Skills for New Jobs. Anticipating and matching labour market and skills need" states the requirement on linking the proposal and structure of skills with the practical requirements. For that reason it is necessary to clearly consider the requirements on buildings in 2020 and thus everything a graduate has to learn so that he/she would be able to carry out the required activity in a qualified manner within the BUSSK Project. The policies of the Member States on education, vocational training and employment have to focus on increasing and adapting the skills and provision of broader options of education at all levels to establish highly-qualified labour force corresponding to the needs of the economy. Vocational training and education systems have to bring new skills, match the character of newly created jobs, as well as improve adaptability and employability of adults who are already part of the labour force. Disharmony between skills and labour market needs represent a growing problem in the majority of Member States. Workers and enterprises do not have the necessary level of skills in the right areas due to bad information level and structural inflexibility, which damages the competitiveness of small enterprises, in particular. The structure of skills obtained at universities and within vocational training systems in the EU does not fully support the innovation-based economy. Several mutually interconnected factors will stimulate the demand for better-quality and adapted skills: globalisation and growth of international commerce, transfer to economy with low carbon emissions, use of technologies, in particular IKT, and changes in work organisation, which themselves are partly a consequence of technological changes and enhanced skills. Transfer to low carbon-emission economy will have a significant impact on employment, especially in the area of energy sector, water and waste processing, construction, transport, industry, agriculture and forestry.

Efforts to increase the productivity and use of "smart" technologies and precise assembly of building elements that would minimize waste, complex structures composed of materials with different characteristics, increasingly sophisticated semiproducts, but also requirements for tightness of passive buildings and interaction of their individual technical components, require a consistent coordination of all construction professions. Traditional crafts are being modified and shifted towards engineering. In certain cases, the difference between work of a craftsman and a technician who installed the equipment, almost disappeared. The fact that main contractors often subcontract specialized construction companies to carry out specialized works, is very important.

In addition to traditional crafts, there is a variety of new specialisations and a change in the focus of traditional professions. Below is an overview of professions influenced by technical development in the past and recently, in Slovakia:

- Bricklayer (shell construction)
- Installers/assemblers of concrete and steel structures
- Concrete and steel workers
- Plasterers, dry mounting and wooden structures installers/assemblers

- Machine and crane operator, scaffolding assembler
- Insulators
- Installers
- Installer, installer of sanitary equipment
- Plumber, heating engineer
- Stonemason, chimney sweeper
- Carpenter
- Roofer
- Tinsmith
- Joiner
- Locksmith
- Floor layers (floorers)
- Painters, wall paper layers
- Bricklayer in associated building production
- Heavy current electrician
- Electrician of light current wiring
- HVAC installers
- Installation of additional equipment

Generally, manual skills of employees in the Slovak construction sector are considered to be very good. Professional quality of Slovak workers is well perceived abroad, as well. The situation is significantly worse in work ethics of blue-collar professions. This problem is solved simply by the market itself.

While in 2007 and 2008 - during Slovak construction boom - there was lack of almost all professions, nowadays - due to the ongoing global crisis - there is a significant downsizing in the number of employees, especially in blue-collar occupations. Labour mobility used to be one of the weaknesses of the Slovak construction in the past, nowadays, however, there is a surplus of workers at the labour market and no mobility issues. Low productivity of labour in the construction sector, though, remains to be a weakness. Development trends of labour force potential imply that a high qualification and professional qualities, knowledge and skills are crucial for competitiveness and further development of the Slovak construction.

Besides craftsmen, managing and supervising professions at construction sites (foremen, site managers, construction supervisors) are also very important to achieve the necessary quality of constructions under changing requirements on construction quality - these experts also need to supplement their education in terms of current and future requirements on modern construction industry, and due attention has to be paid also to their lifelong learning.

In order to estimate the number of employees in various professions, training courses and additional training to improve skills and qualifications, the following extrapolation of construction sector statistical data of in Slovakia for 2011 was prepared. The construction production in Slovakia in 2011 amounted €5.653 billion; thereof residential buildings were €1.187 billion, and non-residential buildings amounted to €2.555 billion. Project focus (energy demand reduction) is neglected in civil constructions and other works. The average annual productivity was €31,571 per employee in the construction sector, in 2011. Based on these data, the number of

workers needed to work on certain building structures can be estimated, knowing shares of these in different types of constructions/buildings.

Table 3.4 – Estimated number of workers working on structures in land construction

Seriel nr.	Title of construction	Estimated nr. of workers
1	Foundations including groundwork	9950
2	Vertical structures	25370
3	Ceilings	10300
4	Staircases	2760
5	Roofing without tiles	9150
6	Roof tiles	2790
7	Tinsmith structures	1200
8	Exterior surfaces	3550
9	Interior surfaces	7510
10	Interior ceramic tiles	1390
11	Doors and gates	3770
12	Windows	5510
13	Floor surfaces	4370
14	Heating	3480
15	Electrical installations	6340
16	Lightning conductor	1200
17	Interior water piping	2340
18	Interior sewage piping	2340
19	Interior gas distribution	980
20	Elevators	6560
21	Others	6560
22	Hot water production	1580
23	Kitchen equipment	760
24	Interior sanitary facilities	2690
25	Bathroom unit excl. piping	1490
TOTAL		118550

The survey oriented on construction firms (employers) did not discover a single or at least prevailing opinion on the sufficiency of qualified employees in professions leading to reduced energy consumption or use of RES.

However, in 2020 a building will have to meet certain required parameters. The building will comprise an installation of an own energy source to generate electricity and heat. Regulation of energy consumption in the building will be through a central regulation system, often connected through Wi-Fi or internet. From this point of view it is crucial for professions to adapt to the trends in order to be able to achieve education also in these sectors. It is assumed that the majority of graduates will come from a specialised education system at the level of secondary vocational schools of technical or electro-technical specialisation. Most probably it will be necessary to create new professions, such as for instance technician of building energy facilities, or installer of renewable energy sources.

Based on experience with the current quality of work, employers assume that 31 % of their employees and 43 % of their sub-contractors´ employees will need additional

training, on average. Based on the fact that assessment of one´s own workers (by all respondents) is always more positive compared to their sub-contractors´ workers, it is assumed that additional training will be needed for approximately 40% of all workers.

3.6 Barriers

Barriers to achievement of the 2020 objectives have been identified in two areas. The first barrier concerns primarily schools and education system. The second area involves barriers concerning the current construction market which represent also the current situation as regards macro economy, sociology and demography, because all these areas contribute to create an ambient where construction sector is active.

Weaknesses of the Slovak construction sector:

- decreasing number of skilled craftsmen, specialised workers
- low numbers of students at secondary vocational schools and low qualifications of their graduates
- insufficient qualification level of gradutes from these schools
- insufficient language skills of specialised workers
- insufficient language skills of graduates (secondary vocational schools and Universities)
- low prestige of construction sector in the society related to low attractiveness of the work environment
- insufficient work productivity
- low payment discipline
- constructions completion deadlines, different quality of work of small and medium-sized companies
- insufficient quality control and work performance
- insufficient construction companies marketing
- stagnation of R&D and innovation activities
- unfavourable demographic development
- unemployment rate with significant regional disparities and uneven supply of jobs
- high level of long-term unemployment rate
- low standard of living of population due to regional discrepancies
- low impact of active labour market policies to promote the employability of unemployed and groups at risk of social exclusion
- high rate of unemployment among people with low education
- insufficient re-training, which is incorrectly targeted and inefficient
- insufficient links between educational system and labour market
- underdeveloped systems for forecasting changes in labour market qualification needs
- insufficiently linked active vocational education and training with preparation for knowledge-based society and its needs
- no comprehensive system of continuing education
- no model ensuring for participation of social partners in financing of vocational training financing
- graduates and high-risk groups face problems in finding a job
- unsatisfactory structure of unemployed in terms of innovative sectoral needs

- no tools for creation of pressure for increase of quality of buildings and qualifications of all involved workers
- low support of small sole traders and craftsmen development on the side of the Government
- failure to comply with time and new technologies outside the building industry.

The main problems in the development of a new field of study and accreditation are:

- high number of secondary vocational schools lacking students, unclear development strategy only spontaneously reflecting real needs
- Insufficient connection between school and practice and school and the building sector
- insufficient recognition of social status of graduates from secondary vocational schools
- poor and unclear requirements for technology changes in the coming years
- schools are closed - not used to actively participate in a dialogue and search for partners in order to target their courses more effectively, or to improve training and material equipment in schools, or to gain other social partners
- schools are passive - no professionals nor capacities to raise funds from sources other than from its founder
- the rate and ways of the school to get involved in the professional organizations is low
- inflexible approach of some school principals – they are teachers rather than managers
- teachers - low motivation to a change
- low engagement of schools in professional organizations
- employers - potential partners for schools - not used to proactively address partnerships with schools, busy, and are difficult to communicate with
- legislative obstacles - too many different methods and regulations, norms and procedures needed to be observed when preparing and accrediting a new programme
- apathy on the side of the Ministry of Education
- National Institute of Vocational Training is not flexible
- lack of recent textbooks on technical subjects
- inability to obtain funding for textbooks while a field of study is in pilot (experimental) testing
- lack of financial resources
- Vocational Education and Training Development Fund is not functioning
- allocation of core competencies in designing and implementing vocational education and training strategies
- refusal of new requirements and new technologies.

4. Strategy to remove identified shortcomings in education, and priority objectives

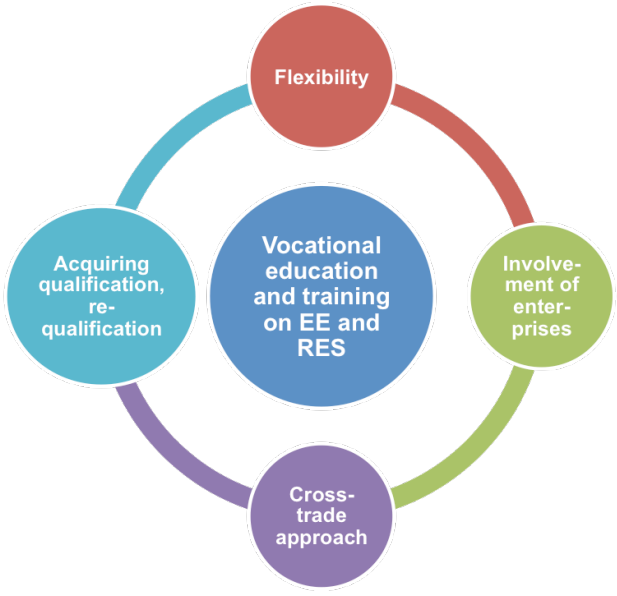
4.1 Strategy of continuous education in the buildings sector

The main idea to overcome the identified barriers is to support education that would bring along an added value to people and enterprises in the buildings sector, in particular by:

- **Education flexibility:** modular training courses with the possibility of cumulating credits, and education making use of the latest information and communication technologies, e.g. e-learning.
- **Involving enterprises into education and training:** tailor-made education and training for the needs of enterprises and adapted to practical conditions of companies in order to increase the practical aspects of training and efficiency of invested costs on employee education and training.
- **Cross-section approach to education as regards energy efficiency and use of renewable energy sources in the buildings sector:** the concept of energy efficiency and use of renewable energy sources is a cross-section area of national economy, which includes also all construction and assembly professions at construction sites.
- **Re-qualification, enhanced qualification:** specific programmes taking into consideration the economic and social situation in Slovakia will be implemented. Re-qualification will include the existing employees and tradesmen providing work and services in the buildings sector as well as unemployed with the aim to include them into the construction industry in professions focusing on energy efficiency and use of renewable energy sources.

Chart 3.1:

General VET strategy focusing on EE and use of RES in the buildings sector



4.2 Implementation scheme of new approaches to vocational education in the buildings sector

Further education focusing on energy efficiency (EE) of buildings and use of renewable energy sources (RES) includes the period from concluded formal education until the end of active employment in the buildings sector.

The scheme of further education for EE and use of RES in buildings includes the following 3 main parts:

- **Stakeholder network –** National Qualification Platform (NQP) has played an important role in preparation of the Status Quo Analysis (SQA) and this Roadmap. After completion of Pillar 1 of the Build Up Skills Project, NQP will be transformed into a network of vocational training stakeholders. The network will help to coordinate the vocational education and training policy (VET). It will also help to identify sources for VET as regards EE and RES in the buildings sector. It is assumed that NQP will update the Roadmap and monitor the progress of its implementation.
- **Competency Centre for education in EE and use of RES in buildings (KCEB) –** The Competency Centre is a team of experts and a network of specialised workplaces in the VET area which have a mandate and are under coordination of the Employers Association in the buildings sector, and will prepare methodological and education resources based on specific projects supported by public funding (EU funds, state budget). The resources include, in particular: education programmes and training units to incorporate EE and RES into vocational education and training of all levels and all relevant professions, a network of trained lecturers to provide vocational education, support of innovative training methods and rules for testing and certification of re-/trained participants of trainings.
- **VET providers –** a network of specialised workplaces focusing on extending VET in respect of EE and RES in the buildings sector to all Slovak regions.

In the effort to ensure maximal efficiency of used means to achieve the set objectives (prevention of parallel tasks, use of synergy effects etc.) the Build Up Skills initiative will be interconnected with relevant projects in the VET area. Thus, the initiative sustainability will be strengthened also after completion of the project under Pillar 1 and its continuation will not depend on grants under Pillar 2.

From among relevant projects, the initiative will be closely connected especially with the following relevant VET projects and initiatives:

- Establishment of regional competency centres for construction sector on the basis of secondary vocational schools – marked by * in picture 4.2,
- Supplementing the competency register (professional skills, professional knowledge and general competencies) and occupations – marked by ** in picture 4.2,
- Establishment of a qualification register – marked by *** in picture 4.2,

- Activities of national sector councils for construction sector, energy, gas and electricity sectors (including recommendations of the European Sector Council for Construction Industry) – marked by **** in picture 4.2,
- "Skills alliances" initiative of the European Commission – marked by ***** in picture 4.2.

4.2.1 Orientation of the Competency Centre of education on energy efficiency and use of renewable energy sources in buildings

The National Qualification Platform defined the following key professions as the main target group[11] to focus on the work of the Competency Centre of education for energy efficiency and use of renewable energy sources in buildings (KCEB):

Table 4.1

Key construction professions related to EE and RES	Key professions for installation of technical facilities in buildings and technologies related to EE and RES
Bricklayer (including insulation installer, tile layer, plasterer)	Plumber, installer of sanity equipment
Roofer	HVAC installer, hot-water preparation (including gas equipment)
Installer of fittings into construction openings	Construction and furniture joiner
Installer of hydro insulation	Locksmith
Installer of external cladding	Electrician of light-current wiring
Concrete and steel worker	HVAC installer
Mechanic	Technician for energy equipment in buildings
Crane operator	Installer of photovoltaic systems
Scaffolder	Installer of system lighting
Installer of concrete and steel structures	Solar energy technician
Installer of wooden structures	Technician for energy from renewable

[11] These key professions, competencies (professional knowledge and skills, general competencies) need to be developed as a priority as regards the human resources situation in the Slovak construction sector. The list does not include all professions and mandatory competencies. These are defined in the dabatases of competencies, professions and qualifications of the Slovak Republic prepared by Sector Councils for constrcution sector and energy sector, based on the European Qualifications Framework (EQF).

	sources
Stonemason	Technician/Manager of low-carbon operation
Chimney sweeper	Electrician of heavy-current wiring
Floorer	
Painter, paper-wall layer, tile layer, paving layer	
Bricklayer in PSV (including dry mounting, plaster cardboard)	
Construction locksmithing (including artistic locksmithing)	
Key vocational skills and general competencies necessary to develop in the above professions*	
Understanding of technical documentation	Knowledge of mechanisation and machines
Manual skills	Command of simple machine tools
Physical skills	Command of common electric hand tools
Application of theoretical knowledge in concrete work skills	Bending and welding
Operation of machines and equipment	Technological discipline
Technical literacy	Sense for details and their high-quality performance
Application of own experience and experience of others	
Sharing of experience with co-workers	
Ability to deliver required quality in required time	
Time management	

Leadership	
Key professional knowledge necessary to develop in the above professions*	
Intelligent energy solutions	Renewable energy sources – their principle and use
Dry mounting	Bending and welding
Measurement methods	Metal machining
Technologies used in the respective profession	Electric welding
Sequence of technological procedures	Principles of electricity generation
Characteristics and structure of materials, conditions and limits of their use	Distribution networks and regulations
Operation and use of machines, tools, appliances and aids	Mixing of paints, oil and synthetic varnishes
Technical regulations (including technical norms)	Distributors, lightning rods
Foreign languages – technical terminology	Antennae, communication and signalling devices
Occupational health and safety regulations	Technologies of materials application
Welding of plastic	

KCEB will also focus on re-training and preparation for tests to award certificates in compliance with Article 14(3) of Directive 2009/28/EC for **installers of small-volume boilers and biomass furnaces, solar photovoltaic and solar thermal systems, shallow geothermal systems as well as heat pumps**.

As regards technical professions, the following ones have been identified as the key professions to increase EE and use of RES, requiring immediate attention:

Table 4.2

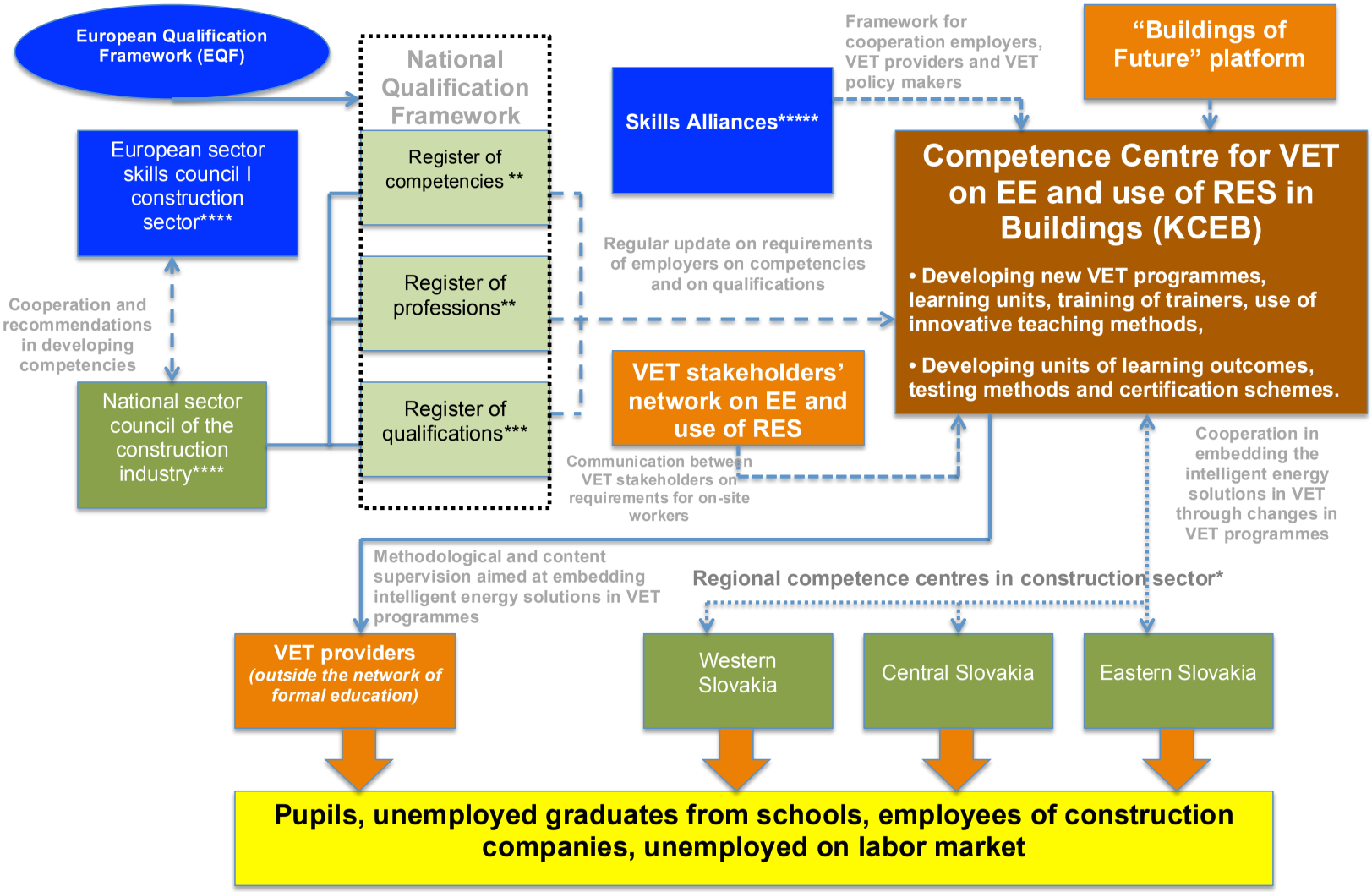
Proffessions	**Specific skills and knowledge to be developed**
Energy counsellors	Broad knowledge of energy flows and procedures, energy efficiency, efficient use of sources, renewable energy

	sources. Broad knowledge of projecting energy-efficient buildings and nearly zero-energy buildings, integrated design and schemes of sustainability assessment.
Architects, designers	Low-carbon designer skills, life-cycle costs of buildings, assessment of energy flows and procedures. Knowledge and skills in designing energy-efficient and low-emission buildings (including their structural, material and technical solutions), nearly zero-energy buildings, integrated designing and schemes of sustainability assessment with emphasis on energy objectives.
Planners	Broad knowledge of energy flows and procedures, energy and source efficiency, renewable energy sources. Knowledge of low-carbon (as regards energy consumption) materials and assembly procedures, knowledge of energy objectives, participatory planning
City planners and territorial planners	Knowledge of energy policy objectives and territorial tools to achieve them, participatory approach to planning, participation in integrated planning processes.
Civil engineers, site managers	Broad knowledge of energy flows and procedures, energy and source efficiency, renewable energy sources. Knowledge of low-carbon (as regards energy consumption) materials and assembly procedures, knowledge of energy objectives. Knowledge and skills in solving and implementing energy-efficient and low-emission buildings (including their assembly processes) and nearly zero-energy buildings, as well as integrated designing and schemes of sustainability assessment within the life cycle of buildings with emphasis on energy objectives.
Assessors of achieved energy outcomes,	Knowledge of energy policy objectives

certifiers, controllers	and manners to achieve them (including integrated planning), knowledge of solutions of energy-efficient and low-emission buildings and nearly zero-energy buildings, as well as assessment schemes for energy efficiency and sustainability within the life cycle of buildings (including knowledge of consequences of any shortcomings and flaws in design or implementation).
Site supervisors	Knowledge of processes and quality norms of completed work necessary to achieve low-carbon requirements. Knowledge of solutions and implementation of energy-–efficient and low-emission buildings and nearly zero-energy buildings with emphasis on quality control of construction work and processes.
Specialist verifying functionality of building systems	Adequate technical education to be able to verify functionality of the building systems. Ability to work with building designers and constructors so as to take into consideration requirements to verify functionality in every phase of the project and so as the systems would work correctly as designed.
Certifier of building sustainability	Vocational competency in one of the internationally acknowledged certification systems for sustainable buildings (e.g. BREEAM®, LEED®, DGNB®).
Manager of sustainable buildings operation	Vocational competency in managing of building operation pursuant to norms of the series STN EN 15221 (facility management). Knowledge of the criteria to assess building sustainability and processes to manage building operation.

The Status Quo Analysis concluded that a minimum of 40% of the estimated number of workers in building construction (see Table 3.4), i.e. around 47,000 persons, will need a training/course or other form of enhancing of their qualification in the years to come.

Picture 4.2: **Scheme of vocational education and training (VET) in Slovakia in the buildings sector for EE and RES**



4.3 Key objectives and supporting objectives of the Roadmap

Based on the context of the general VET strategy in EE area and use of RES in buildings, the key structural and operation objectives are summed-up in Table 4.3, which illustrates:

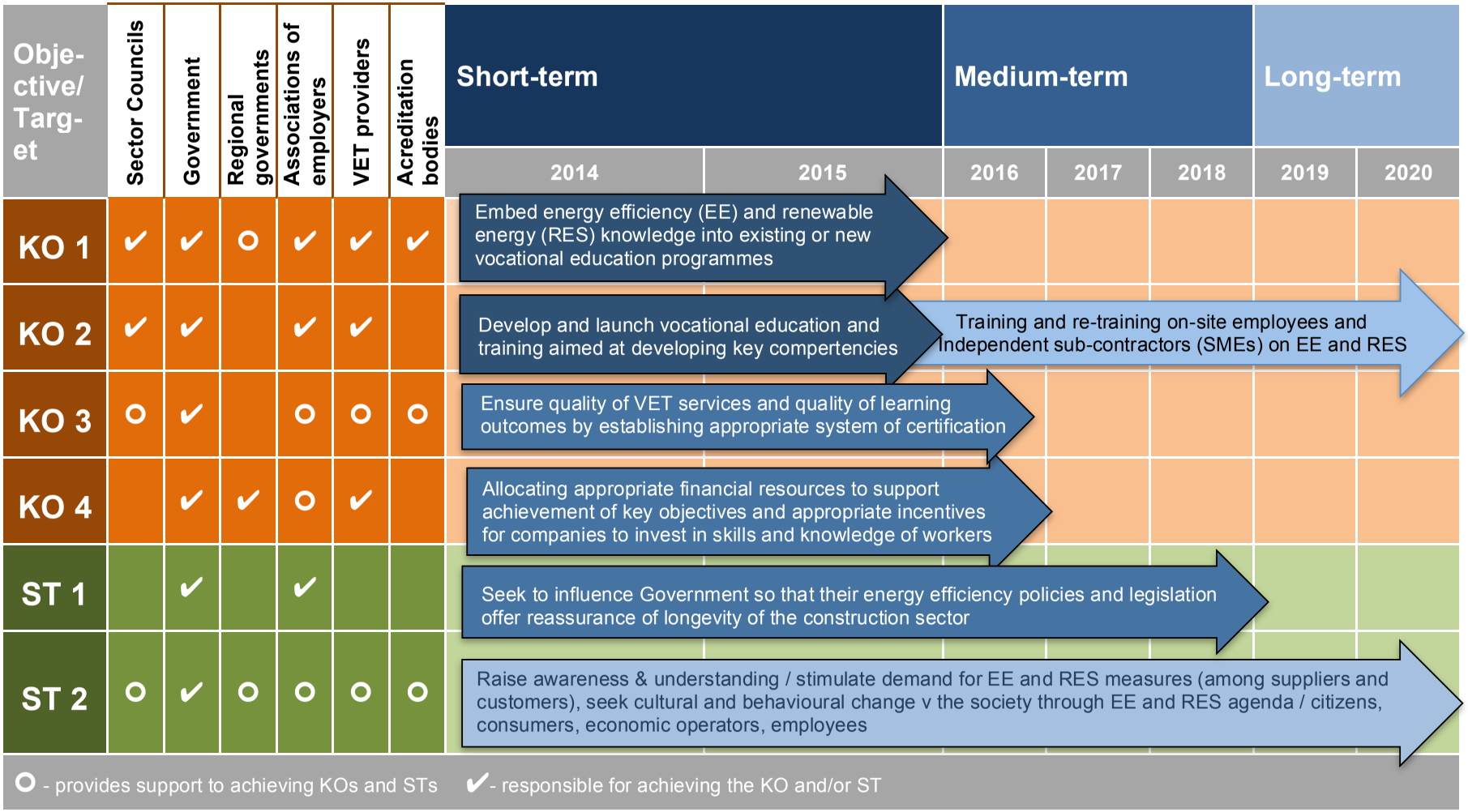
- Four key structural and operational objectives and two supporting objectives which represent the basis of the Roadmap, which is explained in more detail in the following chapter.
- Recommended time sequence, in which the defined objectives are to be achieved so as to meet the energy efficiency objectives by 2020 (the objectives are divided into short-term ones: 2014 – 2015, medium-term objectives: 2016 – 2018 and long-term objectives: 2019-2020).
- The main stakeholders who will be responsible for achievement of the objectives or who will play an important role in the achievement process.

It is necessary to mention that even if some objectives have to be fulfilled in a short-term or medium-term horizon; their validity will not cease to exist in the defined period as it will be necessary to further monitor the situation in the respective area.

Key objectives are divided into two groups:

1. **Key structural and operational objectives (KO).** The structural objectives will be fulfilled by measures focusing on systematic changes (new programmes, changes in the content of the existing programmes) and qualification and certification schemes. Operation objectives will focus on activities concerning vocational education and re-training of workers in the building sector.
2. **Supporting objectives (SO).** Supporting objectives will focus on supporting the need of new intelligent solutions and use of renewable energy sources (focusing on customers of the construction and energy sectors). These objectives will also focus on the total change in the population behaviour, without which it will not be realistic to achieve the 2020 energy objectives (and we have to reflect also on the current considerations to make them even stricter).

Table 4.3: **Key Objectives (KO) and Supporting Targets (ST) of the Roadmap on developing VET on EE and use of RES**



5. Measures to ensure the key and supporting objectives of VET in the construction sector with respect to the energy goals of EU 2020

5.1 Measures to meet the key objectives

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
1.1	**To ensure the mandate and the pilot phase of work of the Competence Centre for education in EE and use of RES in buildings (KCEB):** To define the mandate for KCEB. Transformation of NQP from the project Build Up Skills Pillar I into a network of stakeholders for vocational education focused on EE and use of RES in buildings.	The Competence Centre is a team of professionals and a network of specialised subjects active in VET, which, under the mandate and coordination of employers´ associations in the sector of buildings, develops methodological and educational/training materials in a form of specific projects supported from public resources (EU funds, state budget). The educational materials include mainly: educational programmes and learning units for incorporation of EE and use of RES in buildings, i.e. vocational education on all levels and all relevant professions, a network of trained trainers in order to ensure vocational education, support of innovation forms of education and rules for testing and certification of trained or retrained participants of education and training. Organisation which will be entrusted with management of KCEB under a defined mandate shall secure its functioning (according to the needs: statutes, structure, tasks, etc.). The National Qualification Platform (NQP) played an important role in development of the Status Quo Analysis (SQA) and this Roadmap. After finalisation of the Pillar I of the project Build Up Skills Slovakia, NQP will be transformed into a network of stakeholders in vocational education. This network will help to coordinate the policy of vocational education and training (VET). It will also help to identify resources for VET in the area of EE and use of RES in buildings. It is expected, that NQP will update the Roadmap and monitor the progress of its implementation.
1.2	**To finalise/develop national standards of occupations, qualification standards and complete the database of competences:**	Objective of this measure is to include into the Slovak existing register of competences, occupations and the newly developing register of qualifications new professions related to EE and RES and revise the existing ones so that they meet the requirements of 2020. The objective will be to include EE and RES into the databases of the register of competences

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
	To develop new or revise existing competence profiles, professional standards for the professions referred to in the paragraph 4.2.1 of the Roadmap with requirements to achieve energy targets of EU 2020. To incorporate outputs into the national system of occupations.	and afterwards also register of qualifications. The revision of the existing competence profiles will concentrate mainly on professions mentioned in the point 4.2.1. This list will be completed with findings from revision of the existing competence profiles. The outputs from this measure will be a complete register of competences in terms of EE and RES for construction and installers´ professions. This measure will be implemented in the framework of the National System of Occupations.
1.3	**To develop a programme of further professional development of employees and small traders in the sector of buildings:** To develop a programme for the increase of qualification and re-qualification of employees and small entrepreneurs in the construction sector.	The objective of this measure is to develop a detailed plan and allocate funds in order to secure the vocational education and training in terms of the measure 1.5.
1.4	**To develop teaching and methodological materials for incorporation of smart energy solutions into VET:** To elaborate teaching units and modules of VET curricula in order to incorporate the intelligent energy solutions built on EE and use of RES into the VET training. To ensure training of the trainers in the area of EE and use of RES in buildings.	The objective of this measure is to develop teaching and methodological materials for incorporation of smart energy solutions based upon EE and use of RES into vocational education and training in the construction sector. These materials include, in particular: • Teaching units for incorporation into programmes of vocational education for professions mentioned under the point 4.2.1, • Modules of curricula for incorporation of EE and RES into programmes of vocational education and training, • Trained trainers and their database for use in provision of vocational education and training focused on EE and use of RES, • Database of recommended teaching tools for vocational education and training, • Draft content of text books and use of IT in VET (e.g. electronic textbooks, software simulators).

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
1.5	**To develop cross-study programmes:** To develop cross-study programmes - 4-year with graduation (in cooperation with regional competence centres) for construction and technical systems professions.	Complexity of technological processes and equipment requires that the specialists at secondary and higher levels should have transversal knowledge and skills - the area of energy facilities interferes into the field of constructions and buildings, as well as into the field of electrical technology and energetics. These study programmes will include internships in enterprises in Slovakia as well as abroad through cooperation between the secondary vocational schools and employers in order to obtain practical experience in the given study programme, as well as ensure possibility to sign an employment contract between the graduate and company at the market. It is assumed that 4 study programmes will be established and the existing ones will be supported and developed**.**
1.6	**To develop a programme for increase of qualifications and re-qualifications:** To develop programs for increase of qualifications and re-qualification of workers and small traders in construction sector and provide professional education according to the needs of employers and contractors in construction industry**.**	In light of the results of the Status Quo Analysis (SQA), it is necessary to provide retraining and further training to 47,000 employees and small business owners concerning EE and use of RES in the years 2014-2020. In order to ensure this volume of vocational education and training, it is necessary to implement programmes of vocational education and practical education using pedagogical materials developed by KCEB (see measure 1.3). The practical education will be done in the centre (centres) for practical education, the theoretical part of education will be provided by subcontractors providing educational/training services under professional and methodological supervision of KCEB.
1.7	**To monitor the level of competence (professional skills and knowledge, general competences) of the workforce in the building sector:** Monitoring in order to identify and propose necessary additional measures to ensure human resources to meet the	It is expected that NQP, transformed into a network of VET stakeholders, will update the Roadmap annually and will monitor the progress in its implementation.

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
	energy objectives of 2020.	
1.8	**To increase the transparency of the labour market and skills requirements of employers:** To ensure a system of collection of information about qualification needs and specific requirements of the labour market by individual professions.	Right at the beginning, it is necessary to develop for the needs of the correct definition of VET in the sector of buildings, a system of regular elaboration of overviews of qualification needs and the situation at the labour market, together with a mid-term view. This measure is closely related with the measure 1.2.
1.9	**To ensure training and certification in accordance with the Article 14(3) of the Directive 2009/28/EC:** To ensure training and certification in accordance with the Article 14(3) of the Directive 2009/28/EC for installers of small boilers and furnaces on biomass, solar photovoltaic and solar thermal systems, shallow geothermal systems, as well as heat pumps.	Installers of boilers and stoves burning biomass: The minimum range of the practical education includes practical education and training in assembling of heating and thermal technique, cutting of pipes and leak testing. The theoretical part of vocational education includes: a) Energetic use of the biomass, b) description of the biomass market, its transportation and storage, c) burning of biomass, products of burning, emissions and protection of environment, d) proposals, installation and maintenance of boilers and stoves on biomass, e) hydraulic circuit, f) measurement and management, g) fire protection, h) economy of operations, investment costs, operational costs, payback period of the investment, i) possibility to get grants or other forms of support, j) technical regulations in the field of biomass, boilers and stoves on biomass, k) generally binding legal regulations in the area of boilers and stoves on biomass, l) European Union legislation in the field of boilers and stoves on biomass. The minimum scope of the practical education includes practical education in assembling of heating and thermal technique, cutting of pipes and leak testing.

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
		The entry requirements include completion of: a) secondary vocational education in a technical field, b) complete secondary vocational education in a technical field, c) complete secondary vocational education with technical post-secondary studies, or d) university education in technical fields of study, and a practical experience in the given field for at least one year. Administrator of testing the professional competence is the Ministry of Economy SR. Professional training for the testing in the scope defined in the Annex 1 of the Decree No. 133/2012 Coll. administers the provider – legal person which got accreditation for the educational/training program according to the § 9 of the Act No. 568/2009 Coll. on lifelong learning and amending and supplementing certain acts in the scope of vocational education defined under § 19 paragraph 1 letter h) of the Act, and has technical equipment for practical education and training including relevant laboratory facilities.
1.10	**To ensure training and licencing in order to ensure restoration and construction of packaging structures securing the requirements according to the Directive 2010/31/EU:** To provide training and licencing in order to ensure the required properties of packaging structures (claddings including their insulation, the incorporation of opening structures, roof structures including waterproofing and thermal insulation systems).	Contractors of external insulations and roof insulations and build in opening and infill structures: The minimum practical part of the training involves practical training in the field of manufacturing of building structures, the incorporation of components and structures and their assembly. The theoretical part of vocational education includes: a) the requirements of technical standards for thermal characteristic of constructions and buildings, b) technological regulations and technical standards for the manufacturing of building structures and installation of components, c) a description of the characteristics of individual construction materials and construction structures, attesting the conformity of construction products (statement of constancy of parameters)

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
		d) principles of drawing and design of construction materials and construction **structures,** e) measuring methods of checking the conditions for the installation of construction materials and structures f) measuring methods for determining the quality of the built in construction products g) responsibilities of the participants in the construction. The minimum range of the practical vocational education includes practical education in the area of manufacturing of construction structures and incorporation of components and verification of features in order to prepare production and verification of produced construction structures. The details of the vocational education and training are not established by legislation.
1.11	**Introduction of the ECVET system:** The introduction of ECVET (European Credit Transfer System) in training courses focused on EE and use of RES in buildings and in general. This measure will be implemented together with the introduction of ECVET in vocational education in general**.**	ECVET is a new European instrument for increasing mutual trust between the institutions of vocational education and training. It was created by the EU Member States in cooperation with the European Commission and approved by the European Parliament and the EU Council in 2009 (2009 / C 155 / 02). Its aim is to recognise the learning outcomes that the learners reach during the international as well as national mobility. It contributes to the recognition of these results as an integral part of an individual's educational journey. At the same time, it makes it easier for the employers to understand the qualifications acquired abroad, as well as increases the credibility of education and training by identifying and documenting what a learner has achieved. In order to ensure the implementation of ECVET, it is necessary: • to develop units of learning outputs, • to elaborate methods and tools for testing the learning outcomes, • to make the practical testing in real conditions. ECVET could be used for: - simplification of internships in Slovakia and abroad, - clear definition of internship, - clear assessment and recognition of acquired educational results, - support of lifelong learning,

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
		- increase of professional and language skills of students. During implementation of this measure, cooperation with a professional team and ŠIOV needs to be implemented. ŠIOV is the designated contact point for implementation of ECVET in Slovakia.
1.12	**Allocation of necessary resources:** To allocate resources in order to secure measures focused on objectives defined in this Roadmap, and • make available the funds for vocational education, • support cooperation among companies, employers´ associations and providers of vocational education, • support investment in EE and use of RES. To ensure transparency in the use of funding sources and possibilities of using EU funds for education.	The buildings sector needs to make full use of financial resources designed to support vocational education and training. Therefore, the relevant government authorities will allocate the necessary resources for operational programs from the EU funds and maintain transparency of the opportunities for obtaining financial resources to implement the measures included in this Roadmap, as well as transparency of their allocation. In order to ensure access to necessary sources of financing from the decentralized EU funds, the relevant government authorities and the appropriate sub-programmes(s) will develop the relevant operational programs. These resources can be secured by negotiation with the European Commission to include vocational education concerning meeting the EU energy objectives till 2020 into the obligatory 20% allocation of structural funds for increase of energy efficiency and use of renewable energy sources.
1.13	**Dialogue of employers and government about financing of further vocational education:** To ensure continuous consultations between the government and employers´ associations regarding the prospects of vocational education funding in order to draw attention to the possibility to apply for funding for this purpose.	In order to increase awareness of employers about possibilities of financing the educational activities and supportive activities focused on increase of EE and use of RES in buildings, consultations between the state administration and employers will take place. The consultations shall consider other instruments promoting awareness about the possibilities of financing education, for example databases of financial instruments available for the building sector, instructional seminars and materials.

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
1.14	**To introduce motivational tools for investment in education:** To introduce motivational tools (tax, grants) for employers involved in cooperation with providers of vocational education and supporting forms of cooperation for vocational education and practical education.	Those employers who will be engaged in the promotion of vocational education (participation in projects, provision of internships and professional practice for young people, etc.) and in collaborative forms of vocational education (e.g. joint training centres at employers unions) will get advantages via tax and grant instruments.
1.15	**Use of funds from the sale of emission permits for VET in EE, and use of RES:** Under the current legislation, to ensure that funds from the sale of permits for CO2 emissions are provided for measure of EE and use of RES, including vocational education**.**	Under the current legislation, the Ministry of Finance SR and the Ministry of Environment SR shall annually determine by a decree the ways of use of funds from the sale of emissions. Under EU Directive 2009/28/EC, for the purpose of increase the use of RES and EE should be allocated at least 50% of funds raised from the sale of permissions for CO2 emissions. This creates space for supporting the demand of increase EE of buildings and the use of renewable energy sources in the energy mix of buildings, as well as space for support of education and training focused on EE and use of RES in buildings.
1.16	**To secure financial resources, support mechanisms and other tools for renovation of buildings.**	To secure financial resources, support mechanisms and other tools so that the renovation of housing units, effective and early transition to construction of “near zero energy buildings”, renovation of public buildings in the rate of 3 % of the total floor area and use of RES in order to reach the national objective, should be accelerated. The current pace of reconstruction of residential buildings, due to lack of proper statistical surveys, is being made by a qualified estimate on the basis of the consumption of insulating materials, respectively anchors for about 30,000 housing units per year. It represents mainly the insulation, what is only a partial recovery. The platform "Future for the buildings" agreed on the need to increase the pace of reconstruction of residential buildings, especially with regard to the technical conditions of buildings and the natural cycle of their renovation (40 years for building parts). Significant

Measure nr.	Measure, its scope and objectives	Brief description of the measure, associated measures
		improvement in energy efficiency is not only concomitant of the recovery, but also part of the solution of some systemic shortcomings, e.g. prefabricated houses (shifting of the dew point outside the building construction stops the corrosion processes damaging steel panel joints). The target recovery rate is defined from two perspectives. In terms of the current capacity of the sector and also with the assumption of decline about 20% of the current building stock (due to obsolescence), the participants of the final workshop concerning development of the Roadmap discussed the need to renovate 40,000 housing units per year. Taking into account the natural cycle of renovation and maximum efforts to prevent disrepair of buildings within the next 20 years and the related problem of social housing (whose costs are substantially higher than the costs of early recovery) and according to the platform "Future for the buildings" the need for renovation of residential buildings increased up to 57,000 housing units per year. Although there is still discussion among the professional community about the required rate of renovation of residential buildings, there exist the agreement that the rate has to be accelerated. This will be linked with the need of professional capacities and skills.

5.2 Measures to meet the supportive objectives

Measure nr.	Measure, scope, objectives	Brief description of the measure, associated measure
2.1	**To create working and advisory groups for the government about EE and use of RES in buildings:** To create working and advisory groups for the SR Government for increasing energy performance of buildings and use of renewable energy sources in the energy mix of buildings.	The questions of energy efficiency and use of renewable energy sources are addressed by several ministries. In order to improve the coordination and cooperation with stakeholders (employers, investors, owners of buildings, educational institutions) it is necessary to improve communication and cooperation in development of measures in the area of legislation, government policies and funding of activities focused on improvement of energy efficiency and use of renewable energy sources. Two working groups will be established, members of which will be representatives of the relevant state bodies and companies. They will meet twice a year and will develop recommendations for the government in the area of use of RES and energy efficiency.
2.2	**To create the national strategy for education in energetics.**	Creation of a national strategy for education in energetics focused in particular on prospective areas and increase of awareness during the lifelong learning in energetics, involvement of key areas of energetics in all levels of education. The focus should be in particular on RES and energy efficiency, smart measuring systems and low-carbon technologies.
2.3	**To ensure the economic impact assessment of new legislation in the sector of buildings:** Incorporate into the legislative process the economic assessment of the new legislation /the amended legislation for vocational education in terms of economic impact on companies in the construction sector.	When drafting new legislation and amending the existing one focused on vocational education or legislation which interferes with the vocational education in the construction sector, it is necessary to assess its impact upon economic subjects active in the construction sector and adopt measures for elimination of economic risks. The results of the assessments will be part of a material submitted to the government in respect of the draft legislation or the material submitted by the government to the Parliament for possible changes in the draft legislation.
2.4	**To monitor implementation of the Roadmap:**	Regular annual evaluation of fulfilment of the objectives of the Roadmap will help to take corrective actions in case of any problems in implementation of measures or failure to

Measure nr.	Measure, scope, objectives	Brief description of the measure, associated measure
	To regularly evaluate fulfilment of objectives defined in this Roadmap.	achieve the expected objectives. This regular evaluation will provide feedback to the state administration about development of conditions to achieve energy targets 2020.
2.5	**To increase awareness of the general public about EE and use of RES:** To increase awareness of customers about increase of EE and use of RES in order to stimulate demand for smart energy solutions.	The customer´s awareness will be increased by: • information activities and workshops, • national campaign using general and specialised media, • publications in professional journals focused on residential and non-residential premises, • campaigns through the social media like Twitter and Facebook. Information activities and workshops will include: • general information about the climate changes, the need to reduce the "carbon" burden and support "the green economy", • increase of awareness on smart energy solutions aimed at increase of EE and use of RES, • motivation tools for increase of EE and use of RES in residential and non-residential buildings/premises, • economic impact of increase of fuel and energy prices on the households and companies budgets and possibilities for savings through increase of EE and use of RES, • consumer protection and safe operation of smart energy solutions. It is necessary to implement this measure under the auspices of the SR Government and in cooperation with the employers´ associations which will provide professional content of the activities. For this purpose, modular tools to be used during information activities and workshops will be developed.
2.6	**To increase awareness about EE and use of RES among the employers in the sector of buildings:** To increase awareness of employers in	The employers' associations will be catalysts for raising awareness among their members and facilitators of presentation opportunities in vocational education aimed at increasing EE and use of RES in the energy mix of buildings. This measure will be implemented by workshops, seminars as well as information

Measure nr.	Measure, scope, objectives	Brief description of the measure, associated measure
	the construction sector about the agenda of increase of EE and use of RES, including the EU energy objectives for 2020 and about possibilities of increasing qualifications, improving skills and knowledge for employers and sub-contractors.	campaigns and information days during professional activities (e.g. CONECO) aimed at: • "best practice" in increase of EE and use of RES in energy mix of buildings, • vocational education and training opportunities and their co-financing. Possibilities for cooperation in vocational education of employees and sub-contractors.
2.7	**To amend the conditions of the public procurement:** To amend conditions of public procurement to the needs of increasing EE of buildings and use of RES in the energy mix in buildings**.**	The commitment to ensure high EE and use of OZE in the energy mix of buildings begins already at the public procurement and demonstration of preparedness of human resources to be able to implement the subject of the public procurement. Therefore it is logical, that the requirements for EE of buildings, use of RES and investment into the vocational education and training of human resources in order to ensure the subject of the public procurement, should be part of the tender conditions.
2.8	**Information portal about EE and use of RES in buildings:** To create and operate a portal providing professional information about EE of buildings and use of RES to the general public.	The professional associations in the construction industry will create and operate through sub-contractors a portal and will develop its content and provide professional assistance and profound answers to questions. The content shall be divided by the target groups: - Hints and tips; - Technical part including legislation; - Hints for immediate savings; - Calculators for various calculations; - Frequently asked questions; - Recent trends in the construction industry; - Latest technology used; - References of construction companies; - Qualitative requirements; - Consumer protection – how to fight with poor quality; - Blogs.

Measure nr.	Measure, scope, objectives	Brief description of the measure, associated measure
2.9	**To create a strategy for development of education in the area of energy efficiency and RES.**	To ensure adaptation of the educational process to the current trends and requirements in the energetics.
2.10	**To prepare a new roadmap for achieving the objectives of the EU Energy Roadmap till 2050.**	Requirements for competences (professional skills, professional knowledge and general competences) and qualifications will be further changed and developed in the view of the EU Energy Roadmap. Therefore this BUSSK Roadmap must, in addition to the mentioned interim update, revise and adjust the measures and the action plan to the objectives that should be reached in 2050. This revision should be done at least 2 years before the end of the planned period of this Roadmap.

6. Action plan to ensure implementation of measures

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
1.1	To ensure the mandate and the pilot phase of work of the Competence Centre for education in EE and use of RES in buildings (KCEB)	To ensure functioning of the system of continuing vocational education and training and necessary know-how through European cooperation	Mandate till June 30th 2014. Pilot phase of 3 years	ZSPS	MH SR, MŠVVŠ SR, MDVRR SR, SIEA, ÚVS	€480 000	ESF/ERDF (will be defined after elaboration of the mandate)
1.2	To finalise/develop national standards of occupations, qualification standards and complete the database of competences	Incorporate relevant competences regarding EE and use of RES into the National	2014-2015	MPSVR SR, MŠVVŠ SR	Sectoral Councils for the construction and energy sectors	€300 000[15]	ESF (Financed from the budged for NSP)

[12] The measure is explained into more details in the part 5.

[13] Guarantor/coordinator is an organisation which initiates and coordinates implementation of the measure in cooperation with cooperating organisations and other relevant subjects. In case, that the guarantor decides to transfer its role to another organisation due to a possible conflict of interests, this has to be done on the basis of an agreement with cooperating organisations.

[14] The given estimated costs represent the minimum financial resources for implementation of the given measure in order to reach the key and supporting objectives.

[15] NSP has its budget and relevant projects – out of those resources should be financed the update of the relevant databases.

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
		System of Occupations					
1.3	To develop a programme for further education of employees and small traders in the sector of buildings	Define into details requirements for further education	December 31st 2014	MŠVVŠ SR	ZSPS MDVRR SR, MH SR, ÚVS	€120 000[16]	ESF
	National project Further education and counselling for adults as a tool for their better employment at the labour market (professions in construction - bricklayer , floor layer, plumber, carpenter, electrical engineering professions - fitter of equipment in the RES)		2013 - 2015	National Institute for Lifelong Learning	ZSPS	(27 993 607,83 EUR, funds already allocated for the whole project)	The project is co-financed from ESF
1.4	To develop teaching and methodological materials for incorporation of smart energy solutions into VET	To incorporate smart energy solutions into vocational education in the	2014-2015	KCEB	MH SR, SIEA, MŠVVŠ SR, MDVRR SR, ÚVS, TSÚS, employers,	€800 000[17]	CIP IEE Pillar 2, "Skills Alliances"

[16] Labour costs of participating organisations and subcontracting of of background materials and calculations.
[17] The calculation is based upon the content (explained into more details in part 5) and the average estimated amount of the grant for „Skills Alliances".

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
		sector of buildings			VET providers		
1.5	To develop cross-study programmes	To support cross-professional skills and knowledge and the development of cross professions in order to improve the quality of work	2014-2016	MŠVVŠ SR	ZSPS, employers, MH SR, MDVRR SR	€1 200 000[18]	ESF, Erasmus for All, "Skills Alliances"
1.6	To develop a programme for increase of qualifications and re-qualifications	To develop competencies (skills, knowledge, professional competences) relevant for EE and use of RES in buildings for 47000 persons	2014-2020	KCEB	MŠVVŠ SR, VET providers, MDVRR SR, MH SR, SIEA, TSÚS, ÚVS, regional competence centres, employers	€23 500 000[19]	ESF (20 % allocation from Structural Funds for measures of EE and use of RES)
1.7	To monitor the level of competence (professional skills and knowledge, general competences) of the	To apply corrective strategies, as needed	2014-2019	Sectoral Council for the construction sector	MPSVR SR, MH SR, MDVRR SR	€60 000[20]	ESF and state budget (within the funds allocated for activities of the

[18] Calculation was done assuming creation of 4 cross-study vocational programmes.
[19] At 47,000 trained and/or re-trained persons, the average costs €500/person.
[20] The Sectoral Councils have their own budget. The above mentioned estimations are the assumed additional costs for assessment of data collected in the framework of the employment policy and the labour market.

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
	labour force in the building sector						Sectoral Councils)
1.8	To increase the transparency of the labour market and skills requirements of employers	Adoption of preventive measures to reduce the discrepancy of supply and demand at the labour market, the early warning system of the risks of pressure on certain professions,	2014-2015	MPSVR SR	MŠVVŠ SR a vertical resorts	Shall be specified together with the budget for improvement of the labour market transparency	ESF and the state budget (within the funds allocated for monitoring of the labour market)
1.9	To ensure training and certification in accordance with the Article 14(3) of the Directive 2009/28/EC for installers of small boilers and furnaces on biomass, solar photovoltaic and solar thermal systems, shallow	To ensure quality of work performance and compliance with the requirements for professional skills and knowledge	December 31st 2014	MH SR, SIEA	MŠVVŠ SR, MDVRR SR	€120 000[21] start-up costs	State budget

[21] Calculation of costs for start-up of the training and licencing. Other costs should be covered by charges. Please note, that the costs for execution of obligations resulting from the law cannot be subsidized from the EU funds for support of education.

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
	geothermal systems, as well as heat pumps.						
1.10	To ensure training and licencing in order to ensure restoration and construction of packaging structures securing the requirements according to the Directive 2010/31/EU:	To ensure quality of work performance and compliance with the requirements for professional skills and knowledge	December 31st 2014	MDVRR SR, or organisation designated by them	MŠVVŠ SR,	€120 000[22] start-up costs	State budget
1.11	Introduction of the ECVET system	To increase the quality of learning outcomes, confidence in vocational education and training, to ensure comparability and mutual recognition of professional education .	2014-2016	ZSPS	MŠVVŠ SR, MDVRR SR, MH SR, ÚVS	€800 000[23]	EU programme "Erasmus for All" sub-programme "Skills Alliances"
1.12	To allocate the	Implementation of	2014-	MŠVVŠ SR	ZSPS, KCEB	Shall be	Each

[22] Calculation of costs for start-up of the training and licencing. Other costs should be covered by charges. Please note, that the costs for execution of obligations resulting from the law cannot be subsidized from the EU funds for support of education.
[23] The estimated costs are based upon comparable costs in the manufacturing sector and on the average expected amount of the grant for „Skills Alliances"

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
	necessary resources within the relevant operational programs under the EU Structural Funds	measures included in the Roadmap	2020	or resorts responsible for the individual operational programmes.		specified in cooperation with resorts responsible for the individual Operational Programmes	participating subject shall finance its costs from its own budget[24]
1.13	Dialogue of employers and government about financing of further vocational education	To ensure development of the sector of buildings	2013-2020	ZSPS	MDVRR SR, MŠVVŠ SR, MH SR	Shall be specified by the participating subjects	Each participating subject shall finance its costs from its own budget
1.14	To introduce motivational tools for investment in education	To motivate employers to invest in development of skills and knowledge of workers on construction sites	2014-2015	MŠVVŠ SR	MPSVR SR, MF SR, MH SR, MŽP SR, MDVRR SR ZSPS	Shall be calculated after specification of motivational tools	Resources will depend upon the type of the motivational tool
1.15	Use of funds from the sale of emissions for VET about EE and use	To allocate funds for VET	From 2014	MŽP SR[25]	MF SR	Shall be calculated after completion of negotiations	Funds from the sale of emission permits

[24] They are administrative costs related to negotiations and preparation of background materials for individual Operational Programmes. Costs of the supported projects are calculated in each individual measure.
[25] In line with the amendment of the Act on Environmental fund.

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
	of RES					about the future of ETS	
1.16	To secure financial resources, support mechanisms and other tools for renovation of buildings	To stimulate demand for smart energy solutions, to ensure the restoration of buildings in terms of their life cycle	from 2014	MDVRR SR through ŠFRB and JESSICA (apartment houses) MŽP SR and MH SR (public buildings) MPRV SR through IROP (public buildings under the responsibilities of the local and regional self-government, construction of rental flats)	MF SR, MŠVVŠ SR, MV SR, ZSPS	Will be calculated after specification of tools and scope of the annual restoration	The resources will depend upon the type of the tools
2.1	To create working and advisory groups for the government about EE and use of RES in	To improve communication between participating subjects and	December 31st 2013	MDVRR SR, MH SR	ZSPS, SIEA	Will be specified by the participating subjects	Each participating subject shall finance its costs from its own

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
	buildings	improvement of adopted measures					budget
2.2	To create the national strategy for education in energetics	To ensure development of VET in the given area for the needs of the EU objectives in the area of energetics in 2020	2014	MH SR, SIEA	MŠVVŠ SR, MDVRR SR and other relevant resorts	Will be specified by the participating subjects	Will be specified by the participating subjects
2.3	To ensure the economic impact assessment of new legislation in the sector of buildings	To implement principles of "intelligent legislation"	Since 2013	The relevant resort	MDVRR SR and other relevant resorts	Will be specified within the development of the legislative process[26]	State budget for the area of formation of legislative measures
2.4	To monitor implementation of the Roadmap	To ensure control of fulfilment of measures and proposal of corrective measures, if necessary.	From 2014	KCEB	MH SR, MDVRR SR, MŠVVŠ SR, SIEA	Will be specified by the participating subjects	Each participating subject shall finance its costs from its own budget
2.5	To increase awareness of the general public about EE and use of RES.	To change the behaviour of the public in terms of EE and use of RES in buildings	2015-2019	MH SR/SIEA	MŽP SR, MDVRR SR, ZSPS, ÚVS	€3 000 000	Horizon 2020, ERDF and income from sale of the emission permits

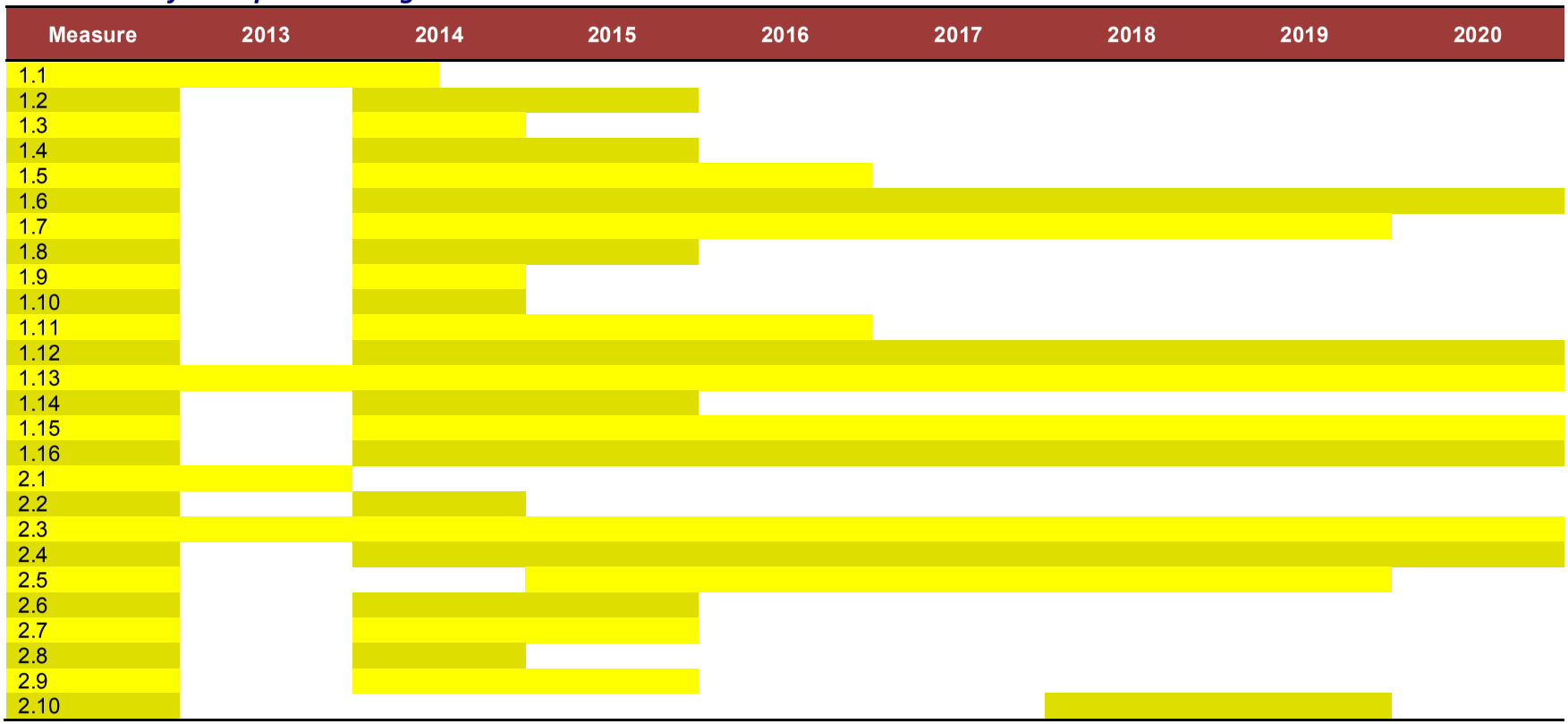
[26] Costs of the impact assessment must be assessed individually according to the range of the new requirements and changes in the legislation.

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs[14]	Funding source
2.6	To increase awareness about EE and use of RES among the employers in the sector of buildings	To increase investment in professional skills and knowledge of workers at the construction sites.	2014-2015	KCEB	MH SR, MDVRR SR, MŽP SR, ÚVS, SIEA	€ 2 400 000	Horizon 2020, ERDF and income from sale of the emission permits
2.7	To amend the conditions of the public procurement to the requirements of EE and use of RES in buildings	To ensure achievement of the minimum quality requirements in terms of EE and use of RES in buildings, as well as the costs of the building in terms of its life cycle	2014-2015	MV SR, ÚVO	MDVRR SR, MF SR, MH SR	Will be specified by the participating subjects	State budget for the area of formation of legislative measures
2.8	Information portal about EE and use of RES in buildings	To improve awareness about smart energy solutions and their benefits	2014	SIEA	ZSPS, MH SR, MDVRR SR	Will be specified by the participating subjects	ERDF
2.9	To create a strategy for development of education in the area of energy efficiency and RES	To ensure amendment of the educational process to the current trends and requirements in energetics	2014-2015	MŠVVŠ SR	MH SR, SIEA	Will be specified by the participating subjects	Horizon 2020

Measure nr.	Measure[12]	Objective	Term	Guarantor/coordinator[13]	Cooperating organisations	Envisaged minimum financial costs [14]	Funding source
2.10	To prepare a new roadmap for achieving the objectives of the EU Energy Roadmap till 2050	To ensure formulation of measures for reaching the objectives of the EU Energy Roadmap till 2050	2018-2019	MH SR	ZSPS, MDVRR SR	€250 000	Horizon 2020[27]

[27] Could be ensured by promoting a project on EU level.

Timetable for implementing the measures:



Recap of minimum financial costs to ensure the implementation of measures by source of funding (other expenses will be solved within the current budgets of the participating entities)

Measure	ESF/ERDF In thous. €	CIP In thous. €	Erasmus for All In thous. €	Horizon 2020 In thous. €	State budget[28] In thous. €	TOTAL In thous. €
1.1	480					480
1.2	300					300
1.3	120					120
1.4		800				800
1.5	400		800			1 200
1.6	23 500					23 500
1.7					60	60
1.8						
1.9					120	120
1.10					120	120
1.11			800			800
1.12						
1.13						
1.14						
1.15						
1.16						
2.1						
2.2						
2.3						
2.4						
2.5				3 000		3 000
2.6				2 400		2 400
2.7						
2.8						
2.9						
2.10				250		250
SPOLU	24 800	800	1 600	5 650	300	33 150

28 The funds from the state budget will be specified after the standpoint of the Ministry of Finance

7. Conclusions

The Roadmap on developing VET on energy efficiency and use of renewable energy sources in buildings presents the framework for cooperation of all stakeholders aimed at continuous improvement of vocational education and training of craftsmen and on-site workers in the building sector and at proactively responding to the challenges of "the green economy" by 2020, especially in terms of EE and use of RES.

The proposed solution responds to the weaknesses identified by analysing the current situation in the sector and this Roadmap and the Strategy of the government based on it needs to be implemented for achieving the key objectives identified. The procedure and timetable for the implementation of various measures, including the distribution of responsibilities among the stakeholders together with proposal of their financing is described in the Action Plan.

The framework will create conditions for successful adaptation of the vocational education and training of workers in the building sector, mainly for workers at the construction sites, to the requirements of 2020 agenda. At the same time, the coordinated implementation of the measures and response to the market and trends in the construction industry will increase the competitiveness of the Slovak construction sector beyond 2020.

The core of the proposed system is the establishment of a Competence Centre and its regional network, ensuring networking of the vocational education institutions and stakeholders in order to implement coordinated management of the education tasks in the construction industry. This will create the conditions for adequate structuring and alignment within the entire system.

The proposed system of measures introduces a complex approach to the following issues in the construction sector, energy performance of buildings and renewable energy sources in buildings:

- Employment and transparency of the labour market,
- System of cross-trade horizontal qualifications,
- Preparation and development of cross-trade education and training programmes,
- Accreditation of training and certification of successful trainees,
- Creation of an institutional framework to ensure continuous dialogue of stakeholders, monitoring of the labour market, the education system, accreditation of education, its financing, as well as new trends and requirements in this area,
- A coordinated approach to funding of all these activities to effectively align all available financial flows, in particular sources from EU funds and initiatives,

funds from the state budget of the Slovak Republic and relevant private sources.

8. Endorsement statements from the relevant ministries of the government

3501/a

MINISTERSTVO ŠKOLSTVA,
VEDY, VÝSKUMU A ŠPORTU
SLOVENSKEJ REPUBLIKY
štátny tajomník
Štefan Chudoba

Bratislava 31. októbra 2013
Číslo: 2013-18265/50300:1-03
Trieda dôvernosti: „verejné“

Vážený pán Lukáč,

dňa 10. októbra 2013 ste nám predložili žiadosť o podporu MŠVVaŠ SR pre záverečné výstupy projektu Build Up Skills Slovensko. Nakoľko cieľom projektu je aj príprava podkladov pre národnú Stratégiu vytvorenia a zavedenia komplexného systému ďalšieho vzdelávania v sektore budov a tým aj snaha o zvýšenie kvalifikačnej úrovne pracovného potenciálu v oblasti stavebníctva, týmto vyjadrujeme plnú podporu implementácii projektu koordinovaného Zväzom stavebných podnikateľov Slovenska.

Dovoľujem si Vám oznámiť, že základné kvalifikačné predpoklady vybraných profesií v oblasti stavebníctva budú riešené prostredníctvom projektu Národná sústava kvalifikácií (realizátorom projektu je Štátny inštitút odborného vzdelávania), kde by bolo vhodné zadefinovať nároky na vedomosti, zručnosti a kompetencie daných kvalifikácií smerom k energetickej hospodárnosti, energetickej efektívnosti a využívania obnoviteľných zdrojov energie pri výstavbe do kvalifikačných a hodnotiacich štandardov. Práve tieto kvalifikačné štandardy majú slúžiť ako základ na vytvorenie programov vzdelávania vo formálnom systéme vzdelávania, ale aj v systéme neformálneho, či ďalšieho vzdelávania odborníkov. Súlad Stratégie systému ďalšieho vzdelávania v oblasti stavebníctva s kritériami zaradenia kvalifikácií do jednotlivých úrovní Národného kvalifikačného rámca Slovenskej republiky nám napomôže k zvýšeniu konkurencieschopnosti a ďalšieho rozvoja slovenského stavebníctva nielen v domácich podmienkach, ale aj v kontexte európskeho priestoru.

S úctou

Vážený pán
Ing. Zsolt Lukáč
prezident
Zväz stavebných podnikateľov Slovenska
Viedenská cesta 5
851 01 Bratislava

MINISTRY OF EDUCATION,
SCIENCE, RESEARCH AND SPORT
OF THE SLOVAK REPUBLIC
State Secretary
Štefan Chudoba

Bratislava, 22 October 2013
Ref. no.: 2013-18265/50300:1-03
Confidentiality class: "public"

Dear Mr Lukáč,

On 10 October 2013 we received your application for the support of MESRS SR for the final outcomes of the Build Up Skills Slovakia Project. As the aim of the project also concerns preparation of documents for the national Strategy of establishment and introduction of a comprehensive further education system in the building sector, and thus also an effort to enhance the qualification level of the labour potential in the construction sector, we hereby express our full support for the project implementation coordinated by the Association of Construction Entrepreneurs of Slovakia.

Let me announce to you that the basic qualification preconditions of selected professions in the construction sector will be dealt with in the National Qualifications Framework Project (implemented by the State Vocational Education Institute), where it would be suitable to define the requirements on knowledge, skills and competencies of the respective qualifications as regards energy performance, energy efficiency and use of renewable energy sources in construction sector to be incorporated into the qualification and evaluation standards. These standards are to serve as a basis for preparation of programmes within the formal education system as well as the informal system or further education and training of experts. Harmonising the Strategy of the further education system in the construction sector with the criteria of qualifications classification into individual levels of the National Qualifications Framework of the Slovak Republic will help us to increase competitiveness and further development of Slovak construction industry not only under national conditions but within the European context as well.

Yours sincerely,

[signature in hand]

Mr
Ing. Zsolt Lukáč
President
Association of Construction Entrepreneurs of Slovakia
Viedenská cesta 5
851 01 Bratislava

MINISTERSTVO HOSPODÁRSTVA SLOVENSKEJ REPUBLIKY
Mierová 19, 827 15 Bratislava

374/2013

Vážený pán
Zsolt Lukáč
prezident
Zväz stavebných podnikateľov
Slovenska
Sabinovská 14
82102 Bratislava

Váš list značky	zo dňa	naša značka	vybavuje/tel.	Bratislava
40/2013	14.10.2013	4554/ 2013-4100	Ing. Korytárová, kl.1941	18. 10. 2013

VEC: Vyhlásenie o podpore

Vážený pán prezident,

Ministerstvo hospodárstva Slovenskej republiky má v zmysle zákona č. 575/2001 Z. z. o organizácii činnosti vlády a organizácií ústrednej štátnej správy v znení neskorších predpisov vo svojej kompetencii oblasť energetickej efektívnosti. V tejto súvislosti MH SR vyjadruje svoju plnú podporu implementácii Stratégie vytvorenia a zavedenia **komplexného systému ďalšieho vzdelávania v sektore budov**, výstupu realizácie projektu „Získavanie odborných zručnosti na Slovensku" – **BUILD UP SKILLS SLOVAKIA** (skrátene BUSS). Projekt je financovaný v rámci iniciatívy programu Inteligentná energia Európa II „Národné platformy vzdelávania a dlhodobých vízií do roku 2020" (identifikátor výzvy: CIP-IEE-2011) a koordinovaný Zväzom stavebných podnikateľov Slovenska (ZSPS).

S pozdravom

Ing. Ján Petrovič
generálny riaditeľ sekcie energetiky

TELEFÓN ÚSTREDŇA - 4854 1915 FAX podateľňa 4854 3914

MINISTRY OF ECONOMY OF THE SLOVAK REPUBLIC
Mierová 19, 827 15 Bratislava

Mr
Ing. Zsolt Lukáč
President
Association of Construction
Entrepreneurs of Slovakia
Sabinovská 14
82102 Bratislava

Your ref. no.	Date	Our ref. no.	Responsible	Bratislava
40/2013	14/10/2013	4554/ 2013-4100	Ing. Korytárová, tel. extension 1941	18 October 2013

SUBJECT MATTER: Declaration of support

Dear Mr President,

In terms of Act no. 575/2001 Coll. on organisation of activities of the government and central state administration bodies as amended, the Ministry of Economy is responsible for the energy efficiency area. In this respect, ME SR expresses its full support for implementation of the **Strategy of establishment and introduction of the comprehensive further education system in the building sector**, the outcome of the **BUILD UP SKILLS SLOVAKIA Project** (BUSSK). The Project is financed under the initiative of the Intelligent Energy Europe II Programme "National qualification platforms and roadmaps to 2020" (call identifier: CIP-IEE-2011) and coordinated by the Association of Construction Entrepreneurs of Slovakia (ZSPS).

Yours faithfully,

[signature in hand]

Ing. Ján Petrovič
Director General of Energy Section

354/11

MINISTERSTVO DOPRAVY, VÝSTAVBY A REGIONÁLNEHO ROZVOJA SLOVENSKEJ REPUBLIKY
810 05 BRATISLAVA 15, Námestie slobody 6, P. O. Box 100
SEKCIA VÝSTAVBY - ODBOR STAVEBNÍCTVA

Vážený pán
Ing. Zsolt Lukáč
prezident

Zväz stavebných podnikateľov Slovenská
Viedenská cesta 5
851 01 Bratislava

Bratislava 21. októbra 2013
Číslo: 08814/2013/B610-SV-64773

VYHLÁSENIE O PODPORE

Týmto vyjadrujeme plnú podporu implementácií **Stratégie vytvorenia a zavedenia komplexného systému ďalšieho vzdelávania v sektore budov**, výstupu realizácie projektu „Získavanie odborných zručnosti na Slovensku" – **BUILD UP SKILLS SLOVAKIA** (skrátene BUSSK), pod iniciatívou programu Inteligentná energia Európa II. „Národné platformy vzdelávania dlhodobých vízií do roku 2020", koordinátorom ktorého je Zväz stavebných podnikateľov Slovenska.

Ing. Alena Ohradzanská
riaditeľka odboru stavebníctva

MINISTRY OF TRANSPORT, CONSTRUCTION AND REGIONAL DEVELOPMENT OF THE SLOVAK REPUBLIC
810 05 BRATISLAVA 15, Námestie slobody 6, P. O. Box 100
CONSTRUCTION SECTION – BUILDING DEPARTMENT

Mr
Ing. Zsolt Lukáč
President

Association of Construction
Entrepreneurs of Slovakia
Viedenská cesta 5
851 05 Bratislava

Bratislava, 21 October 2013
Ref. no.: 08814/2013/B610-SV-64773

DECLARATION OF SUPPORT

We hereby express full support for implementation of the **Strategy of establishment and introduction of the comprehensive further education system in the buildings sector** as the outcome of the **BUILD UP SKILLS SLOVAKIA Project** (BUSSK) under the initiative of the Intelligent Energy Europe II Programme, "National qualification platforms and roadmaps to 2020", coordinated by the Association of Construction Entrepreneurs of Slovakia.

[signature in hand]
Ing. Alena Ohradzanská
Building Department Director

9. Authors/contributors

Project coordinator:

Attila Jámbor
Association of Construction Entrepreneurs of Slovakia

Text and data collection

Zsolt Lukáč, Association of Construction Entrepreneurs of Slovakia
Lucia Perucconi Boháčová, Association of Construction Entrepreneurs of Slovakia
Zuzana Sternová, Building Testing and Research Institute, n.o.
Peter Briatka, Building Testing and Research Institute, n.o.
Daniela Kahalová, Building Testing and Research Institute, n.o.
Roman Horečný, Building Testing and Research Institute, n.o.
Jana Bendžalová, Building Testing and Research Institute, n.o.
Ján Magyar, Slovak Innovation and Energy Agency
Eduard Jambor, Slovak Innovation and Energy Agency
Andrej Slančík, Slovak Innovation and Energy Agency
Renata Proková, EkoFond, n.f. SPP
Eva Gulíková, EkoFond, n.f. SPP
Marta Minarovičová, Congress and Educational Centre, s.r.o.
Silvia Priamová, Congress and Educational Centre, s.r.o.
Zuzana Kyrinovičová, Congress and Educational Centre, s.r.o.
František Doktor, Congress and Educational Centre, s.r.o.

We would like to express our thanks to all members of the NQP for their contributions.

Financing

Elaboration of the report is financed by the European programme Intelligent Energy Europe – IEE

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11. List of abbreviations

AES	- Adult Education Survey
AK	- Accreditation Committee
APEE	- Energy Efficiency Action Plan
b.c.	- current prices
s.c.	- constant prices
BD	- residential buildings
BUSSK	- project Build-Up Skills Slovakia
CSS	- Slovak Roofers Craft Guild
CTZ	- central heat source
CVTS	- survey on further vocational training in enterprises
ČSN	- Czechoslovak Technical Standard
EE	- energy efficiency
EHB	- energy efficiency of buildings
EHPA	- European Heat Pump Association
EKR/EQF	- Európsky kvalifikačný rámec/European Qualification Framework
EP	- energy policy
EPBD	- Energy Performance of Buildings Directive
EPS	- expanded/foam polystyrene
EPS/F	- type of foam polystyrene (facade)
ETA	- European Technical Approval
ETICS	- External Thermal Insulation Composite Systems
HDP	- gross domestic product
HSV	- main building production
IKT	- information and communication technologies
KCEB	- Competence Centre of Vocational Education for EE and use of RES in buildings
KVET	- Highly efficient combined production of electricity
MDVRR SR	- Ministry of Transport, Construction and Regional Development of the Slovak Republic
MH SR	- Ministry of Economy of the Slovak Republic
MPSVR SR	- Ministry of Labour, Social Affairs and Family of the Slovak Republic
MSP	- small and medium enterprises (SME)
MŠVVŠ SR	- Ministry of Education, Science, Research and Sport of the Slovak Republic
NAP	- National Action Plan
NBS	- National Bank of Slovakia
NKP	- National Qualification Platform of the project BUSSK
NR SR	- National Council of the Slovak Republic
NSP	- National System of Occupations
NZEB	- Near zero energy buildings
OZE	- RES (renewable energy sources)
PPP	- Public Private Partnership
PSV	- associated building production
RD	- family houses
REFUGE	- project Renewable Energy for Future Generations
SIEA	- Slovak Innovation and Energy Agency
SME	- small and medium enterprises
ŠOŠ	- Secondary Vocational School
SOU	- Secondary Apprenticeship school
SPP	- Slovak Gas Company
STAV 3-04	- Quarterly Statistical summary of initiation, construction and completed dwellings
STN	- Slovak Technical Standard
SZCHKT	- Slovak Association for Cooling and Air-conditioning Technology

SŽK	- Slovak Chamber of Trades
SŽZ	- Slovak Trades Association
ŠIOV	- State Institute of Vocational Education
ŠÚ SR	- Statistical Office of the Slovak Republic
TKS	- division of residential buildings by type, construction systems and building systems
TNB	- Near zero energy building
TO	- National Technical Approval
TSÚS	- Building Testing and Research Institute
ÚIPŠ	- Institute of Information and Prognoses of Education
ÚRSO	- Regulatory Office for Network Industries
ÚVS	- Congress and Educational Centre
VaV	- research and development
VET	- vocational education and training
VNB	- type of construction technology
VÚC	- upper territorial unit
WG	- working group
ZSPS	- Association of Construction Entrepreneurs of Slovakia

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.