



# Roadmap for Training Workforce in Lithuanian Construction Sector

in order to meet  
energy efficiency targets 2020



BUILD UP SKILLS - LT  
KAUNAS 2013



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### **Further information**

More details on BUILD UP SKILLS – LT can be found at <http://energinisefektyvumas.lt/>

More details on Build up Skills can be found at [www.buildupskills.eu](http://www.buildupskills.eu)

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



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## PREFACE

This document introduces roadmap for priority measures for the Lithuanian 'blue collar workers' qualification improvement system in pursuance of 2020 targets in the fields of increasing energy efficiency of buildings and the use of renewable energy.

In the process of preparing of the roadmap the participants in the project realized the importance of scientific research, the updating of higher school curricula, improvement of engineering personnel qualification, the improvement and importance of early professional guidance in schools (including elementary schools), necessary for achieving of these targets; however, these issues are not the object of the IEE (Intelligent Energy Europe) programme project. Therefore, the roadmap only set out and analyse qualification improvement measures for on-site construction workers, whereas the other aforementioned issues are considered only to the extent they concern mentioned occupations, and could be analysed in more detail in other national activities and projects related to the improvement of the qualification system.

# 1.



## SUMMARY

European Union directives introduce new qualitative and quantitative requirements for energy performance of buildings and use of renewable energy sources, which should be implemented since 2018 in newly built public buildings and since 2020 – in all newly built buildings. The energy performance of buildings under Lithuanian Law is measured in energy classes which are assigned to buildings during initial certification. B, A and A+ class buildings are categorized as low-energy buildings, whilst A++ class buildings are considered virtually zero-energy buildings, which meet the 2020 requirements for buildings. The stages of increasing energy performance of buildings to be achieved by 2020 are provided in Figure 1.1. There are plans to continuously improve insulating properties of building envelopes, reduce the effect of thermal bridges of the envelopes, increase building tightness, use effective building ventilation (including recuperative systems ) more often and increase the use of energy produced from renewable resources inside or outside the building for both the heating of buildings and hot water. The achievement of these objectives will involve the use new or improved building materials, constructions and technologies, as well as require high quality of works, therefore, there is a need for new knowledge and skills of all participants in all levels of the construction process, with particular emphasis on preparation of employees to perform high-skilled installation works of building constructions and the production of energy from renewable sources.

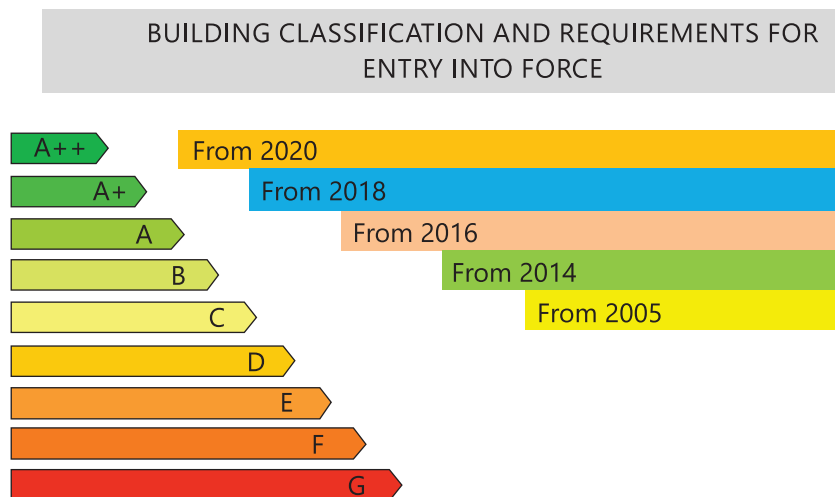


Figure 1.1 Implementation stages of the requirements for the construction of energy efficient buildings

The roadmap have been developed following the evaluation of results from an analysis of qualification improvement of working class occupations in the construction sector (“Status Quo” analysis) the implementation stages (Fig. 1) of the construction of new energy efficient buildings, as well as the goal of the EU IEE programme BUILD UP SKILLS – LT Project .This Project is designed to promote a qualification improvement plan for construction sector workers necessary for the

achievement of the 2020 energy performance targets of buildings. Since some of the specified measures are suitable not only for the qualification improvement of working class occupations, but also for construction specialists at all levels, the roadmap will be useful for all participants engaged in the construction process.

The platform was established for the development of professional training roadmap that affect all stakeholders interested in and allowed to participate in this process, i.e.) Ministries and their subordinate institutions, professional associations, vocational training bodies, construction companies, building material manufacturers and suppliers (Table 1.1). All participants of the platform were given the information and the majority of them took part in various themed meetings of the platform.

Table 1.1 Participants of the platform

MINISTRIES				
				
Ministry of Environment	Ministry of Education and Science	Ministry of Economy	Ministry of Energy	Ministry of Social Security and Labour
INSTITUTIONS SUBORDINATE TO THE MINISTRIES				
				
Certification Centre of Building Products (SPSC)	Qualifications and Vocational Education and Training Development Centre (KPMPC)	State Energy Inspectorate under the Ministry of Energy the Republic of Lithuania	Lithuanian Labour Exchange	
				
Centre of Information Technologies in Education	Energy Agency	European Social Fund Agency		
ASSOCIATIONS				
				
Lithuanian Builders Association (LSA)	Lithuanian Association of Civil Engineers (LSIS)	Association of Local Authorities in Lithuania	Lithuanian Association of Consulting Companies (LIACC)	
				
Nacionalinė Pasyvaus Namų Asociacija National Passive House Association (NPNA)	Polistireninio putplasčio asociacija Polystyrene Foam Association	Lietuvos Santechnikų Asociacija Lithuanian Plumbers Association	Respublikinė Langų ir Durų Gamintojų Asociacija Republican Association of Manufacturers of Windows and Doors	
				
Lietuvos Saulės Energetikos Asociacija Lithuanian Solar Energy Association	Lietuvos Architektų Sąjunga Architects Association of Lithuania (LAS)	Lietuvos šilumos siurblių asociacija Lithuanian Heat Pump Association	Lietuvos atsinaujinančių išteklių energetikos konfederacija Lithuanian Confederation of Renewable Resources	

## BUSINESSES



AB Panevėžio  
Statybos Trestas



AB YIT Kausta



UAB Daistatus



UAB MEBA



UAB Alkesta



UAB Wavin Baltic



UAB Sakret



UAB Eternit Baltic



UAB Saint-Gobain  
Statybos Gaminiai



UAB Sistela



UAB Arginta



UAB Revitalis



UAB Monier

Other companies  
of the associations

## EDUCATIONAL INSTITUTIONS



National Training Centre for  
Energy Specialists



Vilnius Jerusalem Labour  
Market Centre



Vilnius Builders Training Centre



Kaunas Technical College



Vilnius College of  
Technologies and Design



Kaunas University of  
Technology



Vilnius Gediminas  
Technical University

A website was created for publishing project information and results: [www.energinisefektyvumas.lt](http://www.energinisefektyvumas.lt).

The professional training roadmap includes 4 qualification improvement directions for workers in the construction and renewable energy fields in pursuance of the 2020 targets for the construction sector. After assessing the results of the "Status Quo" analysis and the new requirements for the construction of energy efficient buildings, strategic objectives for each direction were formulated (Figure 1.2):

Direction 1: **dissemination and promotion of information.** Dissemination of information on the 2020 targets, the promotion of energy performance and use of renewable energy sources should provoke the interest of all participants in the construction sector in order to develop new knowledge and skills.

The strategic goal of this direction is to increase demand for the knowledge and skills of participants within the construction sector for the increased energy performance of buildings, based on the requirements of European Union directives, the economic benefits, and importance of environmental protection and energy self-sufficiency of the country.

Direction 2: **adaptation of the vocational training system to the new demands.** Taking into consideration the demand for new knowledge and skills, the vocational training system should be prepared and suitable for the workers' qualification improvement process by providing additional training to current workers and preparing new ones in accordance with the updated, market labour on-going training programmes.

The strategic goal of this direction is to adapt the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets in the labour market.

Direction 3: **implementation of qualification improvement activities.** Training of new workers and qualification improvement and vocational reorientation of workers currently in the market should be carried out according to constantly updated and qualitatively evaluated training programmes.

The strategic goal of this direction is to implement an updated training system ensuring the necessary number of qualified workers specified in the stages of achievement of the 2020 targets.

Direction 4: **quality assurance of the qualification system and the development and constant update of the database for the promotion of qualification improvement.** The training, promotion and information dissemination service of the required qualifications is an accessible, easy to find information system.

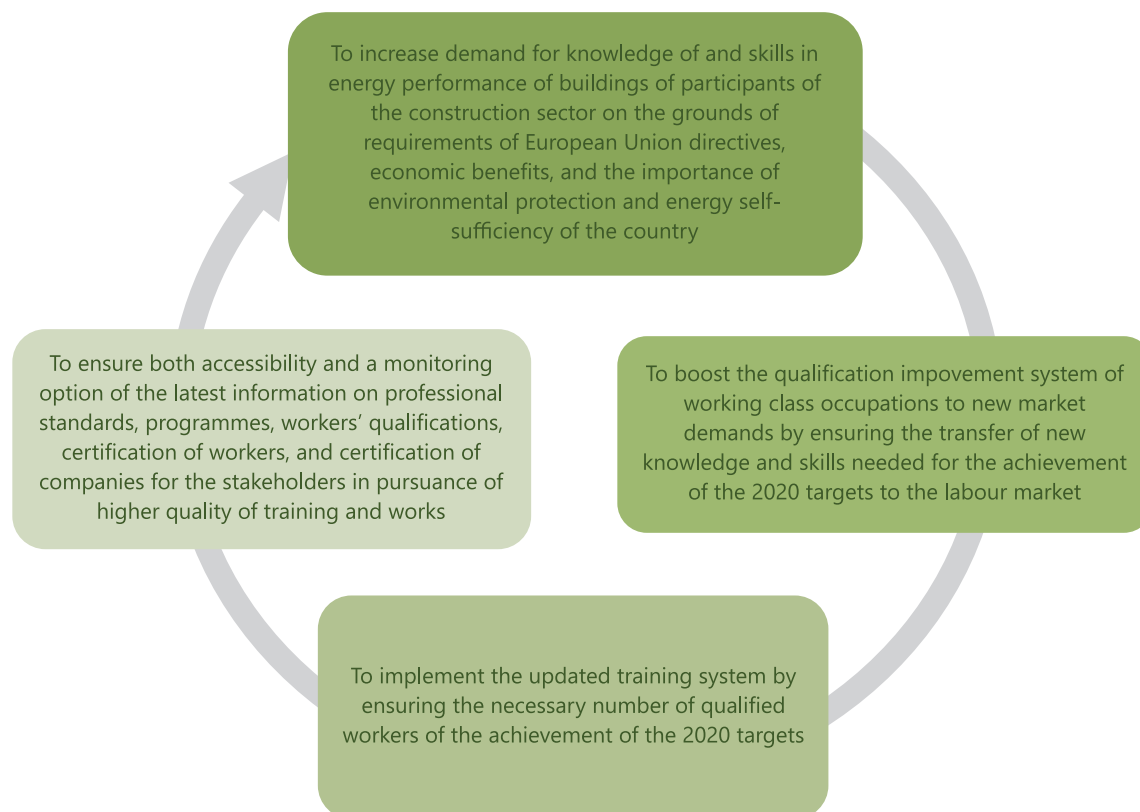


Figure 1.2 Strategic objectives

These directional strategic objectives help to ensure the latest information on professional standards, training programs, workers' qualifications, certification of workers, company certification, availability of stakeholders and monitoring capability.

For each goal there are objectives, measures, responsibilities and possible sources of funding. The plan for preparing construction workers for the construction of energy efficient buildings, as well as effective use of technologies for renewable energy sources is provided in the diagram (Fig. 1.3). The detailed description of measures for the implementation of the plan is provided in the main part of the roadmap in Chapter 3.

The roadmap, evaluated and refined according to comments and proposals submitted during work meetings of the platform and approved by the representatives of various related institutions and organizations, will be announced publicly. They can be used by all participants in the sectors of construction and the use of renewable energy in buildings (state, business, and education and training institutions) for the activities of increasing energy performance of buildings and workers' qualification improvement, as well as planning and coordinating administrative and financial resources.



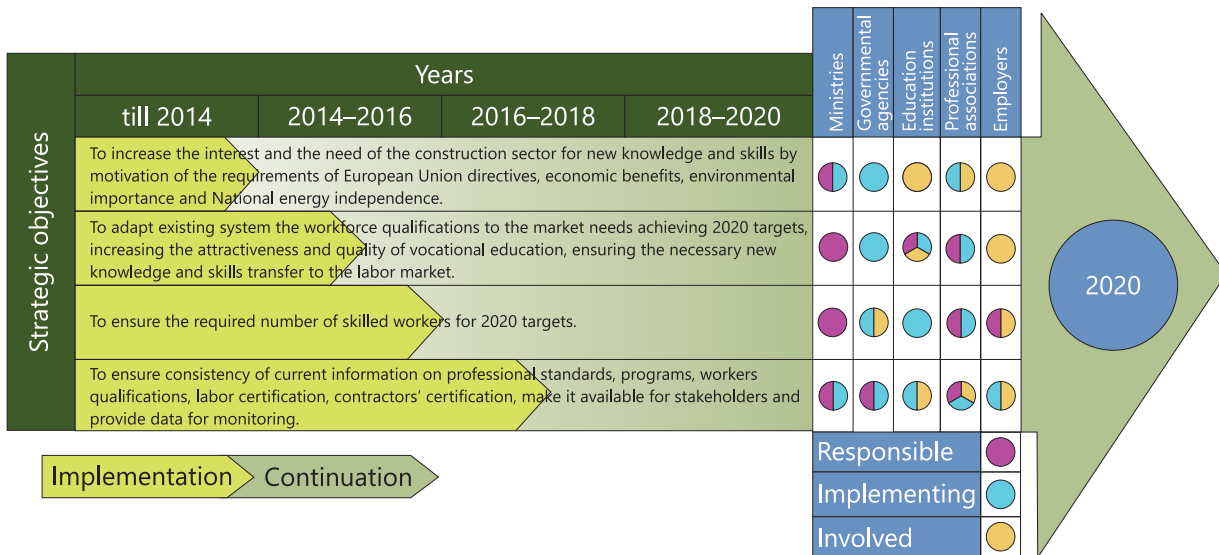


Figure 1.3 The implementation plan for preparing construction workers for the construction of energy efficient buildings, as well as effective use of technologies for renewable energy sources

# 2.



## INTRODUCTION

Buildings in Europe use up around 40 % of all produced or imported energy, a third of this amount is used by industrial, commercial and public buildings (offices, schools, hospitals, hotels, etc.), the remainder is used by residential premises. There is therefore a great potential to reduce the consumption of energy.

At the moment, the main legal act defining guidelines for efficient use of energy in buildings in the European Union until 2020 is the Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings. The following directives are also directly related to this directive: Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services.

Directive 2010/31/EU specifies targets for increasing energy efficiency in the construction sector by 2020:

**Reduce energy consumption by 20%** by 2020;

**20%** of energy should be produced from **renewable energy sources** by 2020;

**Reduce overall greenhouse gas emissions by 20%** (as compared to the 1990 levels) and 30 % in the event of an international agreement being reached by 2020;

As of 2018 all public buildings, and **as of 2020 all new buildings** should be virtually zero-energy buildings.

The directive provides a definition for a nearly zero-energy building, specified in Lithuanian legal acts, as well as differentiating between low-energy and nearly zero-energy buildings.

Directive 2010/31/EU: nearly zero-energy building – a building that has very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

STR 2.01.09:2012: low-energy buildings (or parts thereof) are buildings (or parts thereof) conforming to the requirements of this Regulation for B, A, A+ class buildings;

STR 2.01.09:2012: nearly zero-energy building are buildings that meet the requirements of this Regulation for A++ energy efficiency class buildings, i.e. buildings with very high energy performance, where energy consumption is almost zero or very low; most of the energy comes from renewable energy sources, including energy from renewable sources produced on-site or nearby

Requirements of the Construction Technical Regulations STR 2.01.09:2012 “Energy performance of buildings. Certification of Energy performance”, which came into effect on 09 January 2013 and are intended for the implementation of the requirements of the new directive 2010/31/EU, for envelopes of energy efficient buildings, efficient use of energy in buildings, and use of renewable energy sources.

For the implementation of the requirements of directive 2010/31/EU Lithuania has set transitional requirements for newly built buildings according to energy performance classes of buildings (STR 2.01.09:2012).

New buildings and their parts must meet the following requirements:

Until 01 January 2014 – requirements for C class buildings;

Since 01 January 2014 – requirements for B class buildings;

Since 01 January 2016 – requirements for A class buildings;

Since 01 January 2018 – requirements for A+ class buildings;

Since 01 January 2021 – requirements for A++ class buildings;

The regulation contains mandatory requirements to assess all buildings and determine their energy performance classes.

Additional requirements are made for heat transfer coefficients of A, A+ and A++ class building envelopes, tightness and use of heat recovery ventilation system. A++ class buildings are also subject to the requirement to produce a certain amount of energy from renewable energy sources. Requirements for heat transfer coefficients of A++ class building envelopes are about twice as strict (normative values of heat transfer coefficients of building envelopes are about twice as low) in comparison to current requirements. There are also requirements to reduce thermal bridges in building envelopes. Values of heat transfer coefficients and thermal resistance of building envelopes regarding low-energy and nearly zero-energy residential houses are provided in Table 2.1.

Table 2.1 Values of heat transfer coefficients of residential house envelopes –  $U$ ,  $W/(m^2 \cdot K)$  (resistances –  $R$ ,  $m^2 \cdot K/W$ )

Envelope	Since 2005	A class	A+ class	A++ class
Roofs	0,16 (6,3)	0.10 (10)	0.09 (11)	0.08 (12.5)
Walls	0,20 (5,0)	0.12 (8.3)	0.11 (9.1)	0.10 (10)
Floors	0,25 (4,0)	0.14 (7.1)	0.12 (8.3)	0.10 (10)
Windows	1,6 (0,63)	1.0 (1.0)	0.85 (1.2)	0.70 (1.4)
Doors	1,6 (0,63)	1.0 (1.0)	0.85 (1.2)	0,70 (1,4)

Guidelines for increasing of use of renewable energy sources are provided in the “National Energy Strategy” approved by the 26 June 2012 decision of the Seimas of the Republic of Lithuania No. XI-2133. It is provided that by 2020 renewable energy sources will account for no less than 23% of total energy consumption.

The new requirements for energy performance of buildings and the use of renewable energy sources is a big challenge to the construction sector, since the implementation of these requirements demands new technological solutions, equipment and construction products. Therefore, both engineering personnel and qualified workers installing new products, equipment and technology, which ensure high quality of works, will need new knowledge and skills. In order to adequately prepare for these changes and train the necessary number of qualified workers for each stage of the construction of energy efficient buildings, there needs to be a strategy for qualification improvement and skills assessment of workers in the fields of renewable energy of construction and buildings, as well as information dissemination. Only coordinated efforts of all interested participants – the state, training and business institutions – will ensure smooth and timely implementation of the objectives in respect of increasing energy performance of buildings.

The “Status Quo” analysis conducted in the first part of this project notes that the construction sector is one of the most important ones for the national economy. It creates approximately 10 % of the GDP and positively affects growth of employment in other related economic activities. Therefore, it is extremely important that this industry successfully implements the new requirements in the fields of efficient production and use of energy, as well as those concerning environmental protection.

After completing surveys of construction companies, it was found that not all of them consider the importance of workers’ qualification improvement responsibly. By using questionnaires it was found that the majority of workers (and employers) of construction companies see no need for training – qualification improvement, and therefore, seek to take advantage of existing

labour market offers. Lithuanian construction companies are small and therefore, have limited time and financial resources for training. The immature technology market of the construction of energy efficient buildings does not require significant qualification improvement of such workers. However, the implementation of the EU directives can change this attitude, it is necessary to prepare for it.

In order to establish conditions for workers to improve their qualification in the fields of construction and production of renewable energy in buildings, as well as preparation for the implementation of the directive 2010/31/EU, an analysis of the Lithuanian vocational training system, analysis of training programmes related to energy performance of buildings and the use of renewable energy sources and a questionnaire survey of vocational training institutions was carried out. Currently there are 79 vocational training institutions in Lithuania, which teach over 46 thousand students. Vocational training providers can provide information on formal and non-formal vocational training programmes on the Lithuanian Labour Exchange website. At the end of November 2012 on the LDB website there were 1646 non-formal and 2597 formal training programmes registered.

After structuring of information of the existing qualification improvement system, the project coordination group prepared this visual model of the qualification system.

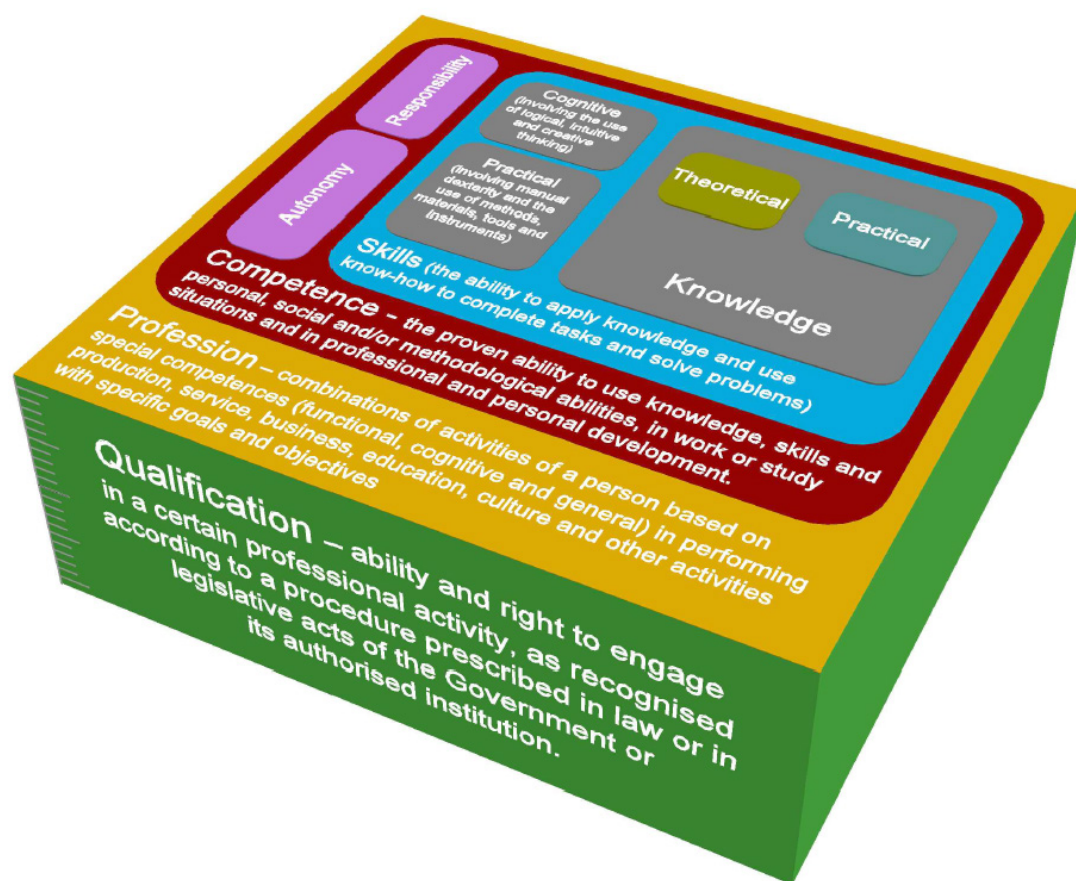


Figure 2.1 Existing national qualification system

The vocational training system is currently intensively preparing for changes. There has been practical construction sector training centres established, improvement of technological competences of trainers and lecturers in the construction sector is being carried out, modular training programmes of the construction sector are being developed and training facilities are being upgraded.

Workers' qualification improvement is primarily associated with continuous formal and non-formal vocational training. Initial training must also include training programme additions in order for the newly prepared specialists to enter the market with necessary knowledge and skills.

After performing the analysis of training programmes and the data from questionnaire surveys of vocational training institutions, it is obvious that vocational training institutions are quite effective in reacting to changing knowledge and skills in the market; they develop new and update existing training programmes. However, there is clearly a delay, especially in initial training programmes. Vocational training institutions (in the field of the construction of energy efficient buildings) are better prepared than those in the field of the technologies of renewable energy sources. The relevance of efficient use of energy in buildings was raised 20 years ago (around 1992) and the requirements for it are constantly increasing. Therefore, in many cases vocational training institutions already have proper training programmes, teaching personnel and a training base which only needs to be updated and supplemented according to the new requirements for energy efficient buildings. Renewable energy source technologies are in many cases less assimilated in the vocational training field, therefore the development of new programmes and update and supplementing of old ones must be given greater attention. In all cases the assimilation of new materials and technologies depends greatly on non-formal training carried out by suppliers of new materials and technologies, which initially satisfies the demand for training in the labour market, whereas later lacking knowledge and skills are transferred to formal training programmes. The questionnaire data also showed that training institutions are planning new training programmes related to increasing energy performance of buildings and the use of renewable energy sources.

Vocational training institutions that participated in the survey were optimistic in their evaluations of their readiness for training new workers in the construction of new energy efficient buildings and the use of renewable energy source technologies, as well as for improvement of employed workers qualification. However, the study revealed that the equipment used in the training process does not satisfy the latest technological developments and there is also a lack of highly qualified trainers. Quite a few respondents noted that there is a lack of experience in such training, lack of learning resources and practical skills, as well as of new training programmes. Despite that, training institutions are hesitant to practically update training programmes, since standards for most demanded professions have not yet been developed.

A formal vocational training programme must meet a professional standard describing the qualification; however, currently these standards are under development. At the moment, this is the weakest link in Lithuanian vocational training market. The procedure for funding the development of a non-formal training programme has not been established either. Under existing legal acts development and adaptation activities of training programmes and related activities are not eligible for funding, therefore are not supported. Table 2.2 provides demands for knowledge and skills of qualified workers identified during the questionnaires surveys.

During the analysis it was found that the monitoring of the education system does not satisfy modern demands, since it only includes generalized education indicators. Successful implementation of the directive 2010/31/EU requires collection of additional data on the situation in the construction sector labour market. Data related to the implementation of the directive is vitally needed: there is a knowledge and qualifications gap and professional training institutions are ready to provide the necessary knowledge on the various professions. There is only a national accreditation and certification system in Lithuania for energy sector employees (installers). System is implemented by the State Energy Inspectorate under the Ministry of Energy the Republic of Lithuania. On September 6, 2012 the new training and certification procedures for specialists of renewable energy sources production equipment were approved. They set out qualification requirements for installers of equipment and training programmes and define the procedures for certification. These procedures allow the certification of installers of biomass boilers and non-masonry heaters, geothermal systems and heat pumps, as well as sunlight and solar energy production equipment.

Table 2.2 Demand for knowledge and skills of qualified workers in the construction of energy efficient buildings and the production of renewable energy.

Demand for knowledge	Demand for skills
<ul style="list-style-type: none"> <li>● Knowledge of technological solutions of envelope sealing</li> <li>● New materials and products of envelope sealing.</li> <li>● Requirements for the quality of works. Quality control of envelope tightness.</li> <li>● Knowledge of the basics of thermal physics. Heat and moisture transfer methods in various environments.</li> <li>● Knowledge of requirements for tightness, ventilation and air quality in buildings.</li> <li>● Knowledge of priority measures for efficient reduction of energy consumption.</li> <li>● Knowledge of interoperability of new materials and technologies.</li> </ul>	<ul style="list-style-type: none"> <li>● To be able to work with new sealing materials;</li> <li>● To be able to work with new equipment;</li> <li>● To be able to apply new technologies.</li> <li>● To be able to perform proper sealing of envelope construction elements and engineering equipment connections.</li> <li>● To be able to use envelope sealing material or product.</li> <li>● To be able to perform quality control of envelope tightness.</li> </ul>

The “Status Quo” report provides forecast demands for employees until 2020 by taking into account both pessimistic and optimistic predictions of construction sector development. Table 2.3 provides results of the forecast for the demand for training and improvement of workers qualification. Since the majority of workers in construction occupations have to be retrained, formal and non-formal continuous training has to react to and be prepared for the possible increase in demand for training. This means that training programmes must be updated, supplemented with information necessary for gaining required knowledge and skills, a training base must be developed and trainers must be prepared (if necessary – further trained themselves). Results of an expert and mathematical evaluation show that up to 39,000 workers will have to be prepared by 2020 (retrained or have improved qualifications).

Build Up Skills initiative project is focused on a specific target group – working class occupations within the construction sector, since the European Commission believes that currently there is a high demand for workers who must have skills related the construction of low-energy buildings and the installation and maintenance of renewable energy source systems. The European Commission also acknowledges the strategic importance of other professions, for example, energy experts and consultants, architects and engineers. Even though these professions are not included in the scope of this study, the project implementers believe that the objectives of the project can only be implemented through a comprehensive assessment of the readiness of all construction sector employees for the implementation of the 2020 targets.

Table 2.3 Annual forecasts of demand for qualified workers for the construction of energy efficient buildings and the installation of production technologies for renewable energy.

	Number of employees trained or improving their qualification								Total number to be trained during 2012–2020	Assumption that only 50% needs to be trained
	2013	2014	2015	2016	2017	2018	2019	2020		
Pessimistic scenario	7365	8987	8988	8899	9105	9017	9024	9035	<b>70419</b>	35210
Likely scenario	7405	9299	9350	9369	9414	9434	9160	9786	<b>73216</b>	36608
Optimistic scenario	7473	10012	10077	10159	10033	10503	10382	10454	<b>79096</b>	39548

# 3.



## PRIORITY MEASURES FOR WORKFORCE QUALIFICATION SYSTEM IMPROVEMENTS IN ORDER TO REACH 2020 OBJECTIVES IN THE FIELD OF THE ENERGY EFFICIENCY AND RENEWABLE ENERGY USE

### 3.1. Development stages of professional training roadmap

The BUILD UP SKILLS – LT programme project is carried out in two stages. The first stage involved conducting “Status Quo” analysis, later developing an action plan for the improvement of workers qualification in the fields of the construction of energy efficient buildings and the use of renewable energy source technologies. A qualification improvement platform made up of representatives of stakeholder institutions and organizations actively participated in this project stage. A schedule of the meetings of the platform is shown in Fig. 3.1.

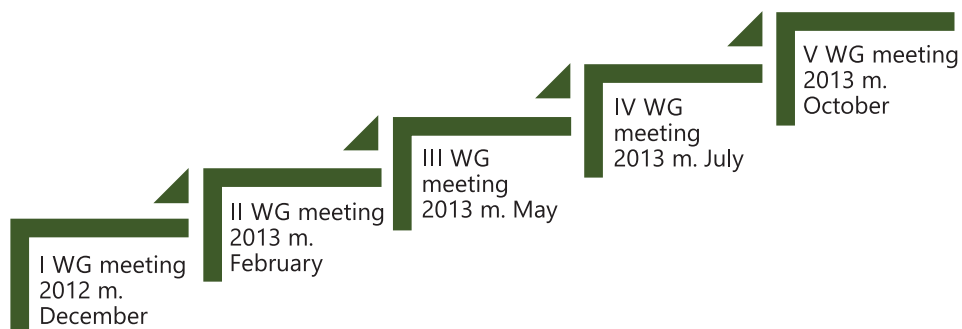


Figure 3.1 Schedule of meetings for the qualification improvement platform

The first meeting of the platform in the Lithuanian Exhibition and Congress Centre LITEXPO (Fig. 3.2) introduced the “Status Quo” analysis results as a basis for developing qualification improvement roadmap. Topics and activity directions were also initiated, these were later included in the roadmap.

The second meeting of the platform introduced a plan for the development of the roadmap: content, introduction and strategic goals of the roadmap. Implementation measures for these goals were offered, there was an on-going discussion on possible measures, ranking of measures, targeted measures and responsible institutions were clarified.

The third meeting of the platform introduced an action plan for the implementation of the 2020 targets. Various aspects of the implementation of the specified measures were discussed in details.



*Figure 3.2. Moments of working groups meetings*

After the third meeting of the platform, taking into account discussion outcomes and comments made by the participants, draft roadmap for qualification improvement was prepared. An internet survey of experts was carried out in order to evaluate the initial draft roadmap. A questionnaire was developed according to each goal of the roadmap and each part of the action plan, in order to evaluate the relevance of the set goal and the expediency of the measures. 130 respondents participated in the survey (74.6 % business, 20 % higher education and vocational training systems and 5.4 % state authority representatives). More than half of the respondents were in the top level managers of the companies. 56 % of the respondents have already been acquainted with the content of the draft roadmap. After summarizing of the survey results, it was found that the goals of the draft roadmap and implementation measures were viewed positively (more than 60 % of the responses either "agreed" or "fully agreed"). Therefore, we can say that the qualification improvement measures for workers in the fields of the construction of energy efficient buildings and the use of renewable energy source technologies are agreed to by the majority of interested state, education and training participants, as well as business institutions. This creates preconditions for successful implementation of the activities set out in the qualification improvement roadmap and the achievement of the 2020 targets for increasing energy performance of buildings and the use of renewable energy in buildings.



*Figure 3.3. Moments of working group meetings*

By taking into account the survey results, roadmap developers adjusted the intermediate version of qualification improvement roadmap, which was discussed in the fourth meeting of the platform.

Taking into account the outcomes of this fourth meeting, adjustments of the qualification improvement roadmap were made; the document was edited, translated into the English language and prepared for publishing. The fifth meeting of the platform is intended for approving the qualification improvement roadmap and discussing further steps in the implementation of the action plan.



## 3.2. Main directions and objectives of the qualification improvement roadmap

According to the “Status Quo” analysis results and in accordance with the new requirements for 2020 to build energy efficient buildings and use renewable energy sources for energy production, strategic goals and stages of qualification improvement of workers were established. The main activities of qualification improvement will be assigned to vocational training institutions, which can prepare qualification improvement programmes and additionally train workers, i.e. prepare them for the construction of energy efficient buildings and installation of equipment for the production of energy of renewable energy sources. For this purpose, the potential of non-formal vocational training could also be used by setting qualitative requirements for such training. Initial vocational training will also require a prompt update of training programmes and qualification improvement of trainers in order for graduates to be prepared for the latest challenges posed by technological requirements. The intensification of these processes further requires dissemination of information on expected changes and new requirements; this would increase the motivation of all participants within the construction field to improve their qualifications. Motivation for qualification improvement and its quality assurance require an information system with registers for qualification improvement, certification, requirements, monitoring, which would improve market conditions for higher-qualification workers. 4 areas of qualification improvement activities have been defined (Fig. 3.6):

**1. Dissemination and promotion of information.** Workers must be prepared for the achievement of the 2020 targets primarily by improving the qualifications of current employees. The necessity of qualification improvement needs to be understood by all construction chain units, from users of buildings and energy to implementers of all works, i.e. the workers. This goal requires more intensive dissemination of information on new requirements of European Union directives and Lithuanian legal acts related to their implementation, the binding nature and stages of these requirements, economic benefits of efficient energy consumption in buildings and the use of renewable energy, importance for environmental protection, including effect on climate change and rational use of natural resources, as well as the increase of energy self-sufficiency of the country.

**2. Adaptation of the vocational training system to the new demands.** The qualification improvement system must be focused on the demand for new knowledge and skills and prepared for the qualification improvement process by additionally training current and new workers in accordance with constantly updated training programmes satisfying the latest demands of the labour market. For this purpose, the legal basis for the preparation of training programmes has to be updated, i.e. vocational training standards for the installation of construction and renewable energy production equipment have to be developed, vocational training programmes have to be developed or updated and the description of the procedure for modular training has to be prepared.

**3. Implementation of qualification improvement measures.** A successful implementation of the qualification improvement programme primarily requires increasing the attractiveness of the construction sector and the working class occupations related to the installation of renewable energy sources. This is necessary in order to attract new people to choose these professions and for current workers to see long-term perspectives in this field and be motivated to improve their qualification in the hope of getting more favourable work conditions and salaries. Additionally they will see life-long learning perspectives and qualification improvement opportunities. Vocational training institutions must use updated (or newly developed) training programmes adjusted to changing market needs. It is especially important for initial training institutions, which would prepare graduates for the labour market so they do not need to start improving their qualification right away. Qualification improvement also requires using the non-formal training system, since this is how key knowledge on the use of new materials, technologies and equipment reaches the labour market. By properly forecasting the demand for employees for the construction of energy efficient buildings and the use of renewable energy sources, as well as the qualifications

necessary for these jobs, the labour exchange can actively adjust qualification improvement or the professional reorientation of unemployed people, thereby directing more people to appropriate training. In order for the country's vocational training institutions not to become a free workforce development place for the labour markets of other countries, measures need to be set on how to use the country's investments in qualification improvement to increase the well-being of the country itself, for example, in the form of contracts with students;

4. **Development of quality assurance and a qualifications database** in order to facilitate and promote qualification improvement, a publicly available and easily accessible information system should be used. It should provide constantly updated information on the demand for workers, training opportunities and construction objectives.

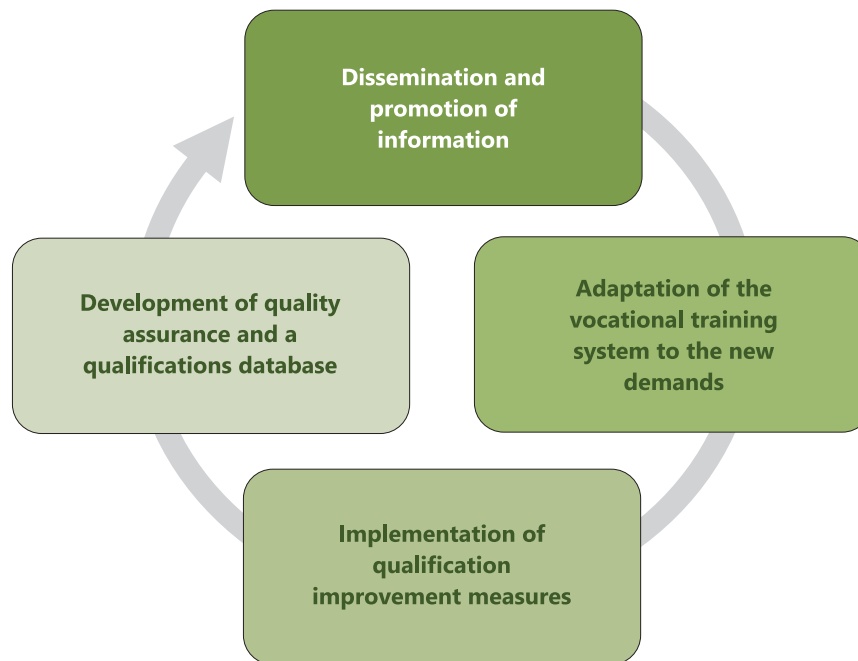


Figure 3.4 Qualification improvement stages

Each activity direction has a strategic goal, which has measures for execution and responsible institutions specified for implementation.

**1. STRATEGIC GOAL:** to increase demand for knowledge of and skills in energy performance of buildings of participants of the construction sector on the grounds of requirements of European Union directives, economic benefits, and the importance of environmental protection and energy self-sufficiency of the country.

**Description of activities:** dissemination of information on the 2020 targets in respect of reduction of energy consumption in the construction sector, opportunities for efficient use of energy in buildings and the importance of the use of renewable energy sources.

**Current situation (description of the issues):**

- The construction sector has little awareness on the commitments on the fulfilment of the requirements of the Energy Performance directive.
- There is little demand for energy efficient buildings;
- Undefined development perspectives of the construction sector, insufficient state promotion of energy efficient construction;
- Companies are not and do not plan to allocate funds for training;
- Insufficient number of trained workers prepared to build energy efficient buildings and install engineering systems;

- The construction sector lacks coordination in preparing for the accomplishment of the tasks of the directive.
- Underestimated training and qualification of workers to install new technologies or to use new building materials.
- No demonstration projects where science and business could test various technological, organizational and financial measures.
- Innovations are not encouraged. All solutions are usually purchased by applying lowest cost principles.

The following objectives and measures are established for the first goal:

**1.1. Objective.** Publication of implementation stages of measures for increasing energy efficiency, set out in legal acts, on the websites and during seminars organized by responsible institutions

**1.1.1. Measure.** Preparation of information EPBD targets seminars and implementation stages with achievements.

Many participants of the construction sector are not aware of the targets and objectives set out by the EU energy performance directive. Construction organizations take the erroneous view that it is merely a further increase in the thickness of building envelope in isolation and believe that they are prepared for such insignificant changes. However, the achievement of the targets requires not only increasing the thickness of building isolation, but also ensuring tightness of the building, optimizing the ventilation system, using energy and renewable energy source production measures and other innovations. Therefore, the creation of an information section on the necessity, goals and implementation stages of increasing energy performance of buildings (EPBD) on the websites of the Ministry of Environment (AM), Ministry of Education and Science (ŠMM), Ministry of Economy (ŪM), Ministry of Energy (EM) and their subordinate institutions (public enterprises) would be an important measure in drawing stakeholders' attention to future changes in the construction sector. It will further encourage them to show greater interest in the methods and measures for achieving the goals Bi-annual updates(minimum frequency) of the information section would be a sufficient measure for dissemination of information to relevant people and organizations.

**1.2. Objective.** The energy efficiency improvement of Courses and the advantage of the promotion of professional associations and their information systems professionals organized training and certification Courses.

**1.2.1. Measure.** Information section of the implementation of the EPBD objectives and benefits of the development of social network sites (e.g. LSA, LSIS, other professional association websites) and update no less than bi-annually.

Small and medium sized companies play an important role in the process, which consider professional associations as the main source of information on future plans and requirements. The websites of these associations must also provide information on the plans of increasing energy performance of buildings, as well as challenges that need to be addressed. By going through the information on the certification of companies and specialists, managers or construction companies would find information on energy performance and methods and ways to prepare for the new stage of activities. It is suggested to have 1 information section on a professional association's website and also provide links to the association's and ministries' websites on the websites of the association's subdivisions.

**1.2.2. Measure.** Addition of information sessions on the EPBD requirements and their economic and environmental protection benefits to the certification and qualification improvement programmes of construction engineers.

Construction specialists should improve their qualification within 5 years by attending seminars of at least 20 hours length in accordance with the training programmes approved by the Ministry of Environment. In order to better inform construction specialists on the 2020 targets, it is recommended that the seminar programmes include no less than 2 hour long lectures, which would introduce new requirements and their solutions. This would create interest within

construction specialists and would encourage them to prepare more actively for the achievement of the set targets, including the demand for obtaining new qualifications and improving current skills for construction workers.

**1.3. Objective.** Dissemination of preparedness of VET providers to train workers for construction of energy efficient buildings.

**1.3.1. Measure.** Introduction of the preparations to develop new working class occupations and qualifications in educational exhibitions.

The activity of gaining new qualifications and improving current skills of workers in the area of the installation of equipment for the production of construction energy from renewable energy sources can also be increased by vocational training institutions. They will need to prepare for the implementation of the new construction demands by introducing new or updated professions and qualifications related to the construction of energy efficient buildings in both the construction exhibition "Resta", education exhibition "Mokykla", as well as by organizing competitions for young construction workers and participating in international qualification improvement competitions. This would increase interest in the construction worker's profession and the number of students selecting these professions would increase.

**1.3.2. Measure.** Development and dissemination of information on different training opportunities and qualification improvement programmes possibilities for new working class occupation via professional associations.

VET providers should publish information on new and updated professions and qualifications related to the construction of energy efficient buildings and the use of renewable energy sources in buildings in schools, via the media and other means of information such as by the distribution of leaflets, which should be updated no less than every 2 years.

**1.3.3. Measure.** Adding of new types of working class specialities and qualifications to the labour - exchange information system by specifying the training institutions.

The information system of the Lithuanian Labour Exchange always provides information on professions and qualifications in which there is a shortage, however it is only published when there is already a lack of workers in a specific profession. It is suggested this system should be supplemented with professions related to the construction of energy efficient buildings so that after the construction of such buildings commences, unemployed people would already have the necessary professions and qualifications and there would not be an existing shortage of workers in this area. The adding of new professions and qualifications to the information system should be done at least once a year.

**1.4. Objective.** Dissemination information about pilot projects.

**1.4.1. Measure.** Publication in a separate section of the "Infostatyba" information system the information on the construction of energy efficient buildings and installation of engineering systems, as well as the systems using renewable energy.

Prompt dissemination of information on the construction of energy efficient buildings would arouse interest in the requirements for such buildings, would stimulate the demand for acquiring necessary professions and qualifications, it would also increase construction volumes of such buildings. Most suitable for this purpose would be the "Infostatyba" information system, which is used by many construction specialists and additionally the website [www.construction21.eu](http://www.construction21.eu). The preparations for the construction of such buildings would become more active by seeing their construction trends.

**1.4.2. Measure.** Publication of class 'A' energy performance certificates on the SPSC website, distinguishing it from other building's certificates.

All class 'A' energy performance certificates must be distinguished from the list of certificates. It would demonstrate the construction volumes and trends of energy efficient buildings and would help to make faster decisions on the preparation for the construction of such buildings, including training of workers in required professions and qualifications.

**1.5. Objective.** The development of an IS for the implementation of energy efficient solutions.

**1.5.1. Measure.** Publication of information on the construction of energy efficient buildings and the installation of engineering systems and systems using renewable energy in the technology and best practice sections of “www.statybostaisykles.lt” information system. Technology descriptions of at least 3 key parts of a structure related to the increasing of energy performance (facades, windows and doors, roofs, heating and ventilation systems, renewable sources or other) should be provided.

**1.6. Objective.** Increase the construction of energy efficient class A++ buildings.

**1.6.1. Measure.** Include energy performance requirements in the conditions for the design and construction of residential and administrative buildings which are to be constructed using state and municipal funds, earlier than they come into force through the specified implementation stages (STR).

The state and state institutions, in planning the construction of buildings, should take the opportunity to encourage the construction of energy efficient buildings and include as soon as possible the requirement to use state funds only for designing and buildings energy efficient buildings. This would allow the gaining of experience in designing and constructing such buildings, to point out deficiencies of building materials and technologies, as well as workforce qualifications and to develop a demonstration – training base for specialists and workers. Problems encountered would be resolved and the new construction of energy efficient buildings in accordance with the set stages would be smoother.

**1.7. Objective.** To allow for the dissemination of experience in constructing energy efficient buildings for designers, builders, training – qualification improvement institutions

**1.7.1. Measure.** To install energy monitoring systems in state-funded buildings and set monitoring periods

To set out conditions in state-funded and supported buildings projects on how these buildings would be used to verify the implementation of the established requirements, the promotion of the construction of energy efficient buildings and the training and development of construction specialists and workers. These conditions should be set for at least 30 % of state-funded buildings.

**1.8. Objective.** Familiarize citizens with the benefits of energy efficient buildings; teach them how to fully exploit them.

**1.8.1. Measure.** Build only low-energy buildings for social houses.

In order to increase the construction volumes of residential low-energy buildings, it is necessary to gain experience in designing and building energy efficient houses and provide citizens to exploit such houses. At the moment, the construction of low-energy buildings is not an economically attractive area of investment; therefore, the responsibility for fulfilling this objective must be taken by the state. The best way to do this is to build energy efficient buildings for social housing purposes. This would create design and construction base of low-energy buildings, which could later be used by all participants of the construction sector.

**1.9. Objective.** To develop and implement programmes of new and/or modernized buildings, blocks or various other demonstrative projects. This means the implementation of projects with specifications higher than the standard ones, with the aim of testing various new solutions of complex technological, organizational and financial measures.

**1.9.1. Measure.** To develop and implement a demonstrative project programme for the period of years 2014–2020. To provide necessary funding sums ranging from 50% to 80%. To provide additional incentives for international cooperation in implementing projects.

**2. STRATEGIC GOAL:** to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.

**Description of activities:** to adapt the qualification improvement system for the identified working class occupations (adjustment/update of training programmes, quality assurance of non-formal training; training of trainers and preparation of training institutions)

### **Current situation (description of the issues):**

- Market participants understand upcoming changes, yet fail to see the lack of major skills. They subjectively associate the final outcome of the energy performance of the company's building with resources used, rather than the competences of the workers.
- Not all construction companies understand the importance of workers' qualifications and also distrust external trainings and look more favourably at work practice in the buildings. Due to lowest cost practice prevalent in the market and low demand, companies seek to take on qualified workers from other companies, rather than invest in the training of their own employees. Therefore, if the demand for highly-qualified workers in the energy performance field increases significantly, the market may face quality assurance issues.
- Large share of workers seek to gain required skills and knowledge in practical activities from more qualified colleagues.
- Currently, there are three extensive competence descriptions in existing vocational training standards, however, they fail to describe skills related to the construction of low-energy buildings, and the standards have not been updated in accordance with the methodology for the development of the new Vocational Training standard of 2012. Legislative regulation limits the commencement of the update process.
- Formal vocational training programmes do not cover important topics related to energy performance and the construction of low-energy buildings.
- Training of the latest technologies is usually organized by representatives of producers or suppliers in the form of informal sessions, however, not all non-formal vocational training programmes are publicly available, and therefore, it is very difficult to assess the conformity of such training programmes to market needs.
- There is no unified qualification improvement system for VET teachers.
- Both employers and employees value skills gained in existing practices more than they value formal or non-formal training.
- Currently there is only an accreditation and certification system for energy sector employees (installers).
- Training and certification of specialists installing production equipment of renewable energy source has been on-going since 6th September 2012. The procedure for training and certifying specialists installing production equipment of renewable energy sources has been approved.
- Certification of companies is not linked to energy performance of buildings and the use of renewable energy sources, or to qualification quality parameters.

The following objectives and measures are established for this goal:

**2.1. Objective.** To make a revised list of professions related to the construction of low-energy (LE) buildings and the installation of their engineering systems.

**2.1.1. Measure.** To create a list of professions and qualifications necessary for the construction of low-energy buildings subject to stricter requirements.

A unified identification of the main professions related to the construction of low-energy buildings (subject to stricter requirements) would allow for easier identification of special competences of workers who will be constructing LE buildings and installing their engineering systems. The main professions have professional standards and recommended training programmes.

**2.1.2. Measure.** To make a list of special competences for workers who will be constructing LE buildings and installing their engineering systems and assign them to specific qualification levels (link to qualification).

Different qualification levels are linked with different competences necessary for constructing LE buildings and installing their engineering systems.

**2.2. Objective.** To add professions related to the construction of LE buildings to the professions classification.

**2.2.1. Measure.** To analyse current market situation, evaluate EU requirements, and if necessary, propose the description of a missing profession.

Professional associations, by taking into account market demand (employers' requirements) will propose to add new professions to the professions classification, including those related to the construction of LE buildings.

**2.3. Objective.** Move the necessary competency requirements in building regulations and installation instructions.

**2.3.1. Measure.** To specify requirements for the qualifications of workers who will be constructing LE buildings and installing their engineering systems in construction rules and installation instructions.

The identification of necessary competences related to the construction of LE buildings in construction rules and installation instructions would ensure the transfer of quality requirements to the construction site. In the initial stage requirements for workers' competences are specified in:

- Construction rules for furnishing facades;
- Construction rules for installing windows and doors;
- Construction rules for furnishing roofs;
- Instructions for installing heating-ventilation systems;
- Installation rules of system for the use of renewable energy.

**2.4. Objective.** To update current and/or develop new professional standards for related professions by taking into account upcoming changes in construction and energy sectors.

**2.4.1. Measure.** To update descriptions of competences in the developed professional standards of construction, intended for the sector professions related to the construction of LE buildings.

To update descriptions of special competences of current professions necessary for the construction of LE buildings and the installation of their engineering systems, as well as assigning them to a specific qualification level.

**2.4.2. Measure.** To describe in the standard those 'missing professions' related to the construction of energy efficient buildings and the use of renewable energy sources.

By taking into account the implementation requirements for EU directives 2010/31/EU of 19 May 2010 on the energy performance of buildings, Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources and 2006/32/EC of 5 April 2006 on energy end-use efficiency and energy services, as well as changes in the construction and energy sectors related to their implementation, to update current and/or develop new professional standards for professions related to the construction of LE buildings.

**2.5. Objective.** To recommend the introduction of modular training as an effective learning form for improvement of workers qualification who will be constructing LE buildings and installing their engineering systems.

**2.5.1. Measure.** To prepare proposals for the improvement of the description of the professional modular training procedure, to specify and develop comprehensive standards, to develop general modular training programmes for key professions in the approved list of professions in order of priority.

The Regulation Order of the Ministry of Education and Science No. V-1435, dated 27th August "On the approval of the description of the development and validation procedure of formal professional training programmes" provides that all newly developed formal vocational training programmes for acquiring a qualification must be modular.

The principles of a modular professional training system were described by the Qualifications and Vocational Education and Training Development Centre in 2012 in the document on the concept of a modular vocational training system.

The concept of a modular vocational training system states that the division of the qualification acquisition process into modules will increase the flexibility of a vocational training system. It is beneficial for the person pursuing qualification and the labour market, as well as the education system.

The person has more chances to model his qualification independently while acquiring and developing it; to reduce studying period, legitimizing his existing knowledge and competences; to extend his training after a break in another vocational training institution or even another country;

It is easier for employers and labour exchanges to organize training for employees whose qualifications fail to satisfy requirements of existing work places; for employers and professional associations – improvement of employee qualification;

The education system benefits greatly from a well-organized modular professional training: accessibility and attractiveness of professional training increases; the share of young people leaving the education system early decreases; update of professional training programmes and the performance of evaluation and acknowledgement of earlier education become easier. Together this all contributes to the idea of life-long learning.

Transition to modular professional training is consistent with European Union initiatives – “Common European principles for the assessment and validation of non-formal and informal learning” published in 2004, “Recommendation on the development of the European Qualifications Framework (EQF) for lifelong learning” approved by the European Parliament and the Council in 2008, the “European Credit System for Vocational Education and Training (ECVET) (2009) and others.

**2.6. Objective.** To update vocational training programmes for related professions by taking into account upcoming changes in construction and energy sectors.

**2.6.1. Measure.** To update topic lists in training programmes.

Taking into account upcoming changes in construction and energy sectors related to the implementation of EU directives 2010/31/EU of 19 May 2010 on the energy performance of buildings, Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources and 2006/32/EC of 5 April 2006 on energy end-use efficiency and energy services, to adjust existing training programmes to new demands for training and qualification improvement.

**2.7. Objective.** Ensure quality of non-formal adult education.

**2.7.1. Measure.** To supplement the description of measures for ensuring the quality of non-formal adult education.

Measures for quality assurance of non-formal adult education are described in the draft description of quality assurance of a non-formal adult education system, which was prepared by the Education Development Centre under the Ministry of Education and Science in 2012.

**2.7.2. Measure.** To set requirements for the content of vocational training programmes of relevant professions.

Now requirements for non-formal vocational training programmes and their execution can be set by the institution ordering or financing training in accordance with this programme (Art. 12(10) of the Law on Vocational Training of the Republic of Lithuania). Therefore, it is important to submit proposals to change this provision and set common requirements for the content of professional training programmes of relevant professions.

**2.7.3. Measure.** To develop an evaluation methodology for non-formal vocational training programmes, to set requirements for the structure, scope, trainers of the programme.

In order to ensure the quality of non-formal adult education, it is necessary to assess the conformity of non-formal vocational training programmes to set requirements.

**2.7.4. Measure.** To separate the training process from the verification of acquired knowledge and skills.

The training service provision market is being liberalized, therefore, services can be provided by many companies. Knowledge verification in another institution will objectively evaluate training quality.

**2.7.5. Measure.** To perform central verification of theoretical knowledge.

Accessibility of training in pursuance of higher qualification is increased, requirements for knowledge verification are standardized, and reliability of assessment results is increased.

**2.8. Objective.** To improve the readiness of trainers and training institutions for market changes.

**2.8.1. Measure.** Strengthening the relationships with employers and equipment suppliers.



Surveys carried out in the first stage of the project showed that in large companies the installation and implementation of new technologies and solutions is organized and supervised by technology manufacturers or suppliers in the construction site. It allows the improvement of the qualifications of current workers and creates conditions for new knowledge and skills to reach construction locations faster.

**2.8.2. Measure.** Improvement of VET teachers' qualification.

Results of the survey carried out in the first stage of the project showed that 37.8 percent of training institutions' personnel is prepared for training in accordance with the requirements for the achievement of the 2020 targets. It is appropriate to develop training projects of trainers for the training of professional institutions' personnel. For this purpose it is adequate to develop unified training programmes, specify practical training measures and to prepare training material and other measures. Analogous training programmes should also be developed and adjusted for the training of skills of business companies' professionals.

**2.8.3. Measure.** Development of the system for the certification of trainers.

A certification system of trainers would allow the promotion of the improvement of trainers' qualification and strive for high quality of trainings in various training institutions.

**2.8.4. Measure.** Strengthening of relationships between vocational training and higher education (dual training, training of trainers, programme coordination).

Systems for the training and certification of trainers are developed, most advanced professionals are given opportunities for improvement, and higher qualification and the realization of the principles of life-long learning are sought.

**2.8.5. Measure.** To adapt the facilities of sector training centre to the demands in accordance with the updated training programmes.

It is planned that the facilities of training institutions satisfy the latest market demands.

**2.9. Objective.** To legitimize the "Qualification Passport" which specifies topics with tags, proving that the person is qualified to perform the specified works.

**2.9.1. Measure.** The development of a legislative framework for legitimizing the "Qualification Passport" (a level of legitimization is set), as well as development of instructions for filling in and using the 'Passport'.

The aim is to have a unified document in the future which would show the professional competences and the qualification of its owner (worker). An implemented example – a certificate confirming the knowledge of the qualified installer issued for installers who have completed the training programme in the National Training Centre for Energy Specialists, as well as a personal "Qualification passport" which specifies topics with tags proving that the person is qualified to perform the specified works. It is suggested to assign the creation of a qualification passport to professional associations of the respective fields.

**3. STRATEGIC GOAL:** to implement the updated training system by ensuring the necessary number of qualified workers for the achievement of the 2020 targets.

**Activities:** the implementation of the training system which would allow the preparation of qualified workers for the achievement of the 2020 targets.

#### **Current situation (description of the issue):**

- Workers in the labour market in the construction field lack knowledge and skills related to the construction of energy efficient buildings and the installation of technological equipment for renewable energy sources.
- The achievement of the 2020 targets will require additional training for most of current workers by providing them with the lacking knowledge and skills;
- The transfer of these lacking knowledge and skills requires the use of updated or newly developed training programmes, additional training of trainers, an update of the training base, close cooperation between training institutions and construction and equipment installation companies, suppliers, professional associations, higher education institutions.

The following objectives and measures are established for this goal:

**3.1. Objective.** Opportunities for increasing the attractiveness of construction worker's and energy specialist's professions.

**3.1.1. Measure.** Planning of construction volumes with the aim of increasing the attractiveness of the construction worker's profession (information on the perspectives of workforce demand).

An important precondition for increasing the attractiveness of the construction worker's profession is the improvement of employment prospects. Accessible information on development plans of the construction sector helps people to decide to select the construction worker's profession (retrain) in the hope of easier employment conditions in the future. The fact that market changes influence professional orientation can be confirmed by most training institutions, however, these provisions can also be changed by publishing perspective plans for construction development. These are strategic governmental and municipal plans which provide forecasts for the construction sector, renovation of buildings, and construction development of the housing stock.

**3.1.2. Measure.** Vocational training prestige is increased by specifying the compliance of acquired professional qualifications to the 2020 targets and objectives.

The prestige of a profession can be changed by forming a certain image. A construction worker's job can be presented not only as hard and dangerous, but also as interesting, creative, as a job with the latest technologies, tools, materials and well-paid. The links between the construction worker's profession with the construction of energy efficient, low-energy buildings, renewable energy, automation of engineering systems, can increase the prestige of these professions and encourage more people to seek the respective qualifications. Energy equipment is increasingly more related to the use of software and automation. Merely mentioning renewable energy in the title of training programmes can arouse interest in the respective profession.

**3.2. Objective.** Training of new workers in accordance with updated programmes.

**3.2.1. Measure.** Training of employees uses initial vocational training programmes updated in accordance with the 2020 targets and objectives.

It is important that the most promptly updated training programmes are used for training of workers and that graduates of vocational training institutions will not be forced to start improving their qualifications right away due to the fact initial vocational training fails to keep up with market demands. It is important that organizational reforms of vocational training are implemented as soon as possible, legal issues related to the development of training programmes are resolved, and that closer cooperation between training institutions and business companies, as well as professional associations is achieved.

**3.2.2. Measure.** The use of apprenticeship for the training of new workers in lacking qualifications by using best practices.

Construction companies and training institutions admit that the use of apprenticeship for vocational training and qualification improvement of workers is a good form of training; however, its use should be better defined and organized. It is important that students receive appropriate knowledge via the apprenticeship method. Practical training should be organized by 'first training' trainers in order for the practical experience acquired by students to be consistent with theoretical teachings and to avoid burdening the examination of practical and theoretical knowledge (examinations). Only those companies should be involved in apprenticeship which themselves have large practical experience in the construction of energy efficient buildings and the use of renewable energy sources.

**3.3. Objective.** Qualification improvement of workforce.

**3.3.1. Measure.** To use formal and recognized non-formal training programmes for continuous training, providing the lacking knowledge and skills for the construction of energy efficient buildings and the installation of technological equipment for the use of renewable energy.

To use training programmes updated in accordance with the demands for the construction of energy efficient buildings and the development demands for renewable energy for the qualification improvement of workers with the aim of better satisfying the increasing demand for qualified workers for the achievement of the 2020 targets.

Most new building materials and technologies in Lithuania are installed via non-formal training, when suppliers or manufacturers introducing their products to the market train workers in the sector of construction and renewable energy to use these products properly. Often non-formal training becomes the main qualification improvement, since it is flexible and quick to fill in qualifications gaps. Recognition and quality assurance of such training most often happen on the basis of mutual respect between the clients (most often construction companies) and the service provider (most often providers of materials, equipment and technologies or their representatives). In order for this training to be widely recognized (for example, in order for them to be trusted by construction companies that are not familiar with the service provider and have no contact with it) it should be subject to certain requirements, and it should be evaluated in accordance with the specified methodologies.

**3.3.2. Measure.** Together with business associations, higher schools and qualification improvement institutions to prepare and implement workforce qualification improvement projects.

According to the "Status Quo" analysis results, it can be seen that the market is slow in reacting to the demand to improve workers' qualifications in pursuance of the 2020 targets for the construction of energy efficient buildings and the development of renewable energy. Therefore, it is important to develop and implement targeted workforce qualification improvement projects, which would develop new or update training programmes of vocational training institutions and implement pilot training of the workforce. The development of training programmes would involve using higher school personnel qualifications, knowledge of business associations on the matters of market demand and the experience and a basis of vocational training institutions. The results of these projects would be an encouragement for vocational training institutions to get involved in the workforce qualification improvement process.

**3.4. Objective.** Retraining of the unemployed.

**3.4.1. Measure.** To evolve a programme intended for the achievement of the 2020 targets in the retraining of workers offered by the labour exchange.

Retraining of workers has to be offered to other professions in the sectors of construction and renewable energy related to the achievement of the 2020 targets as well as training programmes updated for the training of the unemployed. This would also increase the number of workers satisfying market demands.

**3.5. Objective.** Training of trainers

**3.5.1. Measure.** Together with business associations, higher schools and qualification improvement institutions to prepare and implement trainer training projects.

Training of trainers is necessary for the qualification improvement of workers in the construction sector and related professions, since only the qualified personnel of vocational training institutions can prepare workers suitable for the achievement of the goals set out in this roadmap. It is adequate to develop and implement trainer training projects for the qualification improvement of trainers of vocational training institutions, which would develop training programmes, set out requirements for teachers and train sufficient number of qualified teachers. Such projects would use the qualifications of the teaching personnel of higher schools, knowledge of business associations on the matters of market demands and the experience and facilities of vocational training institutions in order to implement project outcomes.

### 3.3. Development of quality assurance and a qualifications database

**4. STRATEGIC GOAL:** to ensure both accessibility and a monitoring option of the latest information on professional standards, programmes, workers' qualifications, certification of workers, and certification of companies for the stakeholders in pursuance of higher quality of training and works.

**Activities:** development of an information system: workers' qualifications; certification of workers; certification of companies; companies' experience in constructing energy efficient

buildings and installing systems for the use of renewable energy sources, improvement of the monitoring system (monitoring of indicators of the vocational training system; monitoring of the labour market (monitoring of lacking professional qualifications); monitoring of workforce migration; control system; development of models of recommended salary systems and various information systems for workers in the construction sector.

**Current situation (description of the issue):**

- No unified list of professions and qualifications used by stakeholders;
- Information on programmes and training standards is published late on the Internet;
- Formal training data is not always collated;
- Different institutions and organizations develop different certification procedures for workers and engineers, a unified certification system is not being developed;
- Some professions have certification procedures and responsible institutions;
- Monitoring of indicators of non-formal vocational training is not being performed;
- Monitoring of indicators of the vocational training system is insufficient and includes only very generalized education indicators;
- Demand for workers is determined according to existing market requirements, without considering possible technological advancements and the creation of new professions.

The following objectives and measures are established for this goal:

**4.1. Objective.** To ensure availability of information on the supply of information on non-formal training.

Measures for this objective are divided into two parts. The first part is intended for the improvement and development of existing measures, the second part includes new methods of information also encouraging information storage in databases.

**4.1.1. Measure.** To create an opportunity for free publication of information on non-formal training.

To add data on non-formal adult education in the Education ITC formal training register (lists of institutions, scopes of theoretical and practical parts, data card of the person who has acquired the competence.)

**4.1.2. Measure.** To encourage to upload of non-formal training programmes to information databases.

The objective of this measure - to publish and promote training programmes of training institutions. Since this information can be uploaded for free, it can also be considered supplementary promotion of training institutions.

**4.2. Objective.** To develop an information database of formal/non-formal vocational training of workers in the sectors of construction and the use of renewable energy equipment.

**4.2. Measure.** To update and supplement the vocational training methodology and set out requirements of the information system.

The purpose of this measure is to supplement the methodology, expand the information system of workers' qualifications, and develop additional instructions and rules for the assessment and publication of formal/non formal training.

**4.3. Objective.** To improve the vocational training monitoring system.

**4.3.1. Measure.** To improve existing assessment indicators of the vocational training system, by ensuring assessment of qualitative training changes and the ranking of training institutions.

By 2015 to develop a new list of indicators by including non-formal training, assessment and acknowledgement of training outcomes.

**4.3.2. Measure.** To introduce new information assessment methods and processing tools, by ensuring prompt changes in treatment and methods. To update the methodology for vocational training system indicators and monitoring.

**4.4. Objective.** To raise quality of qualification improvement.

**4.4.1. Measure.** To develop roadmap for the national certification system.

According to the approved initial list of qualifications/works requiring certification, to develop a procedure for selecting professions to be certified, by associating certification with a specific job.

To update the certification system of companies and supplement it with qualification requirements for workers and specialists according to relevant construction activities.

**4.4.2. Measure.** To specify qualification requirements for contractors in construction and the installation of renewable energy equipment responsible for the quality of works; to assign institutions certifying workers in professions specified in the list by providing an opportunity for employers (members of professional associations) and to participate in examining and certifying workers.

**4.5. Objective.** To carry out monitoring of demand for qualifications in the labour market and the quality of qualification improvement .

**4.5.1. Measure.** In improving quality monitoring, specialized periodic surveys should be carried out, by dividing them according to requirements and the demand of the labour market:

- 1) In finding out and comparing opinions of training institutions/associations and graduates;
- 2) In identifying the lack of qualifications for workers of professional associations in the labour market, free and occupied positions and qualification improvement quality.

**4.6. Objective.** Identification of trends for the demand for workers and their qualifications in the market.

**4.6.1. Measure.** To evaluate trends in respect of new technologies and professions, necessary for their installation.

To develop an intelligent market monitoring system for assessing the dynamics and the nature of the demand for professions and qualifications, to forecast the demand for possible professions and develop workers with the necessary qualification in time.

**4.7. Objective. To develop and install systems, including remuneration systems, for the acquisition and promotion of necessary qualifications.**

**4.7.1. Measure.** To develop roadmap for the recommended system of remuneration according to qualifications, which could be used by construction, and energy companies to set salaries of their workers.

**4.8. Objective.** The development of the "Electronic identification cards", and "Qualification passport" information system.

**4.8.1. Measure.** To develop and install the "Electronic identification cards" information system for construction workers. By using experience and demands of existing companies, to develop standards and a reference model for the recommended IS.

**4.8.2. Measure.** To develop and install the "Qualification passport" information system for construction workers by including experience of existing companies (REMC) and ensuring availability of information on worker's qualifications.

### 3.4. Model for implementation of the qualification and training schemes

A summary of objectives and measures of the qualification improvement system in pursuance of the 2020 targets for increasing energy performance of buildings and the use of renewable energy in buildings is provided in Table 3.1.

Table 3.1. A summary of objectives and measures of the qualification improvement system in pursuance of the 2020 targets for increasing energy performance of buildings and the use of renewable energy in buildings

<b>1. Strategic goal:</b> to increase demand for knowledge of and skills in energy performance of buildings for participants of the construction sector on the grounds of requirements of European Union directives, economic benefits, the importance of environmental protection and energy self-sufficiency of the country.				
<b>1. Activities: Dissemination of information on the 2020 targets in respect of reduction of energy consumption in the construction sector, opportunities for efficient use of energy in buildings and the importance of the use of renewable energy sources.</b>				
<b>Objectives</b>	<b>Measures</b>			
<b>Objectives</b>	<b>Physical implementation indicators</b>			
<b>Objectives</b>	<b>Period</b>			
<b>Objectives</b>	<b>Funding</b>			
1.1. Publication of implementation stages of measures for increasing energy efficiency, set out in legal acts, on the websites of during seminars organized by responsible institutions	1.1.1. Development of a legal act of the Government of the Republic of Lithuania (LRG): The creation of an information section on the necessity, goals and implementation stages of EPBD on the websites of AM, ŠMM, ŪM, EM and their subordinate institutions (public enterprises), which are updated at least bi-annually.	From 01/01/2014 to 2020.	AM; ŠMM; ŪM; EM and their subordinate institutions (public enterprises)	Funds of the Ministries and their subordinate institutions
1.1. Publication of implementation stages of measures for increasing energy efficiency, set out in legal acts, on the websites of during seminars organized by responsible institutions	1.1.1. Organization of information seminars on EPBD targets and their implementation stages and achievement.	From 01/01/2014 to 2020.	AM; ŠMM; ŪM; EM and their subordinate institutions (public enterprises)	Funds of the ministries and their subordinate institutions
1.2. Promotion of the process and the merits of increasing energy performance in the professional associations' information systems and their qualification improvement and certification training of specialists.	1.2.1. Creating an information section on the achievement of the goals of the EPBD requirements and their benefits on LSA, LSIS and other professional associations' websites, updated bi-annually. To develop cooperation with the Lithuanian Academy of Sciences (for example, by including a link on the associations' websites to the issue of "The Third Industrial Revolution".	2014- 2020	Professional associations	Funds of professional associations

<b>1. Strategic goal:</b> to increase demand for knowledge of and skills in energy performance of buildings for participants of the construction sector on the grounds of requirements of European Union directives, economic benefits, the importance of environmental protection and energy self-sufficiency of the country.			
1.2. Promotion of the process and the merits of increasing energy performance in the professional associations' information systems and their qualification improvement and certification training of specialists.	1.2.2. Addition of information sessions on the EPBD requirements and their economic and environmental protection benefits to the certification and qualification improvement programmes of construction engineers.	No less than 2 hour lecture in the certification and qualification improvement programme approved by the Ministry of Environment; Include in the programme a mandatory introduction to the increasing of energy performance of buildings and the specifications and news on the installation of renewable energy source technologies in LE buildings.	Until 2016 Divisions of professional associations, training providers Funds of the professional associations, providers of training courses
1.3. Publication of the preparations of vocational training institutions to train workers for the construction of energy efficient buildings.	1.3.1. Introduction of the preparations to develop new working class occupations and qualifications in educational exhibitions Organization of competitions of young construction workers in Lithuania and participation in EuroSkills and World Skills competitions.	No less than once a year: In construction exhibition "Resta", In education exhibition "Mokykla",	2014.-2018 Vocational training institutions, SMM, SADM, LSA and other professional associations (organization of competitions) Funds of the vocational training institutions and the ministries
1.3. Publication of the preparations of vocational training institutions to train workers for the construction of energy efficient buildings.	1.3.2. Development and dissemination of information on training and qualification improvement programmes for new working class occupations via professional associations.	No less than 1 issue/leaflet for a vocational training institution, updated no less than every 2 years	2014.-2018 Vocational training institutions Funds of the vocational training institutions
1.3. Publication of the preparations of vocational training institutions to train workers for the construction of energy efficient buildings.	1.3.3. Addition of new working class occupations and qualifications to the labour exchange information system by specifying training institutions.	Supplementation of the information system – 1 a year.	2014.-2018 Vocational training institutions of the Lithuanian Labour Exchange under the SADM Funds of the Lithuanian Labour Exchange under the SADM

**1. Strategic goal:** to increase demand for knowledge of and skills in energy performance of buildings for participants of the construction sector on the grounds of requirements of European Union directives, economic benefits, the importance of environmental protection and energy self-sufficiency of the country.

1.4. Dissemination of information on pilot projects	1.4.1. Publication of information on the construction of energy efficient buildings and the installation of engineering systems and systems using renewable energy in a separate section of "Infostatyba" information system.	IS "Infostatyba" must publish distinguished information on no less than 90 percent of energy efficient buildings under construction.	Information on: A, A+, A++ buildings – since 2014 A+ and A++ buildings only – since 2016 A++ buildings only – since 2018	State Territorial Planning and Construction Inspectorate under the AM	Funds of the State Territorial Planning and Construction Inspectorate under the AM
1.4. Dissemination of information on pilot projects	1.4.2. Publication of class A energy performance certificates on the SPSC website, distinguishing it from other buildings certificates.	A separate list of all certified class A buildings is made	Information on: A, A+, A++ buildings – since 2014 A+ and A++ buildings only – since 2016 A++ buildings only – since 2018	SPSC	SPSC
1.4. Dissemination of information on pilot projects	1.4.3. Publication of information on the construction of energy efficient buildings and the installation of engineering systems and systems using renewable energy on „www.construction21.eu “.	Updated no less than every three months	Since 2014	VGTU with business associations	VGTU with business associations EU project funds
1.5. The development of an IS for the implementation of energy efficient solutions.	1.5.1. Publication of information on the construction of energy efficient buildings and the installation of engineering systems and systems using renewable energy in the technology and best practice sections of „www.statybostaisykles.lt“ information system.	Technology descriptions of at least 3 key parts of a structure related to the increasing of energy performance (facades, windows and doors, roofs, heating and ventilation systems, renewable sources or other) provided in the technologies section of the <a href="http://www.statybostaisykles.lt">www.statybostaisykles.lt</a> information system	2014- 2020	LSA with partners	Funds of the state, professional associations, business companies and EU support.



<p><b>1. Strategic goal:</b> to increase demand for knowledge of and skills in energy performance of buildings for participants of the construction sector on the grounds of requirements of European Union directives, economic benefits, the importance of environmental protection and energy self-sufficiency of the country.</p>			
<p>1.6. Increase the construction of energy efficient class A++ buildings.</p>	<p>1.6.1. Include energy performance requirements in the conditions for the design and construction of residential and administrative buildings, to be constructed using state and municipal funds, earlier than they come into force through the specified implementation stages (STR).</p>	<p>Changes in the specifications</p>	<p>Since 2014</p> <p>Funds of the state and the municipalities</p>
<p>1.7. To allow for the dissemination of experience in constructing energy efficient buildings for designers, builders, training – qualification improvement institutions</p>	<p>1.7.1. To install energy monitoring systems in state-funded buildings and set monitoring periods</p> <p>To define conditions for the dissemination of information and training of specialists for the use of such buildings</p>	<p>No less than 30% of state-funded buildings</p>	<p>Since 2015</p> <p>Funds of the state and of the municipalities (agencies, centres and other), municipalities</p>
<p>1.8. Familiarize citizens with the benefits of energy efficient buildings; teach them how to fully exploit them.</p>	<p>1.8.1. Build only low-energy buildings for social houses.</p>	<p>Changes in the specifications</p>	<p>Since 2015</p> <p>Funds of the state and the municipalities, their subordinate institutions-agencies</p>
<p><b>2. Strategic goal:</b> to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.</p>			
<p><b>2. Activities:</b> to adapt the qualification improvement system for the identified working class occupations (adjustment/update of training programmes, quality assurance of non-formal training; training of trainers and preparation of training institutions)</p>			
<b>Objectives</b>	<b>Measures</b>	<b>Physical implementation indicators</b>	<b>Period</b>
<p>2.1. Make a list of professions related to the construction of low-energy (LE) buildings and the installation of their engineering systems, as well as clarify the competences necessary for these professions-</p>	<p>2.1.1. Make a list of works related to the construction of low-energy buildings subject to stricter requirements</p>	<p>The list is made</p>	<p>2014</p>
			<p>Professional associations, KPMPC, Professional Committee of Construction and Architecture</p> <p>KPMPC, professional associations</p>

**2. Strategic goal:** to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.

<p>2.1. Make a list of professions related to the construction of low-energy (LE) buildings and the installation of their engineering systems, as well as clarify the competences necessary for these professions</p> <p>2.2. To add professions related to the construction of LE buildings to the professions classification</p>	<p>2.1.2. To make a list of special competences for workers who will be constructing LE buildings and installing their engineering systems and assign them to specific qualification levels (link to qualification).</p> <p>2.2.1. To analyse current situation in the market, evaluate EU requirements, if necessary, to propose a description of a missing profession.</p>	<p>The list is made</p> <p>2015</p>	<p>Professional associations, KPMPC, Professional Committee of Construction and Architecture</p> <p>KPMPC, professional associations</p>
<p>2.3. To transfer the requirement for necessary competences to construction rules and installation instructions.</p>	<p>2.3.1. To specify requirements for the qualifications of workers who will be constructing LE buildings and installing their engineering systems in construction rules and installation instructions.</p>	<p>At least 5 sets of construction/installation rules or instructions developed for each field (e.g. facades, windows, roofs, heating - ventilation systems, renewable energy source system, etc.)</p> <p>2015</p>	<p>Professional associations</p> <p>Professional associations</p>
<p>2.4. To update current and/ or develop new professional standards for related professions by taking into account upcoming changes in construction and energy sectors.</p>	<p>2.4.1. To update descriptions of competences in the developed professional standards of construction, which is intended for construction sector professions related to the construction of LE buildings.</p> <p>2.4.2. To describe in the standard missing professions related to the construction of energy efficient buildings and the use of renewable energy sources.</p>	<p>A new professional standard for construction prepared, descriptions of competences for professions updated.</p> <p>Missing professions related to the construction of energy efficient buildings described</p>	<p>III quarter of 2014</p> <p>The standard is to be developed experts in the sector hired by the KPMPC on the proposal of professional associations, separate companies and institutions. Evaluated by experts assigned by professional associations.</p> <p>Approved by the professional committee of the sector</p> <p>ŠMM</p>

<b>2. Strategic goal:</b> to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.			
2.5. To recommend the introduction of modular training as an effective learning form for qualification improvement of workers who will be constructing LE buildings and installing their engineering systems.	2.5.1. To prepare proposals for the description of the professional modular training procedure; Develop unified modular training programmes for key professions.	2016 Proposals for the description of the modular training procedure; No less than 3 modular training programmes for key professions aligned with business developed.	Prepared by sector experts hired by the KPMPC for the professions approved by the sector committee and relevant professional associations. Evaluated by experts assigned by professional associations. Approved by the professional committee of the sector and the relevant professional association. Business associations, vocational training institutions.
2.6. To update vocational training programmes for related professions by taking into account upcoming changes in construction and energy sectors.	2.6.1. To update topic lists in formal vocational training programmes. Adapt the programme to modular training.	2016 2_Existing formal vocational training programmes updated (70%)	Providers of vocational training together with business associations Funds of the ŠMM, vocational training institutions
2.7. Ensure quality of non-formal adult education.	2.7.1. To describe measures for ensuring quality assurance of non-formal adult education.	2014 The description of quality assurance of non-formal adult education system approved	ŠMM, business associations, vocational training institutions ŠMM

**2. Strategic goal:** to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.

2.7. Ensure quality of non-formal adult education.	2.7.2. To set requirements for the content of vocational training programmes of relevant professions.	Requirements set 2016 To provide an opportunity to develop new or update existing training programmes not only in accordance with the developed and approved professional standards. Also to require that new or updated training programmes are mandatory to coordinate with and be approved by professional associations in the relevant field.	ŠMM, business associations, vocational training institutions	ŠMM
2.7. Ensure quality of non-formal adult education.	2.7.3. To develop a methodology for the evaluation of non-formal vocational training programmes, set requirements for the structure, scope and the trainers of the programme, as well as establish the procedure for competence evaluation and certification of organizations providing qualifications.	Methodology developed 2015 and implemented (1 unit)	ŠMM, KPMPK, professional and other associations, the central and sectoral professional committees; vocational training institutions	ŠMM
2.7. Ensure quality of non-formal adult education.	2.7.4. To separate the training process from the verification of acquired knowledge and skills.	Examination system of knowledge and practical skills developed	ŠMM	ŠMM

<b>2. Strategic goal:</b> to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.				
2.7. Ensure quality of non-formal adult education.	2.7.5. To perform central verification of theoretical knowledge.	To install an electronic knowledge examination system	2016	ŠMM, professional and other associations, training institutions ŠMM
2.8. To improve the readiness of trainers and training institutions for market changes.	2.8.1. Strengthening the relationships with employers and equipment suppliers.	Partnership/cooperation agreements signed between vocational training institutions and companies (number)	2018	Vocational training institutions, professional associations and business companies Vocational training institutions, business
2.8. To improve the readiness of trainers and training institutions for market changes.	2.8.2. Improvement of VET teachers' qualification Improvement of skilled workers' qualification of business companies engaged in non-formal training	Number of trainers trained	2018	Vocational training institutions, professional associations and business companies ŠMM, Vocational training institutions, business
2.8. To improve the readiness of trainers and training institutions for market changes.	2.8.3. Development of the system for the certification of trainers	Active certification system of trainers	2018	Vocational training institutions, professional associations ŠMM
2.8. To improve the readiness of trainers and training institutions for market changes.	2.8.4. Strengthening of relationships between vocational training and higher education (dual training, training of trainers, programme coordination).	Joint projects of quality improvement of higher education and vocational training are being carried out (number). No less than 2 projects completed	2018	Vocational training institutions, higher education institutions, business associations, business companies ŠMM, EU project funds

**2. Strategic goal:** to boost the qualification improvement system of working class occupations to new market demands by ensuring the transfer of new knowledge and skills needed for the achievement of the 2020 targets to the labour market.

2.8. To improve the readiness of trainers and training institutions for market changes.	2.8.5. To adapt the facilities of sectoral training centres to the demands in accordance with the updated training programmes.	An upgraded facility of sectorial training centres (units of equipment).	2018	Vocational training institutions	ŠMM, EU project funds
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2.9. To legitimize the "Qualification Passport" which specifies topics with tags, proving that the person is qualified to perform the specified works.	2.9.1. The development of a legislative framework for legitimizing the "Qualification Passport" (a level of legitimization is set), as well as development of instructions for filling in and using.	The specified measures implemented	II quarter of 2015	KPMPC, professional associations	ŠMM
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**3. Strategic goal:** to implement and updated training system, ensuring the required number of qualified specialists and workers necessary for the achievement of the 2020 targets.

**3. Activities:** The implementation of the training system which would allow the preparation of qualified workers for the achievement of the 2020 targets.

<b>Objectives</b>	<b>Measures</b>	<b>Physical implementation indicators</b>	<b>Period</b>	<b>Responsible institution</b>	<b>Funding</b>
3.1. Increasing attractiveness of the construction sector and related professions	3.1.1. Planning of public institutions' construction volumes with the aim of increasing the attractiveness of the construction worker's profession (information on the perspectives of workforce demand).	Strategic plans of the government and municipalities, forecast of the development of the dwelling stock	2015	The government, municipalities, LNTPA	The government, municipalities, LNTPA
3.1. Increasing attractiveness of the construction sector and related professions	3.1.2. Vocational training prestige is increased by specifying the compliance of acquired professional qualifications to the 2020 targets and objectives.	Information published on the websites of training institutions and business organizations, also in educational and other exhibitions	2015	Vocational training institutions, Professional associations	Vocational training institutions

<b>3. Strategic goal:</b> to implement and updated training system, ensuring the required number of qualified specialists and workers necessary for the achievement of the 2020 targets.				
3.2. Training of new workers in accordance with updated programmes.	3.2.1. Initial vocational training programmes used for training workers updated in accordance with the 2020 targets and objectives	More than 60 % of workers trained under the new programmes by 2016 More than 80 % of workers trained under the new programmes by 2018	2018	Training institutions, professional associations and business companies ŠMM
3.2. Training of new workers in accordance with updated programmes.	3.2.2. The use of apprenticeship for the training of new workers in lacking qualifications by using best practices.	The number of workers trained by using the apprenticeship method: - by 2016 no less than 100 - by 2018 no less than 200	2018	Training institutions, professional associations and business companies ŠMM Business organizations
3.3. Qualification improvement of workforce	3.3.1. To use formal and recognized non-formal training programmes for continuous training, providing lacking knowledge and skills for the construction of energy efficient buildings and the use of renewable energy sources	The number of trained workers: - by 2016 no less than 4000 - by 2018 no less than 10000	2018	Professional associations, business companies, training institutions Businesses; ŠMM
3.3. Qualification improvement of workforce	3.3.2. Together with business associations, higher schools and qualification improvement institutions to prepare and implement workforce qualification improvement projects.	No less than 3 projects completed	2018	Business associations, higher schools, vocational training institutions EU funds, national funds, funds of business associations, higher schools, vocational training institutions
3.4. Retraining of the unemployed	3.4.1. To involve programme intended for the achievement of the 2020 targets in the retraining of workers offered by the labour exchange	The number of trained workers: - by 2016 no less than 50 % - by 2018 no less than 80 %	2018	Labour Exchange; Training organizations, professional associations

**3. Strategic goal:** to implement and updated training system, ensuring the required number of qualified specialists and workers necessary for the achievement of the 2020 targets.

3.5. Training of trainers	3.5.1. Together with business associations, higher schools and qualification improvement institutions to prepare and implement trainer training projects	No less than 3 projects completed	2018	Business associations, higher schools, vocational training institutions	EU funds, national funds, funds of business associations, higher schools, vocational training institutions
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**4. Strategic goal:** To ensure accessibility and monitoring option of latest information on professional standards, programmes, workers' qualifications, certification of workers, and certification of companies for the stakeholders.

**4. Activities:** Development of an information system: workers' qualifications; certification of workers; certification of companies; companies' experience in constructing energy efficient buildings and installing systems for the use of renewable energy sources, improvement of the monitoring system (monitoring of indicators of the vocational training system; monitoring of the labour market (monitoring of lacking professional qualifications); monitoring of workforce migration); control system.

Objectives	Measures	Physical implementation indicators	Period	Responsible institution	Funding
4.1 Ensure that information on the supply of non-formal training is accessible	4.1.1. To create an opportunity for free publication of information on non-formal training.	Develop a new or update existing online information databases of the Education ITC, training organizations, business organizations (without registration fee)	Until 2015	Labour exchange, KPMPC, training institutions, Infostatyba, business organizations	ŠMM, training organizations, professional associations.
4.1 Ensure that information on the supply of non-formal training is accessible	4.1.2. To encourage to upload of non-formal training programmes to information databases (promotion, recognition)	Links on no less than 5 stakeholder organizations' websites	Until 2016	Labour exchange, KPMPC, training institutions, Infostatyba	Labour exchange, KPMPC, training institutions
4.2 To develop an information system on the formal/non-formal vocational training of construction workers	4.2.1. To update and supplement the methodology and set out requirements for the system.	Supplemented methodology, extended information system of workers' qualifications, additional instructions developed, rules for evaluating and publishing formal/non-formal trainings.	Until 2017	ŠMM, professional associations, SPSC, AM	EU support, funds of the ministries.



<b>4. Strategic goal:</b> To ensure accessibility and monitoring option of latest information on professional standards, programmes, workers' qualifications, certification of workers, and certification of companies for the stakeholders.			
4.3 To improve the vocational training monitoring system.	4.3.1. To improve existing assessment indicators of the vocational training system, by ensuring assessment of qualitative training changes and the ranking of training institutions.	A list of evaluation indicators	Until 2015 ŠMM, training institutions, professional associations. EU, ministry funds
4.3 To improve the vocational training monitoring system.	4.3.2. To introduce new assessment methods and tools for faster processing of information, by ensuring prompt changes in treatment and methods.	An updated methodology for vocational training system indicators and monitoring.	Until 2017 ŠMM, training institutions, professional associations. EU, ministry funds
4.4 To raise quality of qualification improvement.	4.4.1. To develop roadmap for the national certification system.  To develop an initial list of qualifications/works requiring certification, to develop a procedure for selecting professions to be certified, by associating certification with specifics jobs.  To update the certification system of companies and supplement it with qualification requirements for workers and specialists according to relevant construction activities.	A project of the National Certification System;  A list of qualifications/jobs requiring certification	Until 2015 ŠMM, KPMP, training institutions, professional associations. EU, ministry funds, other responsible institution
4.4 To raise quality of qualification improvement.	4.4.2. To specify qualification requirements for contractors in construction and the installation of renewable energy equipment responsible for the quality of works; to assign institutions certifying workers in professions specified in the list by providing an opportunity for employers (members of professional associations) to participate in examining and certifying workers.	A regulation with qualification requirements;  A list of institutions assigned for certification and professions	Until 2015 AM, ŠMM, training institutions, SPSC, professional associations. EU, ministries' funds, other responsible institution

**4. Strategic goal:** To ensure accessibility and monitoring option of latest information on professional standards; programmes, workers' qualifications, certification of workers, and certification of companies for the stakeholders.

4.5 To carry out monitoring of demand for qualifications in the labour market and the quality of qualification improvement.	4.5.1. Specialized periodic surveys: 1) of training institutions and graduates; 2) of companies of professional associations	Surveys developed and carried out, units per year, no less than 1 for each subject, by providing evaluation of survey results and conclusions	Until 2015	ŠMM, ŠITC, training institutions, SPSC, professional associations.	EU, ŠMM, training organizations, professional associations, SPSC
4.6 Identification of trends of demand for a qualification and workforce	4.6.1. Evaluate trends of relevant new technologies and professions	Intelligent monitoring system	Until 2017	ŠMM, AM, UAB Sistela, KTU, VGTU, ŪM, Labour Exchange, SPSC	Funds of the ministries, the EU
4.7 Adequate remuneration system according to qualifications	4.7.1. To develop roadmap for the recommended remuneration system according to qualifications	Recommended remuneration system	Until 2017	Professional associations, UAB Sistela	Professional associations
4.8 "Electronic identification cards for workers" and "Qualification passport" information systems	4.8.1. To develop and install the "Electronic identification cards" information system for workers in the construction sector	"Electronic identification cards" and "Qualification passport" information systems	Until 2017	Professional associations, SPSC	EU, ministry's funds, professional associations
4.8 "Electronic identification cards for workers" and "Qualification passport" information systems	4.8.2. To develop and install the "Qualification Passport" information system for workers in the construction sector To coordinate with the "Electronic Identification Cards for Workers" system.	"Qualification Passport" information system	Until 2017	AM, ŠMM, training institutions, professional associations, SPSC	EU, ministry's funds, professional associations

# 4.



## CONCLUSIONS

In order to improve energy performance of buildings in accordance with the requirements of the Directive **2010/31/ES** on energy performance of buildings, provisions were approved by Lithuanian legal acts stating that as of 2020 heat losses through envelopes of buildings designed and constructed in Lithuania should be twice as low as compared to the buildings constructed at present. Heat losses of these buildings due to infiltration will be very low, since strict requirements are specified for their sealing; the fulfilment of these requirements will be verified by measurements following the completion of construction works. Some of the energy used in the building will be produced within or outside the building by using technologies equipment for energy production from renewable energy sources. It is provided that by 2020 renewable energy sources will account for no less than 23 % of total energy consumption.

In accordance with the "Status Quo" analysis results and by taking into account the new requirements for the construction of energy efficient buildings, main strategic goals and measures for qualification improvement of workers are specified in this roadmap, providing that energy efficient buildings are constructed and renewable energy sources are used as of 2020. The main activities of qualification improvement will be assigned to vocational training institutions, which can prepare qualification improvement programmes and additionally train workers, i.e. to prepare them for the construction of energy efficient buildings and installation of equipment for the production of energy of renewable energy sources. For this purpose, the potential of non-formal vocational training should also be used by defining qualitative requirements for such training. Initial vocational training also needs the most prompt update of training programmes possible together with improvement of trainers' qualification, so that graduates are prepared for the latest changes in building materials, technologies and equipment. The intensification of these processes requires information dissemination, since information on expected changes and new requirements motivates all participants of the construction sector to improve their qualifications. Motivation for qualification improvement and its quality assurance require an information system with registers for qualification improvement, certification, requirements, monitoring, which would facilitate market conditions for higher-qualification workers.

Preparation of this roadmap involved analysing funding matters of the implementation of the specified measures. The summary of the goals and implementation measures of the roadmap specifies institutions responsible for the implementation of these measures and possible sources of funding. All institutions interested in the improvement of workers' qualification in the sectors of construction and the use of renewable energy in buildings, in developing their long-term and short-term plans, budgets and projects, are invited to assess their potential and demands and integrate the measures set out in this roadmap in them. In order to implement the measures specified in the roadmap and to achieve the common goals – be prepared to construct energy efficient buildings as of 2020 – it is suggested to merge organizational and financial resources of several institutions and develop and implement joint projects.



## ENDORSEMENT

Representatives of the following institutions were familiarized with the *Roadmap for Qualification improvement of Lithuanian Construction Sector Workers in Pursuance of the 2020 Energy Performance Targets* and agreed to the measures specified in the roadmap to ensure the readiness of construction workers to reduce energy consumption in buildings and increase the use of energy from renewable resources, support the implementation initiative of this roadmap and expressed interest and readiness to implement the measures specified in the roadmap and contribute to the dissemination of information provided in the roadmap to stakeholders:

- Public Enterprise Certification Centre of Building Products;
- Lithuanian Builders Association;
- Vilnius Gediminas Technical University;
- Faculty of Civil Engineering and Architecture of Kaunas University of Technology;
- Regional Innovations Management Centre;
- Ministry of Social Security and Labour of the Republic of Lithuania;
- Ministry of Environment of the Republic of Lithuania;
- Ministry of Energy of the Republic of Lithuania;
- Ministry of Economy of the Republic of Lithuania;
- Lithuanian Labour Exchange under the Ministry of Social Security and Labour of the Republic of Lithuania;
- Energy Agency;
- State Energy Inspectorate under the Ministry of Energy the Republic if Lithuania;
- Qualifications and Vocational Education and Training Development Centre;
- National Training Centre for Energy Specialists;
- Vilnius Jerusalem Labour Market Centre;
- Vilnius Builders Training Centre;
- Kaunas Technical College;
- Vilnius College of Technologies and Design;
- Lithuanian Association of Civil Engineers;
- Republican Association of Manufacturers of Windows and Doors;
- National Passive House Association;
- Business enterprises.

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# AUTHORS

Kaunas University of Technology (J.Ramanauskas, R.Bliūdžius)  
Vilnius Gediminas Technical University (T. Vilutienė, G.Ambrasas)  
Certification Centre of Building Products (R.Encius, K.Pesliakas)  
Lithuanian Builders Association (V.Šarka, G.Laurynaitienė, J.Bureikis)  
Regional Innovations Management Centre (M.Jonauskis, V.Kazakevičius)

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STR 2.01.09:2012 "Energy Performance of Buildings. Certification of Energy Performance"

STR 2.05.01:1999 "Thermal Equipment for Building Envelopes"

STR 2.05.01:2005 "Thermal Technique of Envelopes of Buildings"

# GLOSSARY

**Energy from renewable sources** – energy from renewable non-fossil sources, namely wind, solar, aero thermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases (Directive 2010/31/EC of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings)

**General competence** – ability of a person, the development of which is usually based on the personal characteristics. General competences include creativity, analytical thinking, responsibility, honesty, communicability, etc.). (*Recommendation on the development of the EQF*)

**Nearly zero-energy building** – a building that has a very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby (Directive 2010/31/EC of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings)

**Database** – an arranged (in a systematic or methodical way) collection of data, which can be individually accessible by electronic or other means. Although the term originated in the computer industry, modern uses have been expanded and the EU Database Directive (creating intellectual property rights to databases) now also covers non-electronic types.

**Nearly zero-energy buildings** are buildings that meet the requirements of this Regulation for A++ energy efficiency class buildings, i.e. buildings with very high energy performance, where energy consumption is almost zero or very low; most of the energy comes from renewable energy sources, including energy from renewable sources produced on-site or nearby (STR 2.01.09:2012 Energy Performance of Buildings. Certification of Energy Performance)

**European Qualifications Framework** – a common European reference framework which links countries' qualifications systems together, acting as a translation device to make qualifications more readable and understandable across different countries and systems in Europe. (*Recommendation on the development of the EQF*)

**Functional competence** – ability of a person to perform certain professional activities, actions, functions. (*Recommendation on the development of the EQF*)

**Skills** – the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments) (*Recommendation of the European Parliament and of the Council on the development of the European Qualifications Framework for Lifelong Learning (2008/C111/01)*)

**Skill** – an appropriate aptitude and/or ability to perform actions of a certain intellectual and/or physical nature in a specific area of activity developed as a result of learning. (*Laužackas, R. Profesinio rengimo terminų aiškinamasis žodynas. Terminology of Vocational Education and Training, 2005*)

**Pre-vocational training** – is training and practical activity, restoring and recreating learning motivation, helping trainees to understand the meaning of work, to get acquainted with current occupations, developing key competences and providing knowledge how to acquire an occupation. (*Description of Procedure for Pre-Vocational Training, 2007*)

**Information system (IS)** - the totality the information processing system and organizational resources (information, people, technical measures, finances, etc.) for processing, developing and disseminating (sending and receiving) information [LST ISO 2382-1: 1996. Information technology. Terms and definitions. Part 1. Key terms. Lithuanian Standards Board. 1996. page 33]. In other words, it is a structured collection of processes and procedures which stores data, arranges and transmits it to the user.

**Competence** – the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy. (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*).

**Competence** – ability to perform a certain activity on the basis of the entirety of acquired knowledge, skills, abilities and values. (*Law on Education of the Republic of Lithuania*)

**Qualification** – a formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*)

**Qualification** – ability and right to engage in a certain professional activity, as recognised according to a procedure prescribed in law or in legislative acts of the Government or its authorised institution. (*Amendment of the Law on Education of the Republic of Lithuania, 2003*)

**Lithuanian Qualifications Framework** – a level system of qualifications based on competences necessary for person's activities. (*Law on Education of the Republic of Lithuania*).

**Low-energy buildings (or parts thereof)** are buildings (or parts thereof) conforming to the requirements of this Regulation for B, A, A+ class buildings (STR 2.01.09:2012 Energy Performance of Buildings. Certification of Energy Performance)

**Learning outcomes** – statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence. (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*).

**National qualifications framework** – an instrument for the classification of qualifications according to a set of criteria for specified levels of learning achieved, which aims to integrate and coordinate national qualifications subsystems and improve the transparency, access, progression and quality of qualifications in relation to the labour market and civil society. (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*).

**National qualifications system** – all aspects of a Member State's activity related to the recognition of learning and other mechanisms that link education and training to the labour market and civil society. This includes the development and implementation of institutional arrangements and processes relating to quality assurance, assessment and the award of qualifications. A national qualifications system may be composed of several subsystems and may include a national qualifications framework; (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*).

**Energy performance of a building (or its part thereof)** means the calculated or measured amount of energy needed to meet the energy demand associated with a typical use of the building (STR 2.01.09:2012 Energy Performance of Buildings. Certification of Energy Performance)

**Cognitive competence** – the ability of a person to use special and general education knowledge in his activities. (*Recommendation on the development of the EQF*)

**Initial vocational education and training** – professional training for acquiring the first qualification. (*Amendment of the Law on Vocational Training of the Republic of Lithuania, 2007*)

**Profession** – combinations of activities of a person based on special competences (functional, cognitive and general) in performing production, service, business, education, culture and other activities with specific goals and objectives (AIKOS standard of descriptions)

**Vocational education and training** – training in accordance with qualification improvement programmes helping a person to acquire and improve qualification. (*Amendment of the Law on Vocational Training of the Republic of Lithuania, 2007*)

**Professional standard** – description of evaluation criteria and methods qualifications and competences required for their acquisition (the Law on Vocational Training).

**Sectorial qualification** – a qualification specific to a certain sector and conformant to the activities of the sector (*Methodology for the Development of a Professional Standard, 2012*)

**Sector** – a grouping of professional activities on the basis of their main economic function, product, service or technology. (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*).

**Inter-Sectorial qualification** – qualification specific to several or more economic sectors (*Methodology for the Development of a Professional Standard, 2012*)

**Continuing vocational education and training** – professional training for persons for improving current qualification or acquiring a new one. (*Amendment of the Law on Vocational Training of the Republic of Lithuania, 2007*)

**Knowledge** – the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In

the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual. (*Recommendation of the European Parliament and the Council on the development of the European Qualifications Framework (EQF) for lifelong learning (2008/C 111/01)*).

**The following acronyms were used in the document:**

AM	Ministry of Environment of the Republic of Lithuania
EM	Ministry of Economy of the Republic of Lithuania
EPBD	European Parliament and Council Directives on buildings' energy performance
KPMPC	Qualifications and Vocational Education and Training Development Centre
LSA	Lithuanian Builders Association
LE	low-energy
PEND	Directives on buildings' energy performance
REMC	National Training Centre for Energy Specialists
SADM	Ministry of Social Security and Labour of the Republic of Lithuania
ŠMM	Ministry of Education and Science of the Republic of Lithuania
ŪM	Ministry of Economy of the Republic of Lithuania