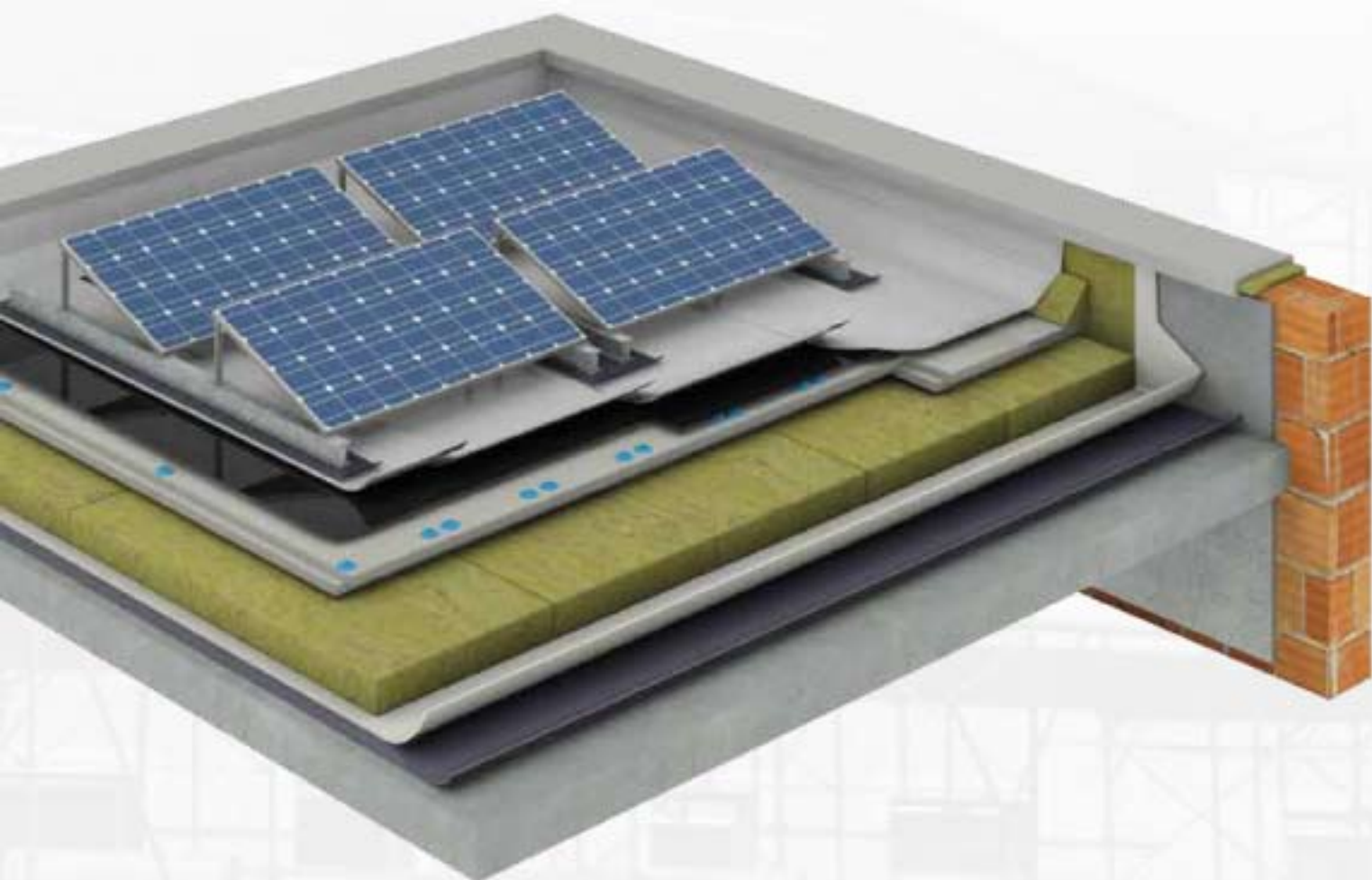




BUILD UP Skills - CROATIA CROSKILLS



NATIONAL ROADMAP FOR A LIFELONG EDUCATION OF CONSTRUCTION WORKERS IN THE FIELD OF ENERGY EFFICIENCY

June, 2013



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IMPRESSUM



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Further information

More details on BUILD UP Skills (Croatia) at

<http://croatia.buildupskills.eu/en/home>

More details on BUILD UP Skills can be found at

www.buildupskills.eu

More details on the IEE programme can be found at

<http://ec.europa.eu/intelligentenergy>

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1. Summary

Due to the lack of adequate qualified workers in the Croatian market, the need has been recognized for education / specialization / further training of the workforce (craftsmen, entrepreneurs) for EE (Energy efficiency) refurbishment and construction of buildings and the installation and maintenance of technical systems which will thus guarantee high performance. This has created measures (recommendations) that would allow for an evaluation of skilled labour force in the market, so that the construction sector could recognize its interest in investing resources in the ongoing training of its employees in the field of energy efficiency. The document "Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy" of the February of 2013 defines the needs and abilities of increasing the number of qualified workers in the Croatian construction sector for the purpose of enhancing the EE in buildings, which is the basis for developing the final document – National Roadmap for a lifelong education of construction workers in the field of EE.

The objectives of the "Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy " documents were:

- defining and quantifying the needs and abilities of the Croatian construction sector for the purpose of contributing to the national EE objectives
- assessing the existing level of knowledge of construction workers within the context of the EE technologies;
- assessing the VET (vocational education and training) education abilities as to the construction sector and the shortcomings/obstacles in the education sector to be eliminated.

By means of a detailed analysis of the construction sector in terms of energy efficiency, the following was concluded:

- A significant number of craftsmen are not familiar with the legislative related to EE.
- Presently, there are no either organized lifelong education programmes offered or schemes for licensing workers and craftsmen in terms of works related to enhancing energy features of buildings.
- The skills required for a quality performance of near-zero energy buildings are rarely found among construction workers. One of the possible reasons for such a situation is a lack of motivation for lifelong education. The economic situation will not allow workers and their employers the additional funds and time needed for learning.
- The market still does not require either specialist training or separate licensing of construction workers so there is not any motivation on the part of workers and employers for investing additional funds in training. In this way, the workers are in a different position from engineers whose lifelong education is compulsory and thus makes them more competitive in the market.
- The overall number of workers (37600) to be trained in the field of EE and RES (renewable energy sources) has been assessed; it is to be noted, however, that there was an obstacle in assessing the afore mentioned number, namely there was a lack and/or incompleteness of statistical data on the level of education of the existing workers and especially of those in the field of unreported work ("grey economy").

Moreover, the most important obstacles have been identified. One of the largest challenges that the construction sector is to face is the fact that many workers have not completed an adequate (or have not completed any) training related to construction/refurbishment of EE buildings and consequently have no knowledge either concerning some aspects (roofers) or concerning performance as a whole. Another obstacle is the slowness in introducing changes into the education sector, which inhibits the process of deployment of new knowledge into the building stock sector. As there is no obligation of either certification or lifelong education (and scoring respective points), further education/training thus brings no market advantages and the owners of companies/crafts hardly decide to send their workers to respective courses; this in turn causes a lowered rate of interest for such training in the market. The respective education programmes do not comply with the market demands, or, rather, the compliance processes and the respective administrative procedures are developing too slowly if compared with the market needs and this leads to the employment of inadequately qualified or non-qualified workforce and a consequently impaired competitiveness of such employers. The current capacities at VET schools do have a potential of providing EE and RES knowledge and training for students in their practical work classes (in cooperation with experts, contractors and construction materials producers); however, the afore mentioned capacities are presently not utilized enough. The national status quo analysis showed a huge lack of construction workers and an urgent need for further education for these workers in order for the EE objectives of the Republic of Croatia to be attained.

The creation of National Roadmap included all the relevant sectors dealing with education, energetics and construction so that the future use of Roadmap could be useful for all sectors. The contribution to the creation of National Roadmap had been planned by means of establishing a multi-sector working group dubbed the National Qualification Platform (NQP) consisting of representatives of organizations from various sectors that are actively acting in the field of EE. The NQP comprises of 64 representatives coming from 54 organizations from various sectors.

At the first NQP's meeting, Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy was presented and the attendants had the opportunity to read and study the whole text and to give their initial comments and suggestions as to resolving the obstacles that had been identified. The proposals of the measures to be undertaken were being given in the course of 5 focus groups meetings that took place in the April of 2013. There were 27 measures proposed and they were in turn sorted in 4 groups, namely, general, technical, legislative and other measures. Other measures (OM) comprise of measures that are not directly related to the education of workers but are still needed for the purpose of a quality implementation of other measures.

The results of the focus groups' meetings were presented at the 2nd National Platform Meeting as the first National Roadmap Draft for a Lifelong Education of Construction Workers in the Field of Energy Efficiency (National Roadmap in further text). The measures were commented in detail, analysed and upgraded. Moreover, within the agenda of the 2nd National Platform Meeting and in cooperation with the National Platform members, a mutual synergic action planning took place yielding the steps to be taken for the purpose of the implementation of the measures, allocation of tasks to the respective contributors to implement the measures, the resources for the implementation and the timeframe.

Third NQP's meeting was focused on interactive discussion of formal acceptance and practical implementation of the National roadmap.

As it has already been told, the most significant obstacle in attaining the energy objectives of the Republic of Croatia is the lack of quality-trained workers in the field of EE and RES. Accordingly, when the measures were tailored and the action plan performed, the utmost attention was paid to the education of target groups and the accompanying administrative system needed for a quality performance of the education. This was done since presently there are no courses in Croatia that would deal with a lifelong education of workers in the field of EE and RES. Besides the training of the target groups (already employed skilled and low-skilled workers and the unemployed), the measures as well aim at the training of trainers. For this purpose, BUILD UP Skills Pillar II should pay the largest share of attention to the quality initial steps toward establishing the education system. At the end of the National Roadmap, please find enclosed the letters of support (endorsement documents) by the relevant bodies and stakeholders thus undertaking to implement and deploy the measures.

2. Introduction

The EU experiences and the experiences in Croatia have shown that energy-efficient refurbishment and construction of low-energy, passive and nearly zero energy buildings is currently a major challenge to the construction sector including industry as a whole. The main objective of the National Roadmap for Croatia is to develop national measures to establish a system of continuous education and training of construction workers in the area of energy efficiency. In addition, a sufficient number of qualified workers with the skills required to meet the EU's 20-20-20 objectives in the building sector is to be provided for. Special attention should be given to those workers who are already in the labour market, because they represent a large workforce and they are a hard-to-reach target group. What is also very important is the endorsement of the National Roadmap by the relevant authorities and stakeholders bearing the responsibility of implementing and deploying the roadmap measures, i.e. gaining the support from the relevant stakeholders. The endorsement is important so that the measures are implemented as successfully as possible for the purpose of attaining a long-term effect on the building sector in the Republic of Croatia (RC).

Based on the Analysis of the market, needs and investments in the sector in the last four years, it is difficult to expect the launch of a positive business cycle in this industry as to the construction of new apartments. Surging energy prices in the world market- and in accordance with their current consumption in the sector- and taking into account the condition of the housing stock of the RC, it can be concluded that the energy-efficient refurbishment is necessary and that, despite the major challenges in the years to come, the most of the construction activities in this very area can be expected.

To achieve the objectives of the European directives in EE in building stock, it is necessary to increase the number of qualified workers in the market, namely the labour force, craftsmen and entrepreneurs who have enough knowledge or have specialized in performing with the use of new technologies and who can guarantee a high quality performance after the construction is completed. Also, the measures have to be designed to create conditions for the evaluation of skilled workers (ordinances, recommendations). National Roadmap for the lifelong education of construction workers in the energy efficiency of the Republic of Croatia have established the guidelines for the acquisition of knowledge, skills and competences of the Croatian construction workers to a level that will enable them to reliably build nearly zero-energy buildings and to perform energy refurbishments of the existing buildings. It also proposes the accompanying measures necessary for the successful implementation of the training of trainers. In defining National Roadmap, a combination of approaches from the bottom up (through consultations and meetings with stakeholders) and from the top down (through the creation of an extensive analysis of the national status quo) was used. As a final result, National guidelines proposed measure groups: general, legislative and technical, which are to lead to the establishment of a common system of education and training of construction workers in the area of EE and RES.

3. The Construction Sector

Construction is an important part of the economy of Croatia, which is as well proved by the fact that the share of the construction sector peaked to 7,7% of the GNP (Gross national product) in 2009 (Figure 1) The feasible housing loans conditions and an increased accessibility of the loans caused the demand for the residential real estate to exceed the supply which in turn gave a spur to the rate of residential construction. At the turn of the year of 2008 to the year of 2009 the formerly rising trend changed and the value of works dropped by more than 10%. A significant decrease in the works value continued to be recorded in the years to have followed (the first two months in 2012 the average annual decrease amounted 11.6%). As a consequence, there was a drop in the number of employed in the construction sector (from 82,189 workers late in 2011 to 78,550 – 5.9% of all the employed- in the March of 2012 already). It is a 4.23% drop over a very short period of time. Late in 2012, there were 7,514 craft businesses dealing with some sort of activities in the construction sector. In accordance with the Central Bureau of Statistics (CBS), on average, there were 50,218 workers at the construction sites in the year of 2011. This figure relates to the legal entities in construction business employing 5 or more workers and the figure shows a drop in the number of the employed in comparison with the previous period.

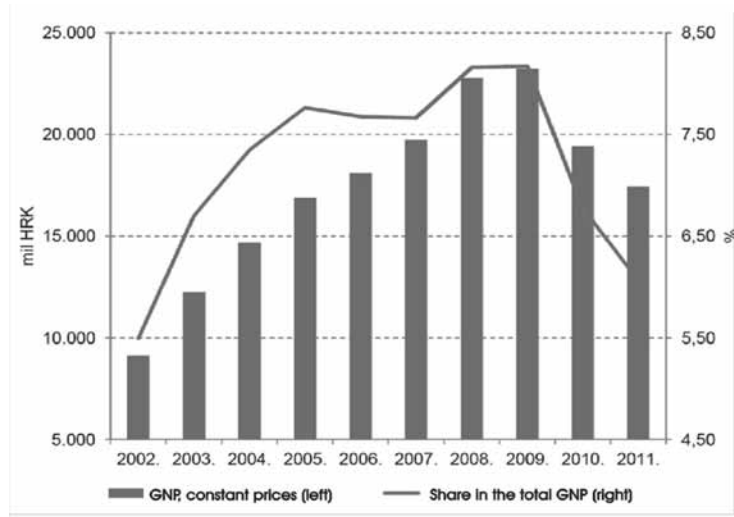


Figure 1 – The share of the construction sector in the Croatian GNP; Source: CBS, Raiffeisen research

All the relevant statistical indicators suggest that the Croatian construction industry is in crisis. One of the main causes of the slowdown and the lack of investment in the public and private sectors is a result of the recession. In 2011 in Croatia, according to CBS, there were 2,257,515 dwelling units with a total of 150 million square meters of residential area. As to public buildings, the data from UNDP’s project “Promoting EE in Public Buildings” indicates 9,000 buildings owned by towns, municipalities, counties and state administration and topping over 9.5 million square meters of area.

Table 1 – Basic data on the construction sector; source: Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy

Overall number of workers in the construction sector	78,850
The number of workers in the building stock sector	31,540
Estimate of the number of workers for attaining the 20-20-20 objectives	37,600
The number of persons entering the labour market after the initial education	6,564/year
The number of persons attending lifelong education courses	-
The needed number of trainers	250

3.1. Energy and the use of RES in building stock

In the year of 2010, the energy consumption in buildings amounted to 42.3% of total spending in Croatia [1]. Although the assessments showed that 80% of existing residential buildings can be classified in the lowest energy classes (with the consumption of energy for heating more than 200-250 kWh/m²), up to 2013 there were incentives to improve the current situation for several public buildings. Incentives for households to improve the building envelope and installation of solar heating systems, changes in biomass boilers and heat pumps applications have been possible since the summer of 2013 in some communities where the funds were granted through Environmental Protection and Energy Efficiency Fund tenders. The share of renewable energy in total energy consumption was 13.3% in 2010 [1]. The total production of electricity in 2010 amounted to 14,105 GWh of which the renewable energy sources, including large hydro facilities, produced about 61%. In fact, the large hydros participated with 58.9%, while 2.1% of the electricity produced from other renewable sources (small hydro facilities, wind fields, biomass, biogas and landfill gas). 45.6% of the total amount of the consumed electricity was produced from renewable energy sources out of which the electricity produced in large plants amounted 44%, while electricity generated from other renewable sources amounted 1.6% (Energy in Croatia 2010).

The most significant share in energy consumption in buildings is made by heating energy, hot water preparation energy and air conditioning energy. More detailed shares are as follows:

- 40-60% heating
- 15-35% domestic hot water preparation
- 5-15% cooking
- 10-20% non-thermal needs (lighting, TV, computers etc.)

As the vast majority of the inhabited buildings in Croatia feature an inappropriate thermal insulation and thus causes a consumption that is two to three times as much as the targeted one (Figure 2), the EE refurbishment of buildings is an obligatory step in attaining the 20-20-20 objectives.

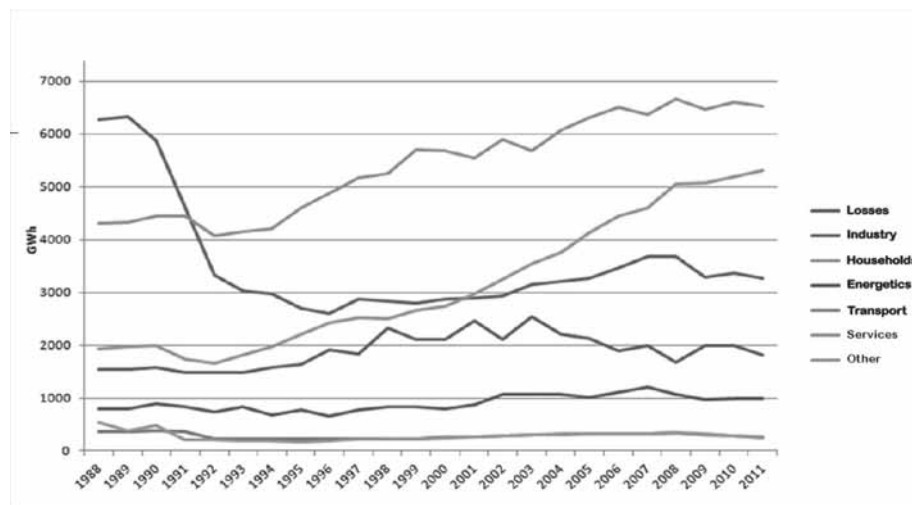


Figure 2 – The electricity consumption in various sectors as compared to the household sector; source: Energy in Croatia, 2010

The geographic position of Croatia and its mild climate provide optimal conditions for the use of solar thermal systems. However, due to a lack of incentives, according to the installed area of solar collectors, the Republic of Croatia lags behind the developed neighbouring countries (Table 2). For example, in 2012, there was the installed solar thermal systems' area of 0.584 m² per inhabitant in Austria and 0.099 m² per inhabitant in Slovenia [2], table 2. When it is compared to the situation in Croatia (0.028 m² per inhabitant), the results show that there is almost four times larger area of the installed solar thermal systems per an average inhabitant in Slovenia and even twenty-one times larger area per an average inhabitant of Austria (in accordance with the calculation of the author based on the 95,900 m² of the solar thermal systems having been installed in Croatia in 2010 [3] and the estimated total of 120.000 m² having been installed in 2012 with 4.29 million inhabitants).

Table 2 An overview of the installed solar thermal systems area per inhabitant in EU member countries in 2012 (sources: the author's own calculation for Croatia and EurObserv`ER: Solar thermal and concentrated solar power barometer 2013)

State	m ² /inhabitant	kWh/inhabitant
Cyprus	0,837	0,586
Austria	0,584	0,409
Greece	0,365	0,256
Germany	0,199	0,139
Denmark	0,135	0,094
Malta	0,124	0,087
Slovenia	0,099	0,069
Portugal	0,092	0,064
Czech Republic	0,085	0,059
Luxembourg	0,073	0,051
Spain	0,064	0,045
Ireland	0,057	0,040
Italy	0,056	0,039
Netherlands	0,052	0,036
Sweden	0,051	0,036
Belgium	0,043	0,030
France	0,037	0,026
Poland	0,031	0,022
Slovakia	0,029	0,020
Croatia	0,029	0,020
Hungary	0,018	0,013
Bulgaria	0,011	0,008
United Kingdom	0,010	0,007
Finland	0,008	0,006
Romania	0,007	0,005
Latvia	0,007	0,005
Estonia	0,005	0,003
Lithuania	0,003	0,002
Total EU 28	0,084	0,059

According to the Energy Strategy of 2009, the potential of solar thermal systems has been identified and the objective has been set for the installed solar thermal systems area to increase 35 times by the year of 2030. However, the objective of the solar energy analyses is to attain the afore mentioned 2030 objective by the year of 2020 already and thus enable the creation of 1,300 direct and approximately 2,000 indirect green jobs. The same goes for biomass and if the Energy Strategy 2030 objectives are attained by 2020, this will result in about 5,000 direct and 55,000 indirect working places in the sector [4]. Table 3 shows the dynamics of the expected increase in the exploitation of solar energy in Croatia by 2030.

Table 3 The dynamics of the expected increase in the exploitation of solar energy in Croatia by 2030 (source: Green Book of Energy Strategy), 2008.)

	2010	2020	2030
Solar energy – Domestic Hot water preparation (DHW)	0.50	4.96	12.21
Inhabitants that use the solar DHW (1.5 m ² of solar panel per inhabitant)	67,691	660,000	1,653,017
Average m ² per 1000 inhabitants	23.80	225.00	563.53
Solar energy - Photovoltaic [PJ]	0.01	0.30	1.66
Installed power [MW]	1.52	45.66	252.66
Watts per inhabitant - average	0.34	10.38	57.42
Solar energy - total [PJ]	0.51	5.27	13.87

3.2. Energetics and building stock—national policies and strategies to contribute to the 2020 objectives

Within the institutional and legislative framework of energy efficiency in construction, as a new EU member state, the Republic of Croatia adopted the principles of a common European energy policy and adjusted national policies and legislation with the unique strategy of energy development and climate change mitigation at the level of the European Union. The fundamental national documents concerning EE policies have been adopted, which includes not only the Energy Sector Development Strategy (Official Gazette 130/2009) [5] but as well plan documents based on the Act on Energy End-Use Efficiency: National Energy Efficiency Program 2008 - 2016 [6], First National Energy Efficiency Action Plan of the Republic of Croatia 2008 - 2010 [7] and Second National Energy Efficiency Action Plan of the Republic of Croatia until the end of 2013 [8].

To achieve the goals of energy efficiency, the institutional framework for the implementation of the policy of energy efficiency in construction has been strengthened and, in accordance with the Ordinance on the internal organization of the Ministry of Construction and Physical Planning adopted by the Croatian Government at its session on February 23, 2012, a new directorate for energy efficiency in construction, strategic planning and international cooperation was established within the Ministry of Construction and Physical Planning.

According to Article 15 Paragraph 2 of the Act on Spatial Planning and Construction, prior to the issuance of the use permit, prior to a change of ownership or lease of a building or its part an energy performance certificate of the building shall be obtained and issued by an authorized person. Currently, there are 10 institutions in Croatia offering training programs for professionals who will do energy certification of buildings. The training programs have been completed by more than 1100 architects and engineers up to now (June, 2013), out of which some 600 have been authorized for energy audits and energy certification of buildings.

Based on the directives of the European Parliament and of the Council and on the Second Energy Efficiency Action Plan for the period until the end of 2013 [8] in which the plan was included for refurbishment of buildings of the public sector, the Ministry has drafted the Program of EE Refurbishment of Public Buildings 2012 - 2013 [9] with a focus on state-owned buildings such as hospitals, abandoned children's homes, schools, kindergartens and administrative buildings.

For 2013, the drafting of EE Refurbishment of Residential Building Program and EE Refurbishment of Commercial Sector Buildings Program are planned. The refurbishment of buildings is to be financed through a combination of funds from European Regional Development Fund (ERDF), European Energy Efficiency Fund (EEE-F) and JESSICA. However, the preparatory activities of creating the database on buildings, obtaining the required documentation and issuing energy certificates and performing energy audits are to commence immediately so that the afore mentioned programs could use the funds as of the January of 2014. Simultaneously with the preparations for the programs, the drafting of the Registry of

buildings in the territory of Croatia is to commence and it is to be drafted in cooperation with the State Geodesy Directorate and Land Registry Office. Moreover, the program aimed at increasing the number of nearly zero energy houses will continually be developed once the reference buildings have been chosen and the optimal refurbishment cost estimation has been performed. Activities that are planned to take place in the course of 2013 will result in measures that are in turn to provide for attaining the objectives in the realms of EE and bringing the whole procedures in conformity with the EU directives, all of which in turn implies a strengthening of the existing administrative capacities, upgrading and maintenance of the existing information systems and establishing new ones and obtaining the expertise needed for changes and supplements to the existing legislative and regulations. Within the process of drafting the low-carbon development strategy (the project moderated by the Ministry of Environmental and Nature Protection), a SWOT analysis was performed for the building stock sector and it included 24 experts (October 26, 2012); the building stock sector was thus recognized as a sector to feature the largest potentials in energy saving and increasing energy efficiency. The sector is, in one hand, well developed in the sense of professional staff and construction executi, but yet deeply disturbed by the financial crisis in the other hand (lack of demand in the market, a vast number of unsold dwelling units of various areas, various performance quality and various energy performances). It is worrying, for example, that the ESCO model of financing EE measures has not started functioning fully, which is an obstacle to the development of the entrepreneurship and energy services in this sector. There are, however, good practice examples of combining the subsidy-cofinanced residential construction and EE, as well as the green construction incentives in Croatia. The afore mentioned SWOT analysis workshop yielded the priority measures for the building stock sector (Table 4).

Table 4 – Priority measures for attaining low-carbon development (as recognized through the Low-Carbon Development Strategy)

	Reducing thermal losses in the existing buildings
	EE systems of heating and air conditioning
Building Stock	New buildings to be designed as nearly-zero energy ones
	Individual consumption metering and intelligent energy management for buildings
	RES in buildings (Solar energy and biomass)

3.3. VET education in Croatia

As of the February of 2013, several ministries and other institutions contributed to the drafting of the Act on the Croatian Qualifications Framework – CROQF- (Official Gazette 22/2013) [11] that establish Croatian Qualifications Framework as an instrument of balancing the system and provides for clarity, for the approach to acquisition of qualifications, for the justified acquisition of qualifications, for the quality of qualifications, for mobility and for relating the levels of the Croatian qualifications with the levels stipulated in European Qualifications Framework (EQF) and Qualifications frameworks in the European Higher Education Area (QF-EHEA) (covers relations in university education), and, indirectly, with the qualification levels in QFs in other countries.

The National Qualification Framework has been under drafting and it will be in conformity with the EQF in the sense of the qualifications being sorted in 8 levels of educational qualifications (Figure 3); the NQF features, however, a general approach and does not specifically deal with education for vocations in construction sector. All the future education programs will have to be in conformity with the NQF. The activities that BUILD Up Skills CROSkills deals with will primarily deal with the levels II III and IV, i.e. VET for adults and the regular secondary school level VET and education.

The education system of secondary schools in the Republic of Croatia is, in the sense of programs, a centralized system for which the Ministry of Science, Education and Sports is in charge and the Ministry takes care of the process of educating the regular secondary school students, enrolment and issuing certificates upon completion the courses that are offered by the four types of schools, namely grammar schools, four-year courses secondary VET schools, three-year courses VET schools educating students for industry careers and art secondary schools.

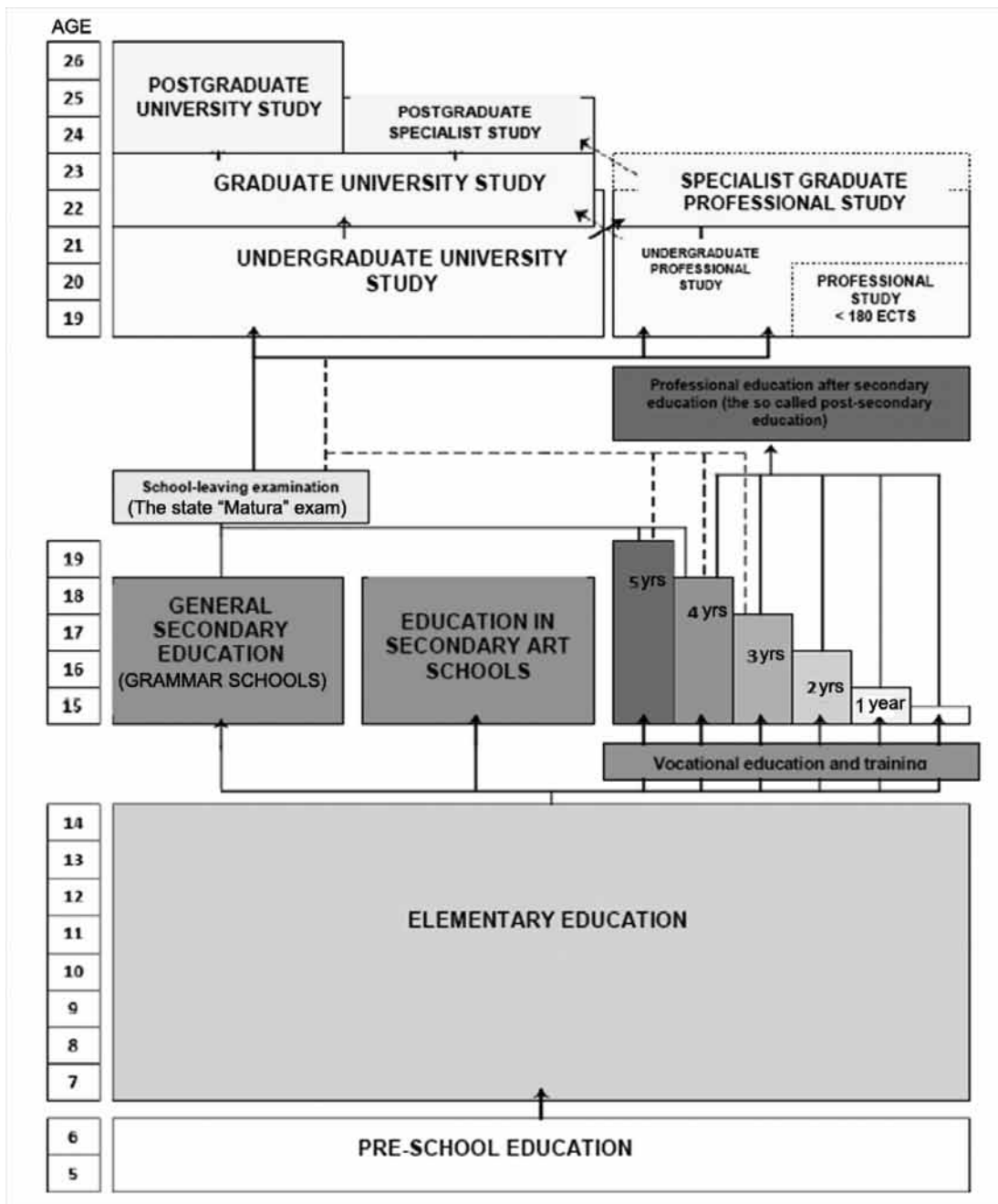


Figure 3 –An overview of the present education system in Croatia

As to the four- and three-year courses relevant for CROSKILLS project, the numbers of yearly enrolled students as to courses are as follows: approx. 1 050 technicians in vocations related to construction, approx. 550 students in three-year courses related to construction, 700 students – fitters in engineering vocations, 500 joiners and wall painters and some 1200 students in engineering and electro technical vocations. In total, it is some 4 000 students per year, which amounts 8 % of all secondary school students enrolled per a year. (Table 5).

Profession	REGULAR SCHOOLING										ADULT EDUCATION				
	Number of students who attended school between 2006 and 2009					Number of students who attended school between 2009 and 2013 (school year 2009/10; 2010/11; 2011/12; 2012/13)					Number of students attending who completed schooling or are in the course of schooling				
	1st class	2nd class	3rd class	4th class	Total	1st class	2nd class	3rd class	4th class	Total	2010/11	2011/12	Still in the course of schooling	Total	
Construction	Architectural technician	485	477	408	430	1801	522	547	498	459	2028				
	Builder	339	311	330	292	1272	308	345	356	382	1391				
	Geodetic technician	250	224	217	186	888	226	207	195	258	886				
	Stone-cutting technician	18	11	13	17	59	12	17	13	12	54				
	TOTAL 4th year	1102	1023	968	925	4918	1068	1116	1062	1111	4357				
	Bricklayer	117	132	140	0	389	104	113	100	0	317				
	Stone-mason	17	11	17	0	45	25	27	25	0	77				
	Chimney-sweeper	0	0	0	0	0	21	18	12	0	51				
	Plasterer	0	1	0	0	1	0	0	0	0	0				
	Carpenter	29	25	37	0	91	48	44	39	0	131				
	Roofer	0	1	6	0	7	10	7	6	0	23				
	Bar-bender	2	2	1	0	5	0	3	0	0	3				
	Drywall installer	55	48	45	0	148	91	80	67	0	238				
	Floor-layer	5	14	17	0	36	10	6	11	0	27				
	Ceramicist and layer	148	139	158	0	445	122	127	134	0	383				
	Self-propelled construction machinery operator	133	124	116	0	373	107	102	93	0	302				
	Construction and mining machinery mechanic	0	0	0	0	0	7	7	9	0	23				
TOTAL 3rd year	506	497	537	0	1540	545	534	496	0	1575					
Mechanical engineering	Heating and air-conditioning installer	424	430	466	0	1320	390	353	364	0	1107				
	Gas-fitter	186	152	155	0	493	112	107	129	0	351				
	Plumber	323	253	269	0	845	191	220	215	0	626				
	TOTAL 3rd year	933	835	890	0	2658	596	680	708	0	2084				
Wood processing	Joiner	233	254	225	0	712	344	363	309	0	1016				
	TOTAL 3rd year	233	254	225	0	712	344	363	309	0	1016				
Other services	House-and-woodwork painter	191	147	174	0	512	131	113	112	0	356				
	TOTAL 3rd year	191	147	174	0	512	131	113	112	0	356				
Glass processing	Glass-cutter	2	0	3	0	5	3	4	1	0	8				
	TOTAL 3rd year	2	0	3	0	5	3	4	1	0	8				
TOTAL 3rd class	1865	1733	1829	0	5427	1719	1694	1626	0	5039					
TOTAL classes 3 and 4	2967	2756	2797	925	9445	2787	2810	2688	1111	9396					

Table 5 An overview of the regular students in VET secondary school schools from 2006 to 2013.

Although there are a few exceptions (VET school in Zagreb and Čakovec, Technical School Ruđer Bošković in Zagreb and VET School Vice Vlatković in Zadar), in general, there is no systematic training of students and workers in the fields of EE and RES despite the fact that the number of workers drastically exceeds the number of other experts in the construction sector (university-trained engineers and architects etc.).

As of the June of 2013, an ordinance has been passed that requires education and certification for authorised photovoltaic systems (PVS) fitters. Up to that point, the works related to PVSs had been performed by electro fitters who were authorised by a certified project engineer whereas other RES works are performed by heating and air conditioning systems fitters.

No other similar ordinance has been passed yet for other RES related works. The planning of the educational activities is based on the analysis of the statistic indicators of workforce supply and demand, on the workforce and additional skills needs of employers and on the basis of the data obtained from yearly Employers Surveying. Besides the needs for education, other indicators relevant for the assessments of needs in the labour market are analysed as well, namely the number of students who have completed their secondary school courses, the number of workers who could be unemployed etc. In the course of education, the progress and skill accomplishment of students are continuously monitored as well as the level of students' satisfaction with the education/skills acquired; there is also a self-assessment as to the relevance of knowledge and skills in terms of chances of getting a job upon completion of education.

Within the EU projects at the regional or local level, there is a series of incentives aiming at bringing a systematic order into the realm of construction. By means of the assistance from some of them such as IPA Component IV – Human Resources Development: “Implementation of New Curricula” [14], there was an attempt of implementing a new curriculum into VET schools for the purpose of preparing the students for the labour market.

School of Design, Graphics and Design of Split and the School of Building and Crafts of Čakovec gave proposal for standard of occupation, standard for qualification and proposal of curricula for Technician of Sustainable Construction. Standard of occupation and standard for qualification were given for opinion to Sectoral Council of Construction and Geodesy. Agency for Vocational Education and Training and Adult Education required amendment for proposal of curricula. Reasons for adoption curricula are:

1. There is a need for the experts of widest range for future works on the existing buildings and the new buildings, because the consumption of energy from traditional sources needs to be significantly reduced, and the production of energy from RES should start as soon as possible because of joining the EU membership where the level of education for sustainable construction in other countries should as well be caught up and this could not be attained if the existing curricula were not revised and if the afore mentioned curriculum were not verified.
2. The curriculum is well balanced regarding the general education and vocational subjects and the curriculum would enable many of students to continue education at the university level, namely at the universities offering courses in mechanical engineering, electrical engineering, civil engineering and architecture.
3. If the curriculum is timely verified and the enrolment make possible for students as of next year, the curriculum will prove itself attractive and make even more students to enrol it the year after regarding the interest for such an important vocational choice and future development.

3.4. Labour force—differences, needs and shortcomings

At estimating the number of workers to be trained at the skill level and for the purpose of attaining the EU EE 20-20-20 objectives, several factors were taken into consideration. The main part of the assessment was based on the results of the questionnaire taken – within the project- among craftsmen who perform their activities in any of the target vocations in construction, among workers who perform specific craftsmen works and among the respective personnel at VET schools.

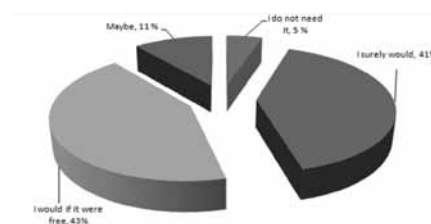


Figure 4 The results obtained from the question relating to the perception of craftsmen as to the importance and possibilities for the additional training and to their expectations as to the realm of EE technologies.

It is evident from Figure 4 that there is an interest for additional education in workers. Even 41 % of them would surely take additional training courses if there were a systematic education scheme whereas 43 % more of them would take courses if they were free.

A more detailed overview of the qualified workers in some building stock sectors is given in Table 6.

Table 6 Masters and workers qualified for crafts, source: Department of Education of the Croatian Chamber of Commerce, 2012.

Occupation	Qualified	Masters	Masters to take the vocational part of the exam
Plasterer		63	9
Heating and air condition systems installer		498	410
Electrician		551	376
Gas supply fitter		374	273
Glazier		11	18
Carpenter		118	75
Plumber		122	404
Sheet-metal worker		110	94
Roofer		47	19
Bricklayer		565	207
Locksmith		148	196
Electronics mechanic		30	110
Electro mechanic		133	356
Machinist		88	307
Painter		285	
Insulation fitter	120		
Glazier in construction works	207		
Floor layer	253		

Table 7 shows the estimations as to the number of workers needed in three fields: refurbishing of buildings, biomass-burning and solar heating systems fitting and wind-energy using systems.

Table 7 The estimated number of green jobs needed for attaining the 20-20-20 objectives in Croatia by the year of 2020 [12]

Type of works	Estimated number of workers required to achieve 20 - 20 - 20 objectives
Wall insulation	9400
Roof insulation/ replacement	5700
Carpentry replacement	6500
Biomass use	9000
Solar energy	4800
Wind energy	2200
TOTAL:	37600

The analysis of the number of workers needed for attaining the 20-20-20 objectives was as well performed for the workers specialized in constructing nearly-zero energy buildings and refurbishing the old ones accordingly; as well the analysis was performed for the workers in the field of the use of solar energy and biomass (first and foremost within the building stock sector). An overview of the estimated number of workers in the field of use of wind energy has been given as well. Some of the data listed

are not official so the estimates based on the (Central Bureau of Statistics (CBS) data have been listed. A more detailed overview of the workers needed in the construction sector (EE realm only) is given in Table 8.

Table 8 The estimated needed number of workers to be trained for attaining the national 20-20-20 objectives, floor areas in accordance with the CBS data.

Type of work	Type of building	Total layout surface area	Envelope surface area	Opening surface area (window and doors)	Envelope surface area without openings	Roof surface area for a 30° slope	Planned annual building reconstruction -3% renovation according to EED	No of workers per 1000 m ²	Reconstruction duration per unit (of wall, system of 1000 m ²)	Total No of workers required for annual building reconstruction	Effective days per year	Average No of renovated units yearly per team	No of workers require for reconstruction/renovation	Total number of workers needed to achieve 20-20-20
		m ²	m ²	m ²	m ²	m ²	m ² /год.	-	days	-	days	-	-	
Wall insulation	Residential buildings	14938000	198675400	44814000	153861400		4615842	8	5	36927	220	5	7385	~9400
	Nonresidential buildings	43380000	56394000	13014000	43380000		1301400	8	5	10411	220	5	2082	
Insulation / replacement of roof	Family houses	97097000				111855744	3355672	30	35	100670	220	31	3203	~5700
	Dwellings	1897875				2186352	65591	30	35	1968	220	31	63	
	Public houses	43380000				49973760	1499213	25	25	37480	220	15	2499	
Replacement of doors and windows	Family houses			29129100			873873	42	1	3310	220		3310	~6500
	Dwellings			15684900			470547	42	1	1782	220		1782	
	Public houses			13014000			390420	42	1	1479	220		1479	

3.5. Obstacles

There are several already existing as well as some potential obstacles that are to be resolved for the purpose of attaining the set objectives. One of the major obstacles is at the same time one of the greatest challenge the construction sector is facing and this is a low level of knowledge as to EE technologies in the construction workers. Many of workers feature inadequate or even none training concerning the construction of EE buildings.

One possible obstacle to the changes in the education system is the slowness of their implementation and that can put in question a timely implementation of necessary knowledge in the building stock sector. Existing courses that deal with energy efficiency programs in educational institutions are either optional or not systematically taught through the education course so another key problem comes into the light, namely the defining of curricula for EE education in VET schools and the curricula should be in conformity with other curricula in the sector and in conformity with the education capacities of VET schools in one hand and with the EE requirements

As a result of the global financial crisis, the Croatian labour market has lost about 30 000 workers in the construction sector and the construction companies are not doing well either because the investments in the construction sector have been drastically reduced and companies are constantly looking for new jobs and they cannot afford the time needed for a further education of workers as the workers are more needed at sites. Moreover, the financial market instability has been recognized as another obstacle more.

There is very little interest in EE training in SMEs and crafts. Since there is no mandatory certification of workers or mandatory training (and the possibility of lifelong learning), and additional education does not bring market advantages, business owners and trades do not decide to send their employees to training, which in turn causes a decreased interest in such training on the market. It is more difficult for the older population of employers (mostly traditional small businesses) to keep pace with the advance of technologies.

Due to a lack of statistical data, it is extremely difficult to make a qualitative assessment of the current state of education and the educational needs of construction workers. The reason for this is partly because of the grey economy. Specifically, there are a large number of unreported workers from Croatia and the neighbouring countries. Another reason is that the main contractors have no insight in or control over the qualifications of employees working for numerous contractors (subcontractors) in performance of construction work, and also because of a lack of workers of certain construction vocations that are trained in vocational schools in the records of the Croatian Chamber of Trades and Crafts.

The obstacle is as well a lack of coordination between the trades and vocational education. Educational programs do not follow the market needs, and coordination and administrative procedures that accompany it run too slow for the market, which leads to inappropriate recruitment of skilled or unskilled workers and reduce the competitiveness of such employers. Finally, the utilization of space in the school workshops for practical training in the construction – related vocations proved as an obstacle as well. The current capacities of the vocational schools – in cooperation with experts, contractors and construction equipment producers - do have the potentials to provide for EE and RES training for students within the timeframe of the educational programs; however, these capacities have not been used enough.

4. National Roadmap creation methodology

The result of CROSKILLS project is the development and endorsement of the national roadmap for the lifelong education of construction workers in EE, which should also allow for the market evaluation of construction workers and contribute to the attaining of national EE objectives. The process of developing national roadmap is based on the involvement of all relevant sectors in the areas of education, energy and construction so that the future practical application of the guidelines could be useful for all the sectors. The contribution to the development of National Roadmap is planned through the establishing of a multi-sectoral working group called the National Qualification Platform consisting of representatives of organizations from different sectors - government bodies and agencies, professional associations, trade unions and chambers that bring together different profiles of construction jobs in the trade, the construction industry and energy, VET construction and technical schools, local and regional governments and energy agencies, financial institutions, building managers and tenants' associations and individual companies (manufacturers of technical systems and equipment, contractors) active in the field of energy efficiency. The National Qualification Platform (NQP) consists of 64 representatives of 51 organizations from various sectors. The National Roadmap was drafted via consultations and counselling with the NQP members and through (Figure 5):

1. Three National Counselling, i.e. three NQP meetings:
 - The First National Counselling and the First NQP Meeting on February 28, 2013, Zagreb
 - The Second National Counselling and the Second NQP Meeting on July 4 and 5, 2013, Terme Tuhelj
 - The Third National Counselling and the Third NQP Meeting on November 21 and 22, 2013, Opatija
2. Five consultative meetings with focus groups (FG):
 - 1ST FG meeting - Financial institutions; building - managing and energetics professional associations - at the University of Zagreb, Faculty of Civil Engineering in Zagreb, on April 19, 2013.
 - 2ND FG meeting - Construction sector - companies, crafts and professional associations - at the Croatian Chamber of Trades and Crafts in Zagreb, on April 22, 2013
 - 3RD FG meeting - Public administration bodies and public institutions of energetics and construction - at the Ministry of Construction and Physical Planning in Zagreb, on April 25, 2013
 - 4TH FG meeting - Construction sector - companies, crafts and professional associations - at the Croatian Chamber of Trades and Crafts in Zagreb, on April 30, 2013
 - 5TH FG meeting - Education sector - at the Construction Technical School of Rijeka in Rijeka, on May 3, 2013.

and as well through bringing the gathered data in conformity, including the data from Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy and the suggestions from the Project Team.

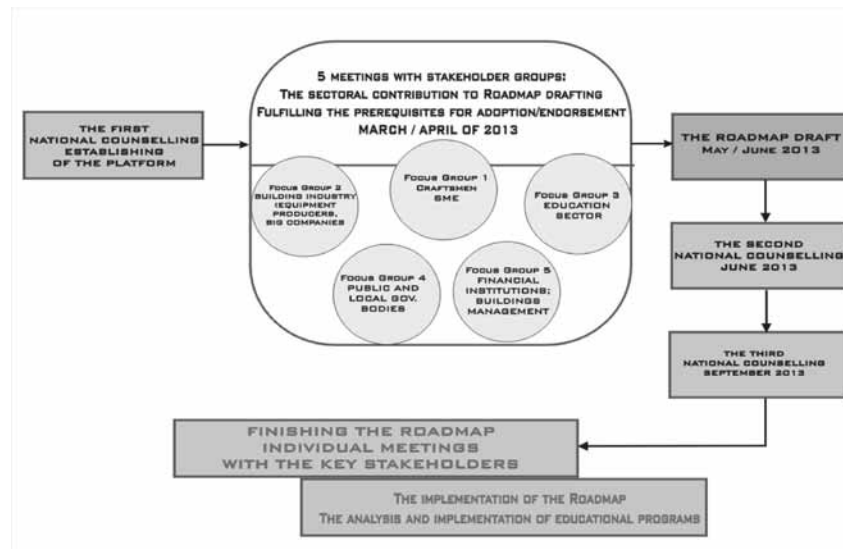


Figure 5 The consultation process of creating the Roadmap

At the 1st National Counselling, CROSKILLS – Build Up Skills Croatia project was presented to the attendants, the NQP was established and the results of the Status Quo Analysis were presented as well as the needs for training of construction workers in the field of EE. Moreover, the initial suggestions were offered for the purpose of drafting the National Roadmap for a lifelong education of construction workers in the field of energy efficiency.

The 5 FG consultative meetings followed for the purpose of getting suggestions or the purpose of drafting the National Roadmap for a lifelong education of construction workers in the field of energy efficiency. The FGs were divided into key groups: the construction sector (private companies, craftsmen); financial institutions; building-management and energetics professional associations, public administration bodies and public institutions in energetics and construction, construction sector-industry and education sector. The consultative FG meetings consisted of two parts. In the first part, the opinions, attitudes and experience of the respective sectors were asked on account of:

- the skills and qualifications of construction workers needed for attaining the 20-20-20 objectives in the construction sector,
- priorities in the education content and levels,
- the possibilities of implementing a (compulsory) lifelong education in EE field for construction workers
- financing the (compulsory) lifelong education in EE field for construction workers
- the certification/licensing the workers and the market evaluation of the educated labour force

In the second part of a meeting, the attendants proposed the priority measures to enter the National Roadmap. The measures are divided in three groups: Legislative Measures, Technical Measures and General Measures.

Based on the measures suggested at the meetings, the Project Team proposed and performed a more detailed division of the measures, namely General Measures, Technical Measures, Legislative Measures and Other Measures, i.e. the measures that are not directly related to the lifelong education of construction workers but do have an indirect influence on the education of workers. Chapter Four gives a detailed presentation of the measures and the problems the particular measures are to solve.

At the 2nd National Counselling, the first draft of the National Roadmap was presented and a special stress was put on the proposed measures to be taken. Moreover, the proposed measures were additionally worked out, amended and assessed through three aspects as follows:

1. long-term effects of a measure;
2. scope/range/influence of a measure (regarding the number and the various nature of the sectors/users it is to influence)
3. acceptability of a measure (i.e. real odds that the measure is to be implemented as judged by the relevant/part-taking stakeholders)

The measures were as well sorted by priority by the NQP stakeholders and the measures have been further categorized accordingly (Table 9). Third NQP' s meeting was focused on interactive discussion of formal acceptance and practical implementation of the National roadmap.

Table 9 The evaluation of the priority measures**EVALUATION OF PRIORITY MEASURES**

- 3 (+++) is the most important- 2 (++) mid-important - 1 (+) the least important - zero (0) if an aspect is irrelevant for the measure -

MEASURE MARK	MEASURE	PRIORITY	LONG-TERM EFFECTS OF THE MEASURE	SCOPE/RANGE/ INFLUENCE OF THE MEASURE	ACCEPTABILITY OF THE MEASURE For the relevant/ part-taking stakeholders
GENERAL MEASURES					
GM-1	Education and lifelong education of the existing qualified (Q)workers in the fields of EE and RES	22	+++	+++	+++
GM-2	Workout of the CROSKILLS marketing plan for the purpose of popularization of the construction jobs	11	+++	+	+
GM-3	Training and lifelong education of the existing unqualified (UQ) workers in the fields of EE and RES	10	+	+	+
GM-4	Commencing an info campaign at the national level with the purpose of promoting EE refurbishment of buildings and the offer of licensed workers and certified companies in the realm of EE	6	+++	+++	+++
GM-5	Retraining and lifelong education as to EE and RES for both unemployed and employed construction workers	3	++	++	++
GM-6	Workout of the CROSKILLS marketing plan for the purpose of a lifelong education for workers	2	++	+++	++
GM-7	Establishing the administrative structure	1	+++	+++	+++
GM-8	Informing the employers with the possibility of use of the Croatian Act on Subsidies		++	++	+++

EVALUATION OF PRIORITY MEASURES

- 3 (+++) is the most important - 2 (++) mid-important - 1 (+) the least important - zero (0) if an aspect is irrelevant for the measure -

MEASURE MARK	MEASURE	PRIORITY	LONG-TERM EFFECTS OF THE MEASURE	SCOPE/RANGE/INFLUENCE OF THE MEASURE	ACCEPTABILITY OF THE MEASURE For the relevant/part-taking stakeholders
LEGISLATIVE MEASURES					
LM-1	Public tenders system – green public tenders, the obligation of employing certified workers (after the sufficient number of educated workers have entered the market) and the mechanism for protection of local performers	20	+++	+++	+
LM-2	Certifying/licensing construction workers after they have completed education courses (licensing an individual)	15	+++	+++	++
LM-3	Monitoring the bodies responsible for training (depriving them of authorization)	12	+++	+++	+++
LM-4	Monitoring the licensed companies and trades (depriving them of the license/charging fines)	6	+++	+++	+++
LM-5	Licensing of the companies and trades in the way that includes education obligation and the expiry of the certificate; Evidence/registry of companies and trades licensed to perform EE and RES works	3	+++	+++	+

EVALUATION OF PRIORITY MEASURES

- 3 (+++) is the most important - 2 (++) mid-important - 1 (+) the least important - zero (0) if an aspect is irrelevant for the measure -

MEASURE MARK	MEASURE	PRIORITY	LONG-TERM EFFECTS OF THE MEASURE	SCOPE/RANGE/INFLUENCE OF THE MEASURE	ACCEPTABILITY OF THE MEASURE For the relevant/part-taking stakeholders
TECHNICAL MEASURES					
TM-1	Development of the plan for a lifelong education for workers that are to construct nearly zero-energy buildings and refurbish the existing ones in terms of EE	23	+++	+++	+
TM-2	Training of experts who will train construction workers (Training of trainers)	16	+++	++	++
TM-3	Establishing the Registry of Educated Workers that is to be accessible to a wider public; updating the Registry, taking evidence on lifelong education	5	+	+++	++
TM-4	Including the construction products manufacturers into the process of educating construction workers	4	+++	+++	+++

MEASURE MARK	MEASURE	PRIORITY	LONG-TERM EFFECTS OF THE MEASURE	SCOPE/RANGE/ INFLUENCE OF THE MEASURE	ACCEPTABILITY OF THE MEASURE For the relevant/part-taking stakeholders
TM-5	Allocating financing sources and a systematization of the financial structure for educating labour force for the purpose of attaining the national EE objectives	4	+	+++	+
TM-6	Upgrading the process of practical work/practical segments of educational courses performed at the manufacturers' plants, building site or school workshops	2	+++	+++	+
TM-7	A continuous monitoring of needs for qualified labour force, special skills and vocations needed for fulfilling the EE plan	2	+++	++	++

EVALUATION OF PRIORITY MEASURES

- 3 (+++) is the most important - 2 (++) mid-important - 1 (+) the least important - zero (0) if an aspect is irrelevant for the measure -

MEASURE MARK	MEASURE	PRIORITY	LONG-TERM EFFECTS OF THE MEASURE	SCOPE/RANGE/ INFLUENCE OF THE MEASURE	ACCEPTABILITY OF THE MEASURE For the relevant/part-taking stakeholders
OTHER MEASURES					
OM-1	Revision and implementation of secondary school curricula for the vocations related to construction and refurbishment in terms of EE and RES	26	+++	++	+
OM-2	Legislation on EE performance quality control in the course of performance of works and prior to issuing operating licenses	23	+++	+++	+++
OM-3	Encouraging the creation of curricula for interdisciplinary vocations	3	+++	++	++
OM-4	Encouraging the clustering of expert business entities taking part in the construction processes and establishing professional associations (by the expert community)	3	+++	+	+++
OM-5	Taking part in the process (workgroup) for changing the legislative in the realm of dwelling and dwellers' proprietorship relations	1	+++	+	+
OM-6	Promoting the urban refurbishment (so-called placemaking, creating a pleasant place for living)	0	+++	+	+
OM-7	State-level subsidies for EE refurbishment of buildings	0	+++	+++	+

5. Measures

A division of the measures into the General (marked GM), Technical (marked TM), Legislative (marked LM) and Other (marked OM) follows. Other Measures are the measures that are not directly related to the lifelong education of construction workers but do have an indirect influence on the education of workers. There is the total of 27 proposed measures and each of them is clarified in more details.

5.2. General measures

Table 10 shows the list of the 8 General Measures and a detailed clarification of each of them follows the table.

Table 10 – General Measures list

GENERAL MEASURES	
GM-1	Education and lifelong education of the existing qualified (Q) workers in the fields of EE and RES
GM-2	Development of the CROSKILLS marketing plan for the purpose of popularization of the construction jobs
GM-3	Training and lifelong education of the existing unqualified (UQ) workers in the fields of EE and RES
GM-4	Commencing an info campaign at the national level with the purpose of promoting EE refurbishment of buildings and the offer of licensed workers and certified companies in the realm of EE
GM-5	Retraining and lifelong education as to EE and RES for both unemployed and employed construction workers
GM-6	Development of the CROSKILLS marketing plan for the purpose of a lifelong education for workers
GM-7	Establishing the administrative structure
GM-8	Informing the employers with the possibility of use of the Croatian Act on Subsidies
GM-1	Education and lifelong education of the existing qualified (Q) workers in the fields of EE and RES
GM-3	Training and lifelong education of the existing unqualified (UQ) workers in the fields of EE and RES
GM-5	Retraining and lifelong education as to EE and RES for both unemployed and employed construction workers

In accordance with the available data and in accordance with the experience from previous international project, there is not a sufficient number of workers in Croatia who would feature appropriate level of education in EE; even workers are aware of this fact. In accordance with the Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy, a continuous education scheme in EE in Croatia is performed at the level of graduated engineers. At the moment, there are no either organized lifelong education courses or workers and craftsmen licensing schemes. Only occasionally, at the national and regional levels, there are workshops and seminars dealing with constructing low-energy buildings but these cannot be considered a system of continuous learning. The existing materials and references in the field of lifelong education in the field of EE are the results of the activities of various organizations implementing international project but the materials do not specifically target construction workers and they are not systematically coordinated by the relevant institutions.

In accordance with the Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy, there are 37,600 workers to be trained for the purpose of attaining the national objectives in EE and RES. As it has been estimated, the afore mentioned workers fall into the two groups: there are approx. 21,600 of them dealing with the construction or refurbishment of buildings in terms of EE and approx. 16,000 of them dealing with installing and fitting the technical systems in terms of EE. The Ministry of Construction and Physical Planning passed the Ordinance on Conditions and Parameters of Recognizing System of Services and Performance Quality for the purpose of certifying the authorised RES/photovoltaic systems installers (Official Gazette 079/2013 and 085/2013).

The Measures exclude photovoltaic systems and wind power plants installers.

Based on experience, the attendants of focus groups proposed the following target groups to be educated:

- a. Qualified labour force
- b. Unqualified labour force
- c. Unemployed workers

A lifelong education process is needed for the following building envelope-related vocations:

- plasterer
- bricklayer
- carpenter
- wall painter/painter
- roofer
- dry-liner

A lifelong education process is needed for the following RES-related vocations (in accordance with [15]):

- biomass-burning systems installer
- heat pumps installer
- shallow geothermal systems installer
- solar panels installer

Within the GM1, GM2 and GM3, the outcomes of learning should be defined and the curricula should be redefined accordingly so that the education would be brought into conformity with the EE objectives in the construction sector, i.e. so that the workers could develop the required knowledge and skills to be used in the EE sector in building stock. The standard of qualification and professional competence required for gaining knowledge in the field of EE and RES should be brought into conformity with the Croatian Qualifications Framework, CROQF. As of the February of 2013, the Act on the Croatian Qualifications Framework – CROQF- was passed (Official Gazette 22/2013) [11]. The Act is an instrument of balancing the system and provides for clarity, for the approach to acquisition of qualifications, for the justified acquisition of qualifications, for the quality of qualifications, for mobility and for relating the levels of the Croatian qualifications with the levels stipulated in EQF and QF-EHEA (covers relations in university education), and, indirectly, with the qualification levels in QFs in other countries.

It is necessary to define the basic skills that are considered a priority and essential in the education of workers in EE and RES in the construction sector. The curriculum development should take into account the new materials, new technologies and methods of construction, new alternatives and general knowledge of building physics, as well as EE and RES. The Curriculum should give more emphasis on practical training to improve the skills of workers that are fundamental to the successful reconstruction of buildings and/or construction of nearly zero-energy buildings as well as the installation of technical systems in the field of energy efficiency (RES). The curriculum determines the duration of the program, material conditions, learning tools and personnel required for the implementation, evaluation and assessment, the number of hours on a weekly and yearly basis and the number of periods for the subject / module on a weekly basis. According to surveys and analysis of the construction sector [12] there are non-institutional courses on the market given by the company or manufacturers and/or distributors of new technologies. It is necessary to identify courses for specific activities or vocations that are accepted by the labour market but are not substantiated with proper qualifications and the taken courses are to be eventually recognized by institutions. Since the target group for the training of employees are employed skilled and unskilled construction workers and the unemployed construction workers, it is necessary to define the four programs for the certification of construction workers:

- Programs for lifelong education of qualified workers (QW) in EE:
- The training and lifelong education programs for the existing unqualified workers (UW)
- The retraining and lifelong education programs for the existing employed and unemployed workers
- Certification examination without a course taken (workers who have already completed courses offered by renowned companies producing construction materials should be granted the right to take exam and get the certificate, workers that have informal and nonformal skills).

The program for lifelong education must be flexible and continuously updated for new technologies and materials that appear in the market every day. There is no accurate yet relevant data on the number of workers and their qualifications operating on the black market from Croatia and neighbouring countries (Bosnia and Herzegovina, Montenegro, Macedonia, Serbia...), which constitutes one of the risks of unsuitable or inadequate skills required for the construction of zero-energy buildings and the renovation of the existing buildings [12]. Foreign workers have to be able to attend related education on Croatian language.

In the context of adult education, the relevant levels of CROQF for the training needs of construction workers are:

- Level 2 corresponds to a training lasting 1-3 month (for unqualified workers),
- Level 3 relates to the training for assistant jobs (low-skilled workers),
- Level 4 relates to additional education lasting 150-500 hours,
- Level 5 relates to master skills, for example a building site foreman,
- Levels 2 and 3 provides for the new skills acquisition (= training) for simple jobs,
- Levels 4 and 5 consider the enhancement of already existing skills (= specialization), for complex jobs.

In accordance with the Act on Croatian Qualification Framework, Chapter V, Acknowledging and Evaluation of Learning Outcome Group, Procedure of acknowledging and Evaluation of Previously Acquired Learning Outcomes Group, Article 15 prescribes the equity of the knowledge acquired formally and informally. A claim for acknowledgment and evaluation of previously acquired learning outcomes can be submitted by any individual to the legal entity or a person authorized for evaluation of learning outcomes in accordance with a verified program or with a learning outcomes evaluation procedure noted in the CROQF Registry. The procedure of applying, acknowledging and evaluating of both formally and informally acquired knowledge is ruled in details by the Ordinance on Acknowledging and Evaluating of Formal and Informal knowledge and it is exercised in accordance with the respective programs of evaluating learning outcomes group noted in the CROQF Registry. The quality of the procedure of acknowledging and evaluating learning outcomes group is ensured by authorized quality-ensuring institution that is in turn subjected to regular assessment of its quality-ensuring procedures. Based on the afore mentioned facts, the National Platform stakeholders considered it obligatory for unqualified workers to be included in Roadmap for lifelong education of construction workers in the field of energy efficiency as well.

GM-2 Development of the CROSKILLS marketing plan for the purpose of popularization of the construction jobs

The Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy gave a detailed analysis of the number of students attending the regular secondary VET school courses as well as the number of students that have completed three- or four-year courses (from 2006 to 2009). The analysis showed a lack of interest in students for the very vocations desperately needed for attaining the 20-20-20 objectives (namely, only 1 plasterer and 23 roofers in the period from 2009 to 2013).

To ensure a sufficient number of skilled construction workers in the future and in order to attract the required number of workers at the beginning of education, it is necessary to increase the attractiveness of the construction sector as a whole and improve the reputation of those vocations that are relevant to the EE refurbishment of existing and construction of nearly zero-energy buildings. In order to attract as large a number of students as possible to enrol VET courses, Croatian Chamber of Crafts and Trades pays a special attention to promotional activities within which the most significant event, "I want to be a master," is traditionally held every year as a promotion for VET and crafts. Unfortunately, these activities are not sufficient for directing students into the construction-related vocations. It thus should be emphasized within the "I want to be a master" activities that the increase in efficiency of the use of energy and the use of RES are an important part of various global and local strategies. Additionally, it should be emphasized that the building stock has been recognized as the sector with the greatest potential of reducing the overall energy consumption at the national level, which directly influences a more pleasant and quality dwelling in a building, the longevity of a building and contributes to the environment protection at the same time. In line with this, the construction vocations should be presented and promoted in the sense of its possibilities in EE and RES. Moreover, the marketing campaign should overcome the prejudices related to the construction vocations and encourage a more positive vision of the construction vocations in students when they are still in primary school.

GM-4 Commencing an info campaign at the national level with the purpose of promoting EE refurbishment of buildings and the offer of licensed workers and certified companies in the realm of EE

Promotional and information campaigns are intended for general public and prospective investors in the refurbishing of existing buildings or the construction of nearly zero-energy buildings. They would need to know the population and raise awareness of EE and RES. It is necessary to continuously develop the need for investments in the refurbishment of the buildings that are most important for the use of energy. According to the Directive 2012/27/EU on energy efficiency (EED) [16], Croatia is obliged to annually renew 3% public-sector buildings. Investment in the refurbishment will result in the return of additional expenses together with consequent savings due to reduced energy consumption. To encourage citizens to rationalize the energy management, it is necessary to devise a permanent promotional work through all of the media: newspaper ads, TV commercials, brochures, jumbo posters and the Internet. A part of the campaign should focus on the young, especially the school population.

The marketing campaign must first inform and raise awareness of the critical mass of citizens on EE and RES where the end-users are to be informed and their awareness raised about the economic, quality of life and better quality environment once the EE refurbishment of buildings or the construction of nearly zero energy buildings has been completed. In addition, the marketing campaign is necessary to overcome the prejudices that are tied to construction-related vocations and to highlight the advantages of certified workforce. As a part of the marketing campaign, it is necessary to inform the public about companies that offer certified workers.

GM-6 Development of the CROSKILLS marketing plan for the purpose of a lifelong education for workers

Construction companies and their employees must be familiar with the educational opportunities tailored to their needs and desires. For the purpose of a successful branding and implementation of Build Up Skills Pillar II project which consists in education of workers in the field of EE in building stock, it is necessary to establish information mechanisms for target groups that would make them more familiar with the possibilities of lifelong education.

It is necessary to collect all the information about the educational opportunities at a central interdisciplinary portal that will be available to the general public. The portal should provide all the information concerning the training program provider, lifelong education as well as the advice for lifelong education in the field of EE in building stock.

By Croatian accession to the European Union on July 1, 2013, the labour market has been opened for certified workers. In order to emphasize the need for educated workers, it is necessary to further emphasize the objectives Croatia strives to attain and opportunities that are opening up with the additional education:

- Certified workers are more appreciated and they are more wanted, i.e. they are important in the labour market
- The opportunities for employment are more favourable on both local and abroad levels as a certified worker is in conformity with CROQF

The marketing campaign should be, besides workers, directed at employers as well, and at the benefits from the educated workers:

- quality labour force,
- competitiveness in the labour market,
- benefits and/or tax reliefs through state subsidies,
- the promotion of a company, which attracts quality labour force,
- loyalty, commitment and motivation are encouraged and a higher productivity of workers is induced

The marketing campaign should additionally include investors, policy makers, financial institutions and other stakeholders and should emphasize the advantages of certified workers in one hand and legal 2020 obligations accepted by Croatia [16] in the other hand.

GM-7 Establishing the administrative structure

An effective implementation and monitoring of the lifelong education of workers can be carried out if there is evidence of certified workers and training agents, which indicates the need of establishing administrative structures for monitoring and maintaining the database. The scope of the administrative structure includes:

- Definition of the conditions and criteria for the granting, renewal, validity, amendment and revocation of certificates of construction workers and businesses and trades in the EE and RES;
- Developing and updating of the Registry of Education Program Providers;
- Developing and updating of the Registry of Certified Construction Workers;
- Education program and lifelong education options in the field of EE in building stock

GM-8 Informing the employers with the possibility of use of the Croatian Act on Subsidies for Education and Training

By means of the Act on State Subsidies for Education and Training (Official Gazette 109/07, 134/07, 152/08) [40] conditions and rules are established in terms of granting state subsidies for education and training of workers. The tax regulations are stimulating because they allow tax exemption for employers which invest in their employees in the form of training, retraining, additional training to specialization. These expenses are not liable to taxing because they are not considered as workers' income and thus there are no financial liabilities to the State. The Croatian Act on Subsidies for Education and Training provides more substantial tax reliefs for SMEs than to large employers. Thus Article 3 of the Act proposes that the tax base for a large employer could be reduced for up to 50 % of eligible costs of general education and education of workers and for up to 25 % of the costs of a specialist education. As to SMEs, the profit or income tax base could be reduced for even up to 70 % of costs of general education and training of workers and for up to 35 % of costs of a specialist education. Unfortunately, employers do not take the advantages of subsidies and it is partly due to a lack of knowledge of their subsidy rights and partly due to a lack of motivation. Consequently, Croatia is almost always in the end or somewhere near the end of any list showing the investments in education of workers. As one of the measures to implement is an urge on employers to start to use the tax reliefs for education/training of their workers. The info campaign on lifelong education of workers should also emphasize once more the advantages and subsidies gained due to providing education/training for workers.

The following table presents the preliminary SWOT analysis of the general measures:

STRENGTHS	WEAKNESSES
Satisfying the need for workers - no need to import labour force	Slowness and ineffectiveness of the administrative structure
Competitiveness in the labour market	Inability of overcoming the prejudices related to the construction vocations
Rising the level of the awareness of workers of the importance of quality performance and special materials	
Establishment of a unified education system for lifelong education of employees in EE	
Market recognition and evaluation of workers	
OPPORTUNITIES	THREATS
Gaining the importance of construction vocations and raising interest for them in the perception of the public and students	The marketing campaign on lifelong education has not spread enough among workers
Greater employment opportunities locally and abroad	Employers could resist the employment of educated certified workers
An advantage in the labour market	
Opportunity for education and retraining for the unemployed labour force and greater employment opportunities	
With the use of subsidies for education of workers, employers get educated and skilled labour force	
Employers who provide education for their workers encourage loyalty, motivation and a higher productivity of workers is induced	

5.2. Legislative Measures

Table 10 shows the list of the 5 Legislative Measures and a detailed clarification of each of them follows the table.

Table 10 Legislative Measures list

LEGISLATIVE MEASURES	
LM-1	Public tenders system – green public tenders, the obligation of employing certified workers (after the sufficient number of educated workers have entered the market) and the mechanism for protection of local performers
LM-2	Certifying/licensing construction workers after they have completed education courses (licensing an individual)
LM-3	Monitoring the bodies responsible for training (depriving them of authorization)
LM-4	Monitoring the licensed companies and trades (depriving them of the license/charging fines)
LM-5	Licensing of the companies and trades in the way that includes education obligation and the expiry of the certificate; Evidence/registry of companies and trades licensed to perform EE and RES works
LM-1	Public tenders system – green public tenders, the obligation of employing certified workers (after the sufficient number of educated workers have entered the market) and the mechanism for protection of local performers

As an example that the private sector is to follow, the public sector should use certified workforce in the refurbishment of existing public buildings. A key challenge in the public sector is to highlight the benefits of using certified workers and quality performance when calling for public tenders. During the announcement of public procurement, most decisions on procurement of goods and services are made on the basis of the purchase price, without taking into account either the full life cycle cost of the goods/services or the quality of the installed product/service used. The public administration can induce changes in the market and direct it towards the production of sustainable products and services, reduce the negative impact on the environment by reducing resource consumption in the production process and at the same time, in line with corporate social responsibility and take care of the local community, social justice and economic security through an increase the quality system.

UNDP has initiated a green public procurement with partners, the Ministry of Economy - Directorate for Public Procurement System, the Office of the central procurement, Croatian Standards Institute (CSI), Croatian Accreditation Agency (HAA), Association of Cities and JAV.NA - NGO Trainers Association and specialists in public procurement to promote sustainable public procurement. The aim was to improve the management of public budgets and client business bidders in public procurement system. The project released a handbook *Procura + Guide to Cost-Effective Sustainable Public Procurement* [18] which provides a clear and understandable guidance on the implementation of sustainable procurement practices and are given guidance on how to include the new certified workforce in the labour market.

As one of the measures, the use of certified labour force in public procurement has been proposed. The “energy-efficient” public procurement will enable a faster entry of certified construction workers into the refurbishing activities and it is expected that employment of certified construction workers will eventually be taking place on a broader level.

In order to protect domestic producers, contractors, businesses and trades from dumping, it is to be determined through associations or organizations that a product or service offered by a single contractor, manufacturer, company or craft cannot offer a price that is 20% (or more) lower than the highest prices in the domestic market.

LM-2	Certifying/licensing construction workers after they have completed education courses (licensing an individual)
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In order to promote the construction vocations in the EE realm, a special additional emphasize should be put on the opportunities and the importance of an educated worker and its career. The acquisition of the skills necessary for the EE construction should gain greater importance for workers and provide for them the (vocation) title: “A certified employee in the EE Construction” within the CROQF. This would add to the

importance of building vocations and would be in line with the work on gaining a better reputation and more attractiveness of the construction sector. In consultation with members of the National Platform, it was determined individuals should be licensed.

LM-3 Monitoring the bodies responsible for training (depriving them of authorization)

One of the proposed measures is monitoring of Education Providers in case of its failing to comply with some of request as to the conditions of training imposed by a superior institution and, if needed depriving the Provider of the authorization.

LM-4 Monitoring the licensed companies and trades (depriving them of the license/ charging fines)

In accordance with the Act on Architecture and Engineering Works and Activities in Physical Planning and Construction (Official Gazette 152/08, 124/09, 49/11, 25/13) [19], the refurbishing of buildings falls into the less complex works that do not require expert supervision but consents/licenses are issued for their performance however. This is why a stiffer supervision over the afore mentioned works performed by certified companies and trades and where it applies, the certificates can be revoked and/or fines charged. Moreover, it has as well been proposed that criminal and misdemeanour codes should apply in case of misuse of licensed workers and/or breaching the conditions of employment of certified workers that completed respective training (the working conditions in a company do not comply with the registered ones, etc).

LM-5 Licensing of the companies and trades in the way that includes education obligation and the expiry of the certificate; Evidence/registry of companies and trades licensed to perform EE and RES works

In accordance with [19], for a reconstruction and/or refurbishment of buildings (Group I), at least two employees are needed out of which at least one fulfils all the requirements for a foreman. The requirements for a foreman are master exam and the acknowledged master status or a higher education in the field of construction completed. The technical requirements have been worked out but more rigorous approach is proposed, namely, a widening of the requirements scope for the EE realm.

As one of the measures, the licensing of companies and trades has been proposed with the prerequisite of the employment of certified workers who completed the respective training course(s) and of taking the companies/trades into the Registry of the companies/trades licensed for performances in the field of EE and RES.

The following table presents the preliminary SWOT analysis of the legislative aspect of the Roadmap

STRENGTHS	WEAKNESSES
Great potential for EE refurbishment of the existing public buildings	A slow public procurement procedure if the certified labour force is a condition
Quality renovation using EE licensed labour force	
OPPORTUNITIES	THREATS
Opening of business opportunities in the field of the refurbishment reconstruction of the existing buildings	A lack of will or a lack of knowledge about the possibilities of using the services of certified labour force in public procurement
Opening of business opportunities for the licensed companies that employ certified workers	Slow administration
	Substandard work of education providers
	Failure to implement monitoring over the licensed companies

5.3. Technical Measures

Table 11 shows the list of the 7 Technical Measures and a detailed clarification of each of them follows the table.

Table 11 Technical Measures list

TECHNICAL MEASURES	
TM-1	Development of the plan for a lifelong education for workers that are to construct nearly zero-energy buildings and refurbish the existing ones in terms of EE
TM-2	Training of experts who will train construction workers (Training of trainers)
TM-3	Establishing the Registry of Educated Workers that is to be accessible to a wider public; updating the Registry, taking evidence on lifelong education
TM-4	Including the construction products manufacturers into the process of educating construction workers
TM-5	Allocating financing sources and a systematization of the financial structure for educating labour force for the purpose of attaining the national EE objectives
TM-6	Upgrading the process of practical work/practical segments of educational courses performed at the manufacturers' plants, building site or school workshops
TM-7	A continuous monitoring of needs for qualified labour force, special skills and vocations needed for fulfilling the EE plan
TM-1	Development of the plan for a lifelong education for workers that are to construct nearly zero-energy buildings and refurbish the existing ones in terms of EE

A scheme for the certification of construction workers for constructing nearly zero-energy buildings and the refurbishment of the existing ones is to be developed. The plan should include:

- The conditions and criteria for certifying construction workers as to EE
- The qualification and work experience required for attending a training course
- The content and the mode of performing of a training program
- The content and the mode of knowledge assessment
- The content and the mode of performing the lifelong education,
- Monitoring over the performance of certified workers, depriving of authorization
- The Registry of certified construction workers
- The conditions and criteria for issuing the consent for performing lifelong education program for workers that are to construct nearly zero-energy buildings and to refurbish the existing buildings in terms of EE,
- The obligations of the Licensed Training Institution
- Monitoring over the performance of the Licensed Training Institution, depriving of authorization
- The Registry of Licensed Training Institutions

TM-2 Training of experts who will train construction workers (Training of trainers)

Teachers and staff that would perform training must have the personal and professional competences in EE and RES. A trainer should have the professional and educational competences for training the workers. The analysis of educational programs in vocational schools reveals a lack of programs that deal with energy efficiency. At the VET Agency level, since 2008, a program of lifelong education for the teachers of the construction vocational subjects exists, with topics related to RES and EE; there have been professional conferences for the teachers and they are moderated by various professional associations (The Croatian Chamber of Architects, The Association of Graduated Engineers and Technicians

in Construction etc.). However, at the level of informal education, there are no programs of training the trainers for the existing workers in EE and RES fields.

The “Training of Trainers” Measure recommends a systematic training together with knowledge and skills upgrading of teachers in the field of EE and RES that could disseminate the acquired knowledge and skills to workers. Teachers can upgrade their knowledge on new skills and materials by means of the cooperation with the construction industry experts. Namely, secondary school teachers feature the educational knowledge important for the knowledge transfer from a teacher to students (workers) whereas the industry experts feature the technical knowledge and skills required for constructing and refurbishing buildings in terms of EE and RES. Within the training of trainers, it is important:

- to investigate the knowledge and skills required for trainers to train the teachers who are in turn to train workers.
- to draft the curriculum and the content for training of trainers program, devise the needed materials etc.
- to devise the framework possibilities of the lifelong education for trainers (periodically, every 5 years)
- to create WEB pages containing all information needed for training of trainers
- to implement a pilot project as to the education on the way of knowledge assessment in the training for trainers program.

TM-3 Establishing the Registry of Educated Workers that is to be accessible to a wider public; updating the Registry, taking evidence on lifelong education

One way of promoting licensed construction workers is to establish a register of workers certified in EE. The objective of a centrally coordinated database is an easier and quicker contact of investors, construction companies and companies with the licensed labour force that is educated and knows the methods and has the skills for the EE construction. With the establishment of the register, it is necessary to update the newly educated workers and keep a record of the lifelong education.

TM-4 Including the construction products manufacturers into the process of educating construction workers

In cooperation with renowned manufacturers, it is necessary to define the trends that occur in the production of building products for the refurbishing of the existing and the construction of nearly zero-energy buildings. The Manufacturers of construction equipment set standards and equipment development continues rapidly and requires a contractor to continuously keep pace with the development of new technologies. Many manufacturers are constantly investing in the further development of construction technologies and thus organize some practical seminars and courses. It is necessary to involve producers in the process of education so that their knowledge, skills and technology could contribute to the practical part of the training of workers. By means of the manufacturers of the construction equipment being involved, costs are reduced whereas the producers that are as well involved in the education system have an opportunity as well to present their technologies and to work on the development of the reputation of their companies.

TM-5 Allocating financing sources and a systematization of the financial structure for educating labour force for the purpose of attaining the national EE objectives

One of the possible causes of poor quality performance of the refurbishment of the existing and the construction of new nearly zero energy buildings may lie in the lack of motivation for lifelong education. The economic situation will not allow workers and their employers the additional funds and time needed for learning. The market still does not require either specialist training or separate licensing of construction workers so there is not any motivation on the part of workers and employers for investing additional funds in training. In this way, the workers are in a different position from engineers whose lifelong education is compulsory and thus makes them more competitive in the market.

In order to attract a certain number of workers to education, the members of the National Platform believe that the first years of education should be available to everyone and, in other words, free of charge.

In a long run, it is necessary to develop a form of financing of continuing training of workers.

One of the possible forms of co-financing the education workers is through the Croatian Employment Service (CES), and the scheme is intended for employers to encourage the employment of workers. There is also the possibility of co-financing the education (100%) of unemployed workers registered with the Croatian Employment Service in case of the educational programs demanded on the labour market if the consequent qualifica-

tions are needed in plans for the current year with the use of public procurement procedures. Within the scope of the functioning of CES, there is also a supporting measure dubbed "Knowledge pays for the Employed As Well". Namely, it is a co-financing scheme for the education of the employed in the market environment in which new technologies are introduced, higher standards applied and the manufacturers' production ranges changed. The Measure aims at keeping the jobs for the workers who have worked for one and the same employer for a long time and, when the employer deploys the new or more sophisticated technologies, the level of knowledge and skills of the workers do not guarantee keeping the job. The measure is applied in the circumstances where the employer introduces a new standard or has a legal obligation to raise the level of qualifications of the existing labour force (conformity with the EU legislation in a particular activity). This measure is aimed at raising the level of qualification of the employed labour force and at enabling the acquisition of knowledge and skills for employees in the situation when new products and new technologies are introduced by the employer. It also influences the rate of keeping the jobs for the persons who have not completed secondary education, persons with disabilities; persons of older age and other persons for whom losing the job would mean a long-term unemployment. The target groups of this support are employed persons who are at risk of losing their jobs due to changes in the production program, the introduction of new technology and higher standards, the employed persons over 50 years of age who are at risk of losing their jobs because their employers are introducing new production programs or new technologies. The subsidy for training amounts up to a maximum of 35% of the eligible costs of a specialist training for small and medium-sized employers, up to a maximum of 25% for large employers and up to 70% for general training for small and medium-sized employers and up to 60% for large employers. In addition, CES performs co-financing through the measure "Knowledge Pays for Employed As Well". The aim of the measure is to increase the employability of the unemployed by means of education and creating the necessary skilled labour force, as well as reducing the discrepancy between the supply and the demand at all levels of the labour market. By means of educational programs, people change jobs, acquire new knowledge and professional skills and upgrade their competences and position in the labour market. An adequate training for those who are unemployed for a long time and other vulnerable groups of the unemployed, the level of qualification is raised and it eliminates the risk of long-term unemployment; it as well has an influence on the development of attitudes about the need for lifelong education. The target group are the unemployed, regardless of the years of work experience, occupation and qualification (those listed in the unemployment register).

Another possibility of financing is through the European Social Fund (ESF), which is dedicated to promoting employment. Some of the activities that can be financed from PE funds are: encouraging investment in human resources, improving the skills of the labour force through lifelong education, innovation and entrepreneurship, ICT (information society) and management skills training, vocational guidance, training of trainers in various professional fields etc. and the adjustment to the changes in economies and productive organization of work, targeting knowledge and skills, employment and training (restructuring).

A new EU program for education, training, youth and sport proposed by the European Commission is Erasmus for All. The program is open to all private and public entities active in the areas of education, training, youth and sport. The program supports formal and informal learning activities of all sectors. Erasmus for All would bring together all the current EU and international programs and initiatives for education, training, youth and sport (Lifelong education Programme: Erasmus, Leonardo da Vinci, Comenius, Grundtvig, Youth in Action, Erasmus Mundus, Tempus, Alfa, Edulink and program of bilateral cooperation), thus replacing seven existing programs with one.

The fourth option is the involvement of companies manufacturing the construction equipment and technology into the education system via the co-financing by their workers and / or the use of their equipment and / or for practical education.

The fifth option is an employer financing the education whereas the sixth one is self-financing.

TM-6 Upgrading the process of practical work/practical segments of educational courses performed at the manufacturers' plants, building site or school workshops

A major problem in the education of students is the content and organization of the material in terms of training and skills in the performance of the building envelope or installing energy efficient carpentry or joinery. While it is possible for schools that have appropriate workshops to arrange for trainings performed by teams from various companies dealing with EE or producing construction materials, a bigger obstacle are the students who do their practical work at independent outer employers who may not have the EE material and equipment fitting in their production range and either may not have the EE educated employees or/and do not make use of the contemporary technologies in construction. It is likely that it would be necessary for this type of population to be provided with practical work and opportunities to perform the building envelopes, i.e. to fit certain equipment. This could be done in certain didactic blocks lasting 10 to 15 days creating practical training for workers. It will be implemented in the form of courses that are to involve various trainers who could train the students at the technology centres of their own, at school workshops or at the premises of material producing companies. As to the adult education, as it has already been said, training and skills are necessities and the only way is to organize courses and involve trainers in the field of energy efficiency. This will include practical education at the very building sites or at the technology centres of large material-producing companies or at the workshops of the referential schools that offer regular courses in the relevant vocations.

TM-7 **A continuous monitoring of needs for qualified labour force, special skills and vocations needed for fulfilling the EE plan**

It is necessary to centralize the monitoring of the necessary skills and vocations in VET and in the labour market in the construction industry within one institution (such as the VET Agency) that could implement the skills that are lacking into the education process or warn the structures when inadequate skills are deployed in the use of EE measures or RES technologies. The VET Agency should as well take into consideration the opinions and proposals concerning inadequate or "risky" knowledge and skills given by other institutions (the Croatian Chamber of Crafts and Trades, Croatian Employment Service, the Ministry of Construction and Physical Planning). As the afore mentioned institutions are in a close contact with the situation in the field in construction sector, this would be altogether conducive to the attaining of the national EE objectives.

The European Employment Observatory (EEO) contributes to the European Employment Strategy (EES) through providing information, performing comparative studies, evaluating employment policies and labour market fluctuations in 33 countries. The European Employment Observatory issued the publication "Promoting green jobs throughout the crisis: a handbook of best practices in Europe" [20]. In the publication, there is an analysis of the state of green jobs in Croatia. The state of green employment should be regularly updated (once a year). In the scope of this Measure, the green employment state updates should be monitored and EEO should be contacted so that the regular reports on the fluctuations in the green jobs market could be obtained.

The following table presents the preliminary SWOT analysis of the Technical Measures

STRENGTHS	WEAKNESSES
<p>The lifelong education of designing engineers functions well and can be used as the model for education of workers</p> <p>Involvement in the lifelong education gives the Croatian manufacturers have the opportunity to present their technology and to work on developing the company's reputation</p> <p>The Registry of the workers who completed the education program(s) is available to the wide public</p> <p>The upgrading of the skills of trainers is to raise the level of professionalism in the education programs for students and workers</p>	<p>Data and knowledge have to be constantly updated by trainers</p> <p>A lack of quality of taking evidence on the workers who completed education programs</p>
OPPORTUNITIES	THREATS
<p>Training of trainers enhances the quality of the programs for lifelong education of workers in the field of EE</p> <p>Upgrading the practical education upgrades the EE skills of workers and they thus become more competitive in the labour market.</p>	<p>Resistance to the changes in practical education</p> <p>Failure of relevant institutions to implement the monitoring over necessary EE skills</p> <p>Economic reasons for workers' failure to attend education programs</p>

5.4. Other Measures

Table 12 shows the list of the 5 Other Measures and a detailed clarification of each of them follows the table.

Table 12 - Other Measures list

OTHER MEASURES	
OM-1	Revision and implementation of secondary school curricula for the vocations related to construction and refurbishment in terms of EE and RES

OM-2	Legislation on EE performance quality control in the course of performance of works and prior to issuing operating licenses
OM-3	Encouraging the creation of curricula for interdisciplinary vocations
OM-4	Encouraging the clustering of expert business entities taking part in the construction processes and establishing professional associations (by the expert community)
OM-5	Taking part in the process (workgroup) for changing the legislative in the realm of dwelling and dwellers' proprietorship relations
OM-6	Promoting the urban refurbishment (so-called placemaking, creating a pleasant place for living)
OM-7	State-level subsidies for EE refurbishment of buildings

Some of the important measures recognized by the National Platform are labelled OTHER MEASURES because they are not directly related to lifelong education of workers and they are explained below.

OM-1 Revision and implementation of secondary school curricula for the vocations related to construction and refurbishment in terms of EE and RES

Although secondary education of construction workers and installers usually does not last more than 3 or 4 years, together with a lot of unskilled workers, VET schools for construction workers and schools for adult education are not specifically focused on energy efficiency and renewable energy as part of their curricula. As the respective measure, the participants of the National Platform proposed that the students should be trained at secondary schools –as the future construction workers who need to focus on EE and RES. The VET Agency takes care of aligning education with the needs of the labour market. The Sectoral Council of Construction and Geodesy functions within the VET Agency and its task is to monitor the development of new technologies, skills and knowledge so that they can be implemented in curricula. The Council is authorised for establishing the standard of qualifications, vocations and curricula for particular education programs.

As to the three-year programs, it is necessary to review the vocational part of the curricula for all the construction vocations, for the installer vocations in engineering, as well for painters and joiners. The Consortium gathered in the project CROSKILLS should call for an initiative of the Ministry of Science, Education and Sports to accept the revision of educational curricula for all the vocations that are relevant for this project.

In the curricula of the three-year programs of the integral educational model (IEM) for bricklayer, carpenter and roofer, in the vocational part of the curriculum, besides the Building Constructions subject in the 1st and the 2nd grades that could be enriched by EE and RES content, there is as well an additional weekly period of Technology within which educational content on the new EE-attaining construction technologies can be introduced. This single period is in the time-table in each of the three years of the courses and thus, for the purpose of an even distribution of the EE content, in the 1st grade there could be general overview of the problems of buildings and the energy generated from the fossil fuels as well as of the ways of keeping the generated energy; in the 2nd grade, there could be details introduced about the insulation gained by the building envelope and about air tightness; in the 3rd grade, (where the subject is intended to deal with renewal and reconstruction of buildings), there is some space left for the contents indicating the EE properties of the already existing buildings. The vocations such as floor layer, dry-liner and especially plasterer are in the classical education model and they do not have the optional 3rd period of Technology weekly. However, they do have 2 periods per week of the regular subject Technology of the Vocation within which some radical changes are to be made in terms of the EE content.

As to the curricula in installation engineering, especially for the heating and air conditioning systems fitter vocation, there is the optional subject Solar Collectors Technology with one period per week in the 2nd grade and two periods per week in the 3rd grade. However, these contents are insufficient for the entire scope of works that are to implement RES and the students are not familiar with them, not even at the informational level and it is especially so for heat pumps, wind energy and energy from biomass. The educational content in this subject is closely related to electricity obtained from the photovoltaic arrays only. However, even with the existing number of periods or with a possible increase by one period a week, students could get acquainted with other aspects of the use of energy from the RES. As to the program for carpenter in the wood processing sector and for painter there is a possibility of increasing the number of periods dealing with EE within the vocational part of the curricula.

What is to be pointed out again is a certain defensive attitude toward implementing these important vocational education content into programs, so it seems that the very top of the educational pyramid should be contacted as to it, but, of course, with a prior consultations with the Employer's Association, VET Agency, the Ministry of Education, Science and Sports and with the Sectoral Councils as the confirmation of the revision of the vocational content is needed.

With the implementation of the curriculum, it is as well proposed that the construction-related vocations should be promoted and students encouraged to enrol into vocation within the EE and RES frameworks; moreover, it is proposed that the vocational education system for EE and RES in building stock should be upgraded via the VET Agency as it is a National Qualification Platform member.

OM-2
Legislation on EE performance quality control in the course of performance of works and prior to issuing operating licenses

Quality control plays an important role in achieving the EE and RES objectives. Given that, according to [19], less complex works do not require supervision but the respective consents/licenses for their performance are required, the NQP participants recommended a stricter supervision of the construction and refurbishment of buildings and especially in terms of the energy aspects.

To ensure the quality of performance of works, it is necessary to make a series of tests. One of the tests is to check the condition of the building envelope in accordance with the Croatian Norm Standard (HRN EN 13829:2002 Thermal performance of buildings through the determination of air tightness) – is the so-called Blower Door Test) [21]. The air tightness of the building envelope affects the fulfilment of the essential requirements for the building in terms of energy savings and contributes to a significant extent to the heat losses of buildings, especially in buildings with a higher degree of thermal insulation than required by the Technical Regulation on the Rational Use of Energy and Thermal Insulation of Buildings. The air tightness testing provides for measurable data on the condition of the building envelope and, in combination with IR thermography, can result in a quality assessment of the building envelope condition.

Despite the fact that it is governed by regulations, in practice, the air tightness testing is rarely performed and this is partly due to failure of knowing the regulations, partly due to a lack of control and partly due to failure of obeying the regulations in construction. The enforcement of the construction-related regulations is a major problem in Croatia. Although the legal framework has been given by means of the Physical Planning and Construction Act (Official Gazette 76/2007, 38/2009, 055/2011, 90/2011, 50/2012, 55/2012, 80/2013) and the respective regulations concerning EE and energy certification of buildings, the system of monitoring over the enforcement of the regulations in the construction performances should be upgraded. The implementation of building regulations is a major problem in Croatia. Although the legal framework exists in the form of the Physical Planning and Construction together with its regulations relating to energy efficiency and energy certification of buildings, implementation and monitoring system of building regulations should be improved. A full implementation of the EPBD (Energy Performance of Buildings Directive) provisions into the national legislative framework will ensure the adoption of integrated standards of energy performance of buildings. The Roadmap proposes upgrading the control system and requires testing of the building envelope performance prior to the issuance of the operating license.

OM-3
Encouraging the creation of curricula for interdisciplinary vocations

Technician for Sustainable Construction is an interdisciplinary vocation and as such is a necessary resource in the field of EE construction and the use of RES and ecologically acceptable energy sources. At the same time, a Technician for Sustainable Construction is an expert in the refurbishment for the vast number of already existing buildings that needs both protection and energy enhancement and an expert in viable waste management.

Within the Roadmap, the encouraging of creating the curricula of similar interdisciplinary vocations such as:

- Foreman at the building site
- Technician for Energy Efficient Construction (deals with the EE in construction only, without the recycling of the construction waste materials).
- Insulator etc.

OM-4
Encouraging the clustering of expert business entities taking part in the construction processes and establishing professional associations (by the expert community)

Professional business entities dealing with construction should be encouraged to join associations (clusters), which then increases the competitiveness of each company within the cluster and thus the competitiveness of the cluster itself.

Associations protect the rights of the respective vocation and promote quality. The more members there are in an association, the stronger the association is and it can influence the legislative. Therefore, the establishing of professional associations such as the association of plasterers is proposed. Professional associations are in turn to determine the conditions for the practical part of education courses.

OM-5 Taking part in the process (workgroup) for changing the legislative in the realm of dwelling and dwellers' proprietorship relations

As one of the major problems that participants in the focus groups (the National Qualification platform) indicated is the regulation requesting a 100 percent agreement of all co-owners of the building in case of refurbishment or any major reconstruction of the building. Because of this and because of the bad practices and arbitrariness of individuals in the building, it is difficult to reach agreement on the reconstruction/refurbishment works on façades or roofs. Therefore, it will be difficult to create a need for licensed workers in the market.

One of the measures proposed is joining the process (workgroup) that is to change the legislation regarding housing and the respective proprietary relationships (Act on Proprietorship and Other Property Rights – Official Gazette 91/96, 68/98, 137/99, 22/00, 73/00, 129/00, 114/01, 79/06, 141/06 and 146/08 [22], as well as participating in the development of the Housing Act). It is necessary through involvement in the process of changing of regulations to point out the obligation of the building manager to provide for an authorized persons to perform EE refurbishment, parcelation etc. Furthermore, the requested percentage of co-owners needed for reaching agreement as to major investments into their building should be reduced to 75 %, at least.

OM-6 Promoting the urban refurbishment (so-called placemaking, creating a pleasant place for living)

Placemaking is a multi-directional approach to the planning, organization and management of public areas. It implies involvement in the planning process of those who live, work or reside in a certain area and it implies listening to those people and asking them what their needs and desires are. This information then can be used for creating a shared vision for the place. The vision could be in turn easily developed into a strategy for implementation starting with small, feasible improvements from which the public area and the people who use it can benefit immediately. Placemaking involves a coordination of various stakeholders during regeneration of a public area: space planning, coordination, education, urban equipment with the use of RES, refurbishing of the facade, cooperating with the local community. The European Regional Development Fund (ERDF) will allocate 5 % of the funds to the activities on urban renewal. Promoting placemaking is proposed, i.e. the regeneration of public areas as a form of advertising that is financed from the EU funds.

OM-7 State-level subsidies for EE refurbishment of buildings

The demand for energy-efficient products and services can be stimulated as well by means of the appropriate legislative framework, the schemes of energy labelling of buildings and devices that use energy, energy audits and consulting, but mostly by means of offering subsidies for the implementation of technical measures of energy efficiency.

There are some local self-government that provide reliefs or subsidies for the construction of very low energy buildings energy buildings. This is, for example, Town of Koprivnica which offers a relief from utility charges or other fees, namely 50% lower municipal contribution in case of construction of low-energy buildings and a 100% lower municipal contribution in case of construction of passive buildings; Town of Križevci offers a 50 % relief of municipal contribution in case of the construction of passive buildings and a 25 % relief of municipal contribution in case of the construction of low-energy buildings; Town of Delnice finances 100% of interest on refurbishing-intended loans given to individuals in case of performance of thermo facades, snow guards, roof constructions, joinery; Energy Agency REA Kvarner co-finances performances through "Green Energy in My Home" sweepstakes; The Zadarska and the Vukovarsko-srijemska Counties co-finance the installing of solar panels, etc.. However, the afore mentioned subsidies are not present to an extent that would yield some considerable results.

One of the measures thus proposed is encouraging a state-level (co) financing of energy efficiency in households.

The following table presents the SWOT analysis of the Other Measures:

STRENGTHS	WEAKNESSES
The introduction and implementation of the curricula in secondary schools within the EE	Slowness in the implementation of curricula in secondary VET schools
New potentials of the use of funds from the EU	
Introducing subsidies will increase the demand for EE refurbishing of buildings, i.e. for certified workforce	
OPPORTUNITIES	THREATS
Improved employability for students after completing secondary school courses	Resistance to the changes in practical education
Upgrading of the practical education in EE makes the students more competitive in the labour market	Resistance to the control of the quality of performance
The change in the Act on Proprietorship and Other Property Rights provides for a higher rate of the refurbishment of buildings	Slowness in passing the Housing Act

6. Action plan

The following chapter gives an overview of the action plan for implementing the measures along with the activities and steps to be taken in order for the particular measure to be implemented, i.e. the steps, the contributors/task performers, deadlines/time-span for the implementation, the resources required and some possible additional prerequisites.

GENERAL MEASURES (GM)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR PLENTIFICATION	DEADLINE/ TIME- SPAN
GM-1	Education and lifelong education of the existing qualified (Q) workers in the fields of EE and RES	<p>A1: Meetings with the relevant manufacturers and contractors in order to define the necessary skills</p> <p>A2: Meetings of the relevant stakeholders (from industry, schools and the VET Agency)</p> <p>A3: Defining the learning outcomes of the various skills and occupations</p> <p>A4: Developing the curriculum for the training of the existing qualified workers</p> <p>A5: Conducting a pilot project for training of existing qualified workers</p>	CROSKILLS Consortium	Funding for the development of the curriculum; Human resources; Funding for the practical education; Funding for printing the handbook (through project Build Up Skills Pillar II)	-	2014-2015 (in the course of the implementation of Build Up Skills Pillar II)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PRE-REQUISITES FOR PLEMEN-TATION	DEADLINE/ TIME- SPAN
GM-2	Development of the CROSKILLS marketing plan for the purpose of popularization of the construction jobs	A1: Establishing the marketing team A2: Finding the source of funding A3: Making the marketing plan (4 marketing plans – for users, investors, craftsmen and students) A4: Designing the promo materials A5: Campaign Launch (additional promotion by the Employers' Association, the Croatian Employment Service ...)	CROSKILLS Consortium and the MCPPP (Ministry of Construction and Physical Planning)	Human resources; The financial resources required for design, printing and distribution of promotional materials (funding through the Environmental Protection and Energy Efficiency Fund)	-	Simultaneously with the start of Build Up Skills Pillar II)
GM-3	Training and lifelong education of the existing unqualified (UQ) workers in the fields of EE and RES	A1: Meeting with the relevant manufacturers and contractors in order to define the necessary skills A2: Meeting of the relevant stakeholders (from industry, schools and the VET Agency) A3: Defining the learning outcomes of the various skills and occupations A4: Developing the curriculum for the training and education of the existing unqualified workers A5: Conducting a pilot project for training of existing unqualified workers	CROSKILLS Consortium	Funding for the development of the curriculum; Human resources; Funding for the practical education; Funding for printing the handbook (through project Build Up Skills Pillar II)	-	2014-2015 (in the course of the implementation of Build Up Skills Pillar II)
GM-4	Commencing an info campaign at the national level with the purpose of promoting EE refurbishment of buildings and the offer of licensed workers and certified companies in the realm of EE	A1: Establishing of the team and the WEB page (with all information on the licensed craftsmen) A2: Establishing of the team for contacts with equipment manufacturers to create a joint appearance on the market, all in favour of the manufacturers' support to the campaign aimed at employing certified workers while performing work related to EE and RES A3: Establishing of the team for contacts with the public administration institutions and the local governments for the purpose of the campaign encouraging the use of EE and RES in the construction of new buildings and refurbishing the old ones; The suggested name of the campaign is "Smart Place"	CROSKILLS Consortium	Funds intended for lobbying; Funds needed for WEB page (Financing through the Environmental Protection and Energy Efficiency Fund)	-	3 months after the start of Build Up Skills Pillar II)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PRE-REQUISITES FOR PLEMETATION	DEADLINE/ TIME- SPAN
GM-5	Retraining and lifelong education as to EE and RES for both unemployed and employed construction workers	<p>A1: Meeting with the relevant manufacturers and contractors in order to define the necessary skills</p> <p>A2: Meeting of the relevant stakeholders (from industry, schools and the VET Agency)</p> <p>A3: Defining the learning outcomes of the various skills and occupations</p> <p>A4: Making the curricula for the retraining of the employed and the unemployed workers</p> <p>A5: Conducting a pilot project for retraining of the employed and the unemployed workers</p>	CROSKILLS Consortium	<p>Funding for the development of the curriculum; Human resources; Funding for the practical education; Funding for printing the handbook</p> <p>(through project Build Up Skills Pillar II)</p>	-	2014-2015 (in the course of the implementation of Build Up Skills Pillar II)
GM-6	Development of the CROSKILLS marketing plan for the purpose of a lifelong education for workers	<p>A1: Establishing the marketing team</p> <p>A2: Finding the source of funding</p> <p>A3: Making the marketing plan (4 marketing plans – for users, investors, craftsmen and students)</p> <p>A4: Designing the promo materials</p> <p>A5: Campaign Launch (additional promotion by the Employers' Association, the Croatian Employment Service ...)</p>	CROSKILLS Consortium and the MCPP	<p>Human resources; The financial resources required for design, printing and distribution of promotional materials (funding through the Environmental Protection and Energy Efficiency Fund)</p>	Licensed workers and certified companies in the field of EE and RES	The end date of the project Build Up Skills Pillar II)
GM-7	Establishing the administrative structure	<p>A1: Defining conditions and criteria for the Training Program Performers</p> <p>A2: Defining the conditions and criteria of granting, renewing, validity, revocation and modifying the certification for construction workers in the area of EE and RES</p> <p>A3: Establishing a structure that would implement supervision over the implementation of the works in accordance with the knowledge and skills gained on a training and guarantees certification</p> <p>A4: Establishing and keeping the Registry of Certified Workers</p>	The Registry Keeper with the institutions and counselling support of the Ministry of Construction and Physical Planning	<p>The existing resources;</p> <p>The financial cost of establishing and keeping of the Registry of certified workers in the field of EE and RES (through project Build Up Skills Pillar II)</p>	-	Simultaneously with the start date of the project CROSKILLS Build Up Skills Pillar II

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR PLEMETATION	DEADLINE/ TIME- SPAN
GM-8	Informing the employers with the possibility of use of the Croatian Act on Subsidies	A1: Establishing the marketing team A2: Finding the source of funding A3: Making the marketing plan A4: Designing the promo materials A5: Campaign Launch (additional promotion by the Employers' Association, the Croatian Employment Service)	CROSKILLS Consortium and the MCPP	Human resources; The financial resources required for design, printing and distribution of promotional materials (funding through the Environmental Protection and Energy Efficiency Fund)	Licensed workers and certified companies in the field of EE and RES	The end date of the project Build Up Skills Pillar II)

LEGISLATIVE MEASURES (LM)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME- SPAN
LM-1	Public tenders system – green public tenders, the obligation of employing certified workers (after the sufficient number of educated workers have entered the market) and the mechanism for protection of local performers	A1: Education of those in government agencies and public enterprises who create and read public procurements A2: Interagency cooperation – a contact person in the Ministry of Finance that would work as a consultant for the creation of green public procurement A3: The introduction of the mandatory use of licensed workers in the public procurement procedures	The Ministry of Finance in cooperation with the Ministry of Construction and Physical Planning and other institutions	The Chief consultant for the creation of green public procurements (the contact person) The organization of training performed by the construction sector specialists ¹	There should be enough educated workers in the market for the condition of the employment of certified workers to become mandatory	The end of 2015 (related to Build Up Skills Pillar II)
LM-2	Certifying/licensing construction workers after they have completed education courses (licensing an individual)	A1: A system of the centralized knowledge evaluation A2: Certification (regardless of the training providers)	The Registry Keeper with the institutions and counselling support of the MCPP	The existing resources, from education funds	The existence of education, curricula and education institutions	The end of 2015 (related to Build Up Skills Pillar II)
LM-3	Monitoring the bodies responsible for training (depriving them of authorization)	A1: Making the plan of a life-long education of construction workers performing works in the construction of nearly-zero energy buildings and in refurbishing of the existing buildings for the purpose of EE A2: Defining the necessary equipment and resources for the implementation of training programs	VET Agency	The existing resources	Definition of "Supervision Report" and co-operation with professional associations to ensure the quality of implementation of the training program; defining the need for surveillance every 3 years	The end of 2015 (related to Build Up Skills Pillar II)

¹ The organization of training in the ways of including licensed workers in the green public procurement

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME- SPAN
LM-4	Monitoring the licensed companies and trades (depriving them of the license/ charging fines)	A1: Make the supervision and the related regulation stricter	the Ministry of Construction and Physical Planning	The existing resources	-	The end of 2016. (related to Build Up Skills Pillar II)
LM-5	Licensing of the companies and trades in the way that includes education obligation and the expiry of the certificate; evidence/registry of companies and trades licensed to perform EE and RES works	A1: A system of the centralized technical ability assessment and licensing	The Registry Keeper with the institutions and counselling support of the MCPP	The existing human resources; Companies bear the financial cost of licensing	The existence of licensed workers -The existence of education, curricula and education institutions	2016

TECHNICAL MEASURES (TM)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME- SPAN
TM-1	Development of the plan for a lifelong education for workers that are to construct nearly zero-energy buildings and refurbish the existing ones in terms of EE	<p>A1: Meeting with the relevant manufacturers and contractors in order to define the necessary skills</p> <p>A2: Meeting with the VET Agency , VET schools and faculties)</p> <p>A3: Defining the learning outcomes of the various skills and occupations</p> <p>A4: Analyzing the existing programs of training and further education</p> <p>A5: Surveying the existing practical education premises (workshops, schools, building sites)</p> <p>A6: Developing the methodology of attending theoretical and practical education contents (Plan)</p> <p>A7: Developing the conditions for which education performers are to comply with</p>	CROSKILLS Consortium	Human resources; Funds for making the plan through the project Build Up Skills Pillar II	Learning outcomes	6 months (from the start date of the project Build Up Skills Pillar II)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUI- SITES FOR IMPLEMENTA- TION	DEADLINE/ TIME- SPAN
TM-2	Training of experts who will train construction workers (Training of trainers)	A1: Meeting of the relevant stakeholders (from industry, schools and the VET Agency) A2: Envisaging the content of the training of trainers (handbook) A3: Planning of the performance of training by sectors A4: Performing the training (at 10 locations)	CROSKILLS Consortium External contributors	Human resources The equipment for practical education The cost of printing the handbook (through the project Build Up Skills Pillar II)		8 months (from the start date of the project Build Up Skills Pillar II)
TM-3	Establishing the Registry of Educated Workers that is to be accessible to a wider public; updating the Registry, taking evidence on life-long education	A1: Creating the database of certified workers A2: The methodology of the database content feed, i.e. the relevant data on the educated workers A4: Data on workshop having been held	CROSKILLS Consortium, The MCPP, institutional support Keeping the Registry through a stable professional association	Human resources External expert for creating the database Financing through the revenue from licensing (through the project Build Up Skills Pillar II)	Workers educated in EE and RES	10 months (from the start date of the project Build Up Skills Pillar II)
TM-4	Including the construction products manufacturers into the process of educating construction workers	A1: Analysis of the products available on the market by type of work A2 Making a list of producers by type of work groups A3 Analysis of existing training programs by manufacturers A4: Making a list of potential lecturers by manufacturers	CROSKILLS Consortium and the representatives of manufacturers,	Human resources (through the project Build Up Skills Pillar II)	The existing education materials and experience	6 months (from the start date of the project Build Up Skills Pillar II)
TM-5	Allocating financing sources and a systematization of the financial structure for educating labour force for the purpose of attaining the national EE objectives	A1: Contacting the potential financing institutions A2: The list of financiers A3: Devising projects and applying on calls for proposals (for ESF, as example) A4: Devising various models of financing for various users, i.e. programs (various possible financing ratios by users, sponsors, employer etc)	CROSKILLS Consortium	Human resources (through the project Build Up Skills Pillar II)	-	15-18 months (from the start date of the project Build Up Skills Pillar II)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME- SPAN
TM-6	Upgrading the process of practical work/practical segments of educational courses performed at the manufacturers' plants, building site or school workshops	A1: Surveying of the present state of the educational institutions A2: List of equipment for practical training for the respective types of work A3 Bringing the existing equipment at workshops up to date	CROSKILLS Consortium	Human resources (through the project Build Up Skills Pillar II)	-	15-18 months (from the start date of the project Build Up Skills Pillar II)
TM-7	A continuous monitoring of needs for qualified labour force, special skills and vocations needed for fulfilling the EE plan	A1: Gathering data on the needs of new skills in specific groups and vocations A2: The exchange of information about new needs and skills with the competent educators and instructions for creating new educational programs	CROSKILLS Consortium, The MCPP, institutional support The Registry Keeper	The existing Registry Keeper	-	After the education system for workers has been established

OTHER MEASURES (OM)

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PREREQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME- SPAN
OM-1	Revision and implementation of secondary school curricula for the vocations related to construction and refurbishment in terms of EE and RES	A1: In addition to the Technician for EE Construction curriculum, other VET curricula are to be developed at the local school levels and the curricula are in turn to contain EE and RES content with a compulsory practical training scheme in each of the curricula. Building at the local school level to develop vocational curricula with EE/RES content, with compulsory practical training in all curricula. Devising sample curricula models that can be transferred to other schools. A2: Introduction of an optional subject with similar content (possibilities to be analysed) into all VET schools A3: Providing for the practical education at schools or construction companies (see TM-6)	- School of Building and Crafts Čakovec - VET Secondary school Bedekovčina - Split (School of Design and Sustainable Construction) - Craftsmen and Industry School and School of Building, Zagreb and other schools of the kind VET Agency and the MCPP Schools	The existing personnel – teachers at the contributing schools The existing personnel Equipped workshops at schools or construction companies	Goodwill and agreement Accepting and recognizing by institutions (contributors) Companies that are interested	Until the January of 2015 Updating of curricula to take place each 5 years after that August 31, 2014 Same as A1

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PRE-REQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME-SPAN
		A4: The transfer of the developed programs and methods to other vocational schools	VET Agency in cooperation with model schools	Presenting the curricula at the annual school reviews	Authorization / verification of curricula by the Ministry of Science, Education and Sports	Depending on A1 and A3
OM-2	Legislation on EE performance quality control in the course of performance of works and prior to issuing operating licenses	A1: Lobbying and cooperation with the legislator in order for the quality control to be carried out in accordance with the relevant regulations	Croatian Association for Infrared Thermography	The existing personnel	Enforcing the laws	The end of 2013
OM-3	Encouraging the creation of curricula for interdisciplinary vocations	A1: Creation and verification of curricula applicable both in VET schools and in informal education	- - School of Building and Crafts Čakovec - VET Secondary school Bedekovčina - Split (School of Design and Sustainable Construction) - Craftsmen and Industry School and School of Building, Zagreb and other schools of the kind, VET Agency, the Ministry of Education, the Sectoral Council	The existing personnel	Accepting and recognizing by institutions (contributors)	2014-2020
		A2: Providing for the practical education accompanying this curriculum at schools or construction companies (see TM-6)	Schools	Equipped workshops at schools or construction companies	Companies that are interested; universities, various organizations that are not financed from the State Budget	2014-2020
OM-4	Encouraging the clustering of expert business entities taking part in the construction processes and establishing professional associations (by the expert community)	A1: Promotional activities that will encourage the clustering of professional business entities involved in the process of building A2: Promotional activities that will encourage professional associations established by the expert community	Croatian Chamber of Crafts and Trades (CCCT), Croatian Chamber of Commerce (CCC) Croatian Chamber of Crafts and Trades (CCCT), Croatian Chamber of Commerce (CCC)	Financial resources for promotional activities Financial resources for promotional activities	Accepting the office by its holder	At once Continuously At once Continuously

MEASURE MARK	MEASURE	ACTIVITIES (STEPS FOR IMPLEMENTATION)	CONTRIBUTOR	RESOURCES (material, human, financial)	(Possible) ADDITIONAL PRE-REQUISITES FOR IMPLEMENTATION	DEADLINE/ TIME-SPAN
OM-5	Taking part in the process (workgroup) for changing the legislative in the realm of dwelling and dwellers' proprietorship relations	A1: Taking part in the process (workgroup) for changing the legislative in the realm of dwelling and dwellers' proprietorship relations	Coordination of the Association of dwellers of Croatia, CCCT, Residential Buildings Management Council (at CCC, the Construction Sector)	Financial resources for the operative work	Passing legislative acts in the envisaged period of time	Until the end of 2013?
OM-6	Promoting the urban refurbishment (so-called placemaking, creating a pleasant place for living)	A1: Creating a program of urban renewal at the state level	MCCP, the Town of Rijeka as a model example	Human capacities		Early in 2014 (depending on the dynamics of accepting the operative financial plans 2014-2020)
		A2: Creating a program of urban renewal of model example towns (Rijeka, Koprivnica ...)	The Town of Rijeka, The Town of Koprivnica ...	Human capacities		Early in 2014
		A3: Development of projects for EU funding (e.g. ERDF, Smart Cities, etc.)	Towns, municipalities (Local self-government units)	Human capacities within the contributors; Funds for employment of external experts		From 2014 onwards
OM-7	State-level subsidies for EE refurbishment of buildings	A1: Overview of the current situation and the available subsidies with the suggestion as to possible new subsidies on the model of other EU member states	Ministry of Finance MCCP, Environmental Protection and EE Fund	Funds for employment of external counsellors		To commence immediately

7. Monitoring

Monitoring of implementation of established measures is planned to be done as a part of work package of second part of the project BUILD UP SKILLS Pillar II.

8. Endorsement documents

As one of the main goals of the project CROSKILLS is acceptance of National roadmap for a lifelong education of construction workers in the field of energy efficiency from relevant ministries and other stakeholders which have to ensure market evaluation of construction workers and have to contribute in the achievement of national targets in the field of energy efficiency.

[Date of Endorsement Letter]

To: Ivana Banjad Pečur
Project CROSKILLS coordinator
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Subject: Endorsement for “National Roadmap for continuous education of civil workers in energy efficiency”

In my capacity as (Position and Organization), I herewith declare our identification with proposed measures in “National Roadmap for continuous education of civil workers in energy efficiency” which was developed within the project CROSKILLS funded by EC under program Intelligent Energy Europe.

We consider these proposed measures suitable for enhancing the skills of building workers and ensuring that sufficient numbers of skilled workers are available to achieve the energy and climate policy targets in the building sector. We will contribute to the best of our ability to implementing the measures proposed in the National Roadmap.

We would like to participate in the following of the proposed activities:

-

-

Sincerely,

XY
ADDRESS
NAME OF ORGANIZATION

On the Figure 6 it can be found Endorsement letter that has been given to the relevant stakeholders.

Figure 6 Draft of the Endorsement letter for the National roadmap for a lifelong education of construction workers in the field of energy efficiency

Table 10 shows ministries, institutions, associations and schools that gave Endorsement letter for the National roadmap for a lifelong education of construction workers in the field of energy efficiency. Endorsement letter for the National roadmap are given in the **Chapter 13. Endorsement letter for the National roadmap for a lifelong education of construction workers in the field of energy efficiency**

Table 10 List of institutions that gave Endorsement letter for the National roadmap

NAME OF INSTITUTION	SIGNATORY OF THE ENDORSEMENT LETTER
Ministry of Construction and Physical Planning	Anka Mrak Taritaš, Minister
Ministry of Environment and Nature Protection	Mihael Zmajlović, Ministrer
Ministry of Labour and Pension System	Mirando Mrsić, Minister
Ministry of Economy	Jelena Zrinski Berger, Asistant Minister
Ministry of Entrepreneurship and Crafts	Vjekoslav Rakamarić, Asistant Minister
Ministry of Science, Education and Sports	Sabina Glasovac, Asistant Minister
Environmental Protection and Energy Efficiency Fund	Sven Muller, acting Director
Agency for Vocational Education and Adult Learning	Ivan Šutalo, Headmaster
Croatian Employment Institute	Ankica Paun Jarallah, Director
City of Zagreb	Marijan Maras, Head of City office for Energetic, Nature Protection and Sustainable development
City of Koprivnica	Vesna Željeznjak, Mayer
Croatian Chamber of Economy—Sector for Construction and Communal Economy	Vedran Vilović, Direcor of Sector
Croatian Chamber of Civil Engineer	Zvonimir Sever, President
Croatia Green Building Council	Snježana Turalija, Executive Diretor
Croatian Association of Court Expert Witnesses	Melita Bestvina, President
Croatian employers` Association	Davor Majetić, General Manager
Croatian Association of Facade Thermal Insulation Systems	Dorijan Rajković, President
Croatian Society for Infrared Thermography	Krešimir Petrović, President
Building Managers association	Tomislav Štimac, President
Tenant Association and Coordination	Milan Jokić, Secretary
Croatian Association of Roofers	Vladimir Makoter, President
Construction and Technical School Rijeka	Boris Petrović, Headmaster
Vocational School Vice Vlatković Zadar	Tihomir Tomčić, Headmaster

9. Conclusion

The Build Up Skills incentive was started within the CIP Intelligent Energy Europe (IEE) program that is to contribute to attaining the EU objectives until the year of 2020, namely a reduction of the greenhouse gases by 20 %, a reduction of energy consumption by 20 % and the 20 % share of RES in the energy sources.

The BUILD UP Skills incentive consists of two parts:

1. Establishing the National Qualification Platform and devising the Roadmap for attaining the 20-20-20 objectives
2. Devising the qualification scheme and the lifelong education of construction workers scheme

Based on a comprehensive analysis of the national situation (National Status Quo Analysis, February 2013), the Roadmap was made for a lifelong education of construction workers in the field of energy efficiency

The Roadmap takes into account the expected contribution of the construction sector to the national objectives 2020, and to the requirements of nearly-zero energy buildings through the strategic planning of education and training of construction workers in the area of EE and RES and through the market assessment of such labour force, which can improve the long-term energy performance of buildings in the Republic of Croatia.

The Roadmap is oriented to the start of the education of the existing labour force for some vocations (plasterer, bricklayer, carpenter, painter, roofer, dry-liner, the installers of biomass burning devices, heat pumps, shallow geothermal systems and solar panels) as well as of the training and retraining of existing and unemployed workers into the needed vocations. Within the CROSKILLS project, the National Qualification Platform was established and it includes all the relevant stakeholders in the sectors of construction and education (the representatives of craftsmen, industrial associations, educational and professional associations and the relevant public bodies).

The Roadmap includes:

- the 20-20-20 objectives: energy savings and a share of RES in the construction sector,
- the identification of the qualification needs and lacks in the construction sector, i.e. the determining of the number of workers to be educated/trained in each of the sub-sectors (roofers, workers performing refurbishing works or works on the building envelopes, carpenters, solar panels, photovoltaic arrays, biomass burning devices and wind energy devices installers).
- the identification of the priority measures in accordance with the needs of various sectors (new qualification schemes and/or updating the existing ones) and in relation with various vocations for the purpose of attaining the set objectives.
- the defining of the action plan for the identified measures to be implemented by the year of 2020, the steps for implementing the measures, additional resources, the contributors that are to perform the implementation, financial resources for the implementation, necessary accompanying measures and the monitoring of the progress of the proposed activities.

The roadmap explains how to overcome the identified shortcomings in various sectors for the purpose of attaining the 20-20-20 objectives in the construction sector.

As a result, the Roadmap has been accepted by the relevant bodies and stakeholders that have undertaken to follow and implement it.

10. Authors and Contributors

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- Professor Nina Štirmer, PhD, Bojan Milovanović, PhD and Ivana Carević
- Professor Igor Balen, PhD and Professor. Davor Škrlec, PhD (in-house consultants)

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- Sandra Vlašić, Robert Pašičko and Grga Mirjanić

11. References

- [1] Republic of Croatia Ministry of Economy: Annual Energy Report, Energy in Croatia 2010, Godišnji energetski pregled, 2012
- [2] Solar thermal and concentrated solar power barometer, EurObserv`ER, 2013
- [3] Toplinsko iskorištavanje biomase i snčeve energije, Matko Perović, dipl.ing.stroj., BioSolESCO Project - Expanding biomass and solar heating in public and private buildings via the energy services approach (EIE-07-264) project, Energy Institute Hrvoje Požar
- [4] United Nations Development Programme Croatia: Analysis of the number of green jobs in the sector of energetics in Croatia, 2010 (in Croatian)
- [5] Republic of Croatia, Ministry of Construction and Physical Planning: Strategy of Energetic development of the Republic of Croatia (Official Gazette 130/2009), (in Croatian)
- [6] Republic of Croatia, Ministry of economy, work and entrepreneurship: National programme of energy efficiency 2008-2016, (in Croatian)
- [7] Republic of Croatia, Ministry of economy, work and entrepreneurship: The first national action plan for energy efficiency 2008. - 2010., (in Croatian)
- [8] Republic of Croatia, Ministry of economy and Ministry of construction and physical planning: The second national action plan for energy efficiency for the period to the end of 2013, 2013 (in Croatian)
- [9] United Nations Development Programme Croatia, Ministry of Environmental Protection, Construction and Physical Planning, Croatian Bank for Reconstruction and Development, Environmental protection and energy efficiency Fund,: Programme of energy refurbishment of public buildings 2012. – 2013 (in Croatian)
- [10] United Nations Development Programme Croatia, Ministry of Environmental Protection, Construction and Physical Planning: Project Supporting Croatia's transition to low-emission development (LEDS) (in Croatian)
- [11] The Act on Croatian Qualifications Framework (Official Gazette 22/2013) (in Croatian)
- [12] Build Up Skills CROATIA – CROSKILLS: Status quo analysis of the building sector in Croatia and skills of construction workers in the field of energy efficiency and renewable sources of energy, February 2013
- [13] Republic of Croatia, Ministry of Construction and Physical Planning: Ordinance on Conditions and Parameters of Recognizing System of Services and Performance Quality for the purpose of certifying the authorised RES/photovoltaic systems installers, (Official Gazette 79/2013). (in Croatian)
- [14] IPA Komponenta IV – Razvoj ljudskih potencijala, Program Europske unije za Hrvatsku; Implementacija novih kurikuluma; EuropeAid/127473/D/SER/HR, EPRD konzorcij u suradnji s European Profiles SA, University of Jyväskylä, Chronos Info i Agencija za strukovno obrazovanje i obrazovanje odraslih, travanj 2010 – listopad 2011 godine (in Croatian)
- [15] 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 amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (in Croatian)
- [16] Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC [OJ L315 p.1] (in Croatian)
- [17] Republic of Croatia, Ministry of economy, work and entrepreneurship: The Act on the state subsidies for education and training (Official Gazette 109/07, 134/07, 152/08) (in Croatian)
- [18] Croatian Standards Institute, Croatian Accreditation Agency, Association of Croatian Cities, Portal of public procurement and United Nations Development Programme Croatia : Procura + Vodič za isplativu održivu javnu nabavu, (in Croatian), printed during the project PROCURA+ (coordinator: ICLEI Freiburg, Germany)
- [19] Republic of Croatia, Ministry of Construction and Physical Planning: The Act on architectural and engineering jobs and activities in the field of physical planning and construction process (Official Gazette 152/08, 124/09, 49/11, 25/13) (in Croatian)
- [20] Lieve Engelen (Employment, Social Affairs and Inclusion DG, Unit C.1), Robert Plasman, DULBEA— Université de Bruxelles (University of Brussels), Brussels; at others, European Commission, Directorate-General for Employment, Social Affairs and Inclusion: Promoting green jobs throughout the crisis: a handbook of best practices in Europe, European Employment Observatory Review
- [21] HRN EN 13829:2002 Thermal performance of buildings -- Determination of air permeability of buildings -- Fan pressurization method (ISO 9972:1996, modified; EN 13829:2000)
- [22] Republic of Croatia, Ministry of Justice: The act on the ownership and other property rights - Official Gazette 91/96, 68/98, 137/99, 22/00, 73/00, 129/00, 114/01, 79/06, 141/06, 146/08 (in Croatian)

12. Glossary

NQP	National Qualification Platform
ERDF	European Regional Development Fund
EEEF	European Energy Efficiency Fund
JESSICA	Joint European Support for Sustainable Investment in City Areas
SWOT analysis	Strengths, Weaknesses, Opportunities, and Threats
ESCO	Energy Service Company
EU	European Union
EQF	European Qualifications Framework
CROQF	Croatian Qualifications Framework
QF-EHEA	Qualifications Framework for the European Higher Education Area
EPBD	Energy Performance of Buildings Directive
EED	Directive 2012/27/EU on energy efficiency
ASOO	Agency for Vocational Education and Training and Adult Education (VET Agency)
ESF	European Social Fund
ICT	Informatic association
EEO	The European Employment Observatory
EES	the European Employment Strategy
JLSU	Local government
IEE	Intelligent Energy Europe
ASOO	Agency for Vocational Education and Training and Adult Education (VET Agency)
EE	energy efficiency
RES	renewable energy sources
MZOS	Ministry of Science, Education and Sports
HZZ	Croatian Employment Service
FINA	Financial Agency
JMO	Integrated educational model
HOK	Croatian Chamber of Trades and Crafts
ZUKE	Law on energy efficiency
EPBD	Energy Performance of Buildings Directive
RH	Republic of Croatia
IEE	Intelligent Energy Europe
UNDP	United Nations Development Programme
GVD	gross value added
GDP	gross domestic product
DZS	Croatian Bureau of Statistics
STS	solar heating systems
EIHP	Energy Institute Hrvoje Požar
ESTIF	European Solar Thermal Industry Federation
PV systems	photovoltaic systems
HROTE	Croatian Energy Market Operator

13. Appendix

13.1. Endorsement letter for the National roadmap for a lifelong education of construction workers in the field of energy efficiency



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REPUBLIKA HRVATSKA
 SVEUČILIŠTE U ZAGREBU
 GRAĐEVINSKI FAKULTET

Primljeno: 21.11.2013.		
Klasifikacijska oznaka	Org. jed.	
131-04/13-05/01	04-06	
Urudžbeni broj	Pril.	Vrij.
531-13-5		

Klasa: 360-01/12-01/36
 Ur. broj: 531-01-13-33
 Zagreb, 15. studenog 2013.

Sveučilište u Zagrebu
 Građevinski fakultet
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 Zavod za materijale
 10000 Zagreb
 Fra Andrije Kačića-Miošića 26

Predmet: Potpora Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti
 - pismo potpore, daje se

Poštovani,

Zahvaljujemo na dostavi dokumenta Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti, izrađenih u okviru projekta Build-Up Skills Croatia – CROSKILLS, Inteligentna energija u Europi (IEE), čiju je izradu za Hrvatsku koordinirao Građevinski fakultet Sveučilišta u Zagrebu.

Dokument je raspravljen na sastanku održanom 30. listopada 2013. u ovom Ministarstvu, a u raspravi su sudjelovali predstavnici nadležnih ministarstava, agencija i stručnih institucija zainteresiranih za izobrazbu građevinskih radnika u energetske učinkovitosti.

Predložene smjernice predstavljaju kvalitetnu stručnu podlogu za daljnji rad institucija i zainteresiranih strana na zakonodavnom i institucionalnom uređenju u cilju unapređenja izobrazbe građevinskih radnika u energetske učinkovitosti.

Ministarstvo graditeljstva i prostornoga uređenja spremno je u okviru svoje nadležnosti i nadalje pružati potporu projektu CROSKILLS, uključujući provedbu sljedeće faze projekta.

S poštovanjem,



Mr. sc. Irena Parizet dipl. ing. arh.

Prilog:
 - Pismo potpore - engleska verzija

Dostaviti:

1. Građevinski fakultet, prof. dr. sc. Ivana Banjad Pečur, Ul. Kačića-Miošića 26, Zagreb
2. U spis predmeta



REPUBLIKA HRVATSKA
MINISTARSTVO GOSPODARSTVA
 UPRAVA ZA ENERGETIKU I RUDARSTVO

Klasa: 310-02/13-01/195
 Ur.broj: 526-03-02-02-02/1-13-3

Zagreb, 6. studenog 2013.

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 Koordinator projekta Croskills

Predmet: Podrška „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

Poštovani

U mojoj funkciji kao pomoćnica ministra u Ministarstvu gospodarstva, Uprava za energetiku i rudarstvo, ovime potvrđujem našu podršku predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta BuildupSkills – CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. U okviru našeg djelokruga rada pridonijeti ćemo u implementaciji mjera predloženih u Nacionalnim smjernicama.

Spremni smo sudjelovati u aktivnostima:

1. Jačanja nacionalne svijesti o potrebi stalnog educiranja i licenciranja građevinskih radnika za vrijeme i nakon završene temeljne izobrazbe,
2. Savjetovanja u izradi nacionalnih programa i procesa jačanja stručnog obrazovanja relevantnih za energetske učinkovitost i obnovljive izvore energije,
3. Stvaranja zakonskih okvira za provođenje mjera obrazovanja, certifikacije i provjere znanja radne snage u graditeljstvu sa ciljem promicanja energetske učinkovitosti,
4. Promocije poticanja energetske učinkovitosti u gospodarskim aktivnostima u Republici Hrvatskoj,
5. Poticati i odrediti zakonske okvire za sustav javne nabave (zelena javna nabava) korištenjem licenciranih materijala i izvođača radova.
6. Određivanja nacionalnih ciljeva i interesa u programima strukovne izobrazbe građevinskih radnika u Republici Hrvatskoj,
7. Koordinacije nadzora nad radom certificiranih radnika, tvrtki i certifikacijskih institucija za provođenje zadataka u području energetske učinkovitosti u graditeljstvu
8. Stvaranja programa poticajnih mjera za uspostavu trajnog sustava izgradnje energetske učinkovitosti u ukupnom gospodarstvu Republike Hrvatske.
9. Poticati promjenu svih oblika nacionalne regulative u cilju podizanja razine primijenjene energetske učinkovitosti u svim segmentima gospodarstva zemlje

S poštovanjem





REPUBLIKA HRVATSKA
MINISTARSTVO PODUZETNIŠTVA I OBRTA

Zagreb, 21. studeni 2013.

Prima: Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

U mojoj funkciji kao (pomoćnik ministra poduzetništva i obrta), ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- Edukacija i kontinuirano cjeloživotno učenje postojećih kvalificiranih radnika (KV) u EnU i OIE
- Osposobljavanje i kontinuirano cjeloživotno učenje postojećih nekvalificiranih radnika (NKV) u EnU i OIE
- Prekvalificiranje za EnU kontinuirano cjeloživotno obrazovanje zaposlenih i nezaposlenih radnika
- Upoznavanje poslodavaca s mogućnošću korištenja Zakona o državnoj potpori za obrazovanje i izobrazbu
- Unaprjeđivanje provedbe praktičnog dijela nastave u tvrtkama proizvođačima, na gradilištu ili u školskim radionicama
- Revidirati i implementirati kurikulume u srednjim školama za zanimanja koja su vezana za obnovu i gradnju u okviru EnU i OIE
- Poticanje izrade kurikuluma za interdisciplinarna zanimanja.

S poštovanjem,

Vjekoslav Rakamarić
Ulica grada Vukovara 78, 10000 Zagreb
Ministarstvo poduzetništva i obrta





REPUBLIKA HRVATSKA
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KLASA: 910-08/13-01/00430
 URBROJ: 533-25-13-0004
 Zagreb, 8. studenoga 2013.

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Predmet: Podrška „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

U mojoj funkciji kao Pomoćnice ministra Ministarstva znanosti, obrazovanja i sporta, ovime potvrđujem našu podršku predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta Build up Skills – CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. U okviru našeg djelokruga rada pridonijet ćemo u implementaciji mjera predloženih u Nacionalnim smjernicama.

Spremni smo sudjelovati u sljedećim aktivnostima:

- partnerstvu s dionicima izraditi i donijeti strukovne kurikulume koji su usklađeni s potrebama polaznika, tržišta rada i društva u cjelini;
- uvođenju novih izbornih predmeta i nastavnih sadržaja;
- ulaganju i razvijanju programa stručnog usavršavanja odgojno-obrazovnih djelatnika;
- provođenju kampanje i drugih aktivnosti u svrhu promocije obrazovanja odraslih.

S poštovanjem,


 POMOĆNICA MINISTRA
Sabina Glasovac
 Sabina Glasovac, prof.





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**FOND ZA ZAŠTITU OKOLIŠA
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Klasa: 310-01/13-01/06
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Zagreb, 07. studenog 2013.

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Kordinator projekta Croskills

PISMO PODRŠKE

Predmet: Podrška „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

Poštovani,

Fond za zaštitu okoliša i energetske učinkovitost je pravna osoba s javnim ovlastima, a osnivačka prava i dužnosti u ime Republike Hrvatske obavlja Vlada Republike Hrvatske. Fond je osnovan radi financiranja programa, projekata i drugih aktivnosti u području zaštite okoliša, energetske učinkovitosti i korištenja obnovljivih izvora energije, te obavlja djelatnost u području poticanja racionalnog gospodarenja energijom i energetske učinkovitosti u neposrednoj potrošnji u Republici Hrvatskoj. Fond je ovlašten za provedbu politike i mjera energetske učinkovitosti, koju ostvaruje i putem poticanja i suradnje sa domaćim znanstvenim i stručnim institucijama, kao i s međunarodnim institucijama radi postizanja ciljeva Strategije energetskog razvoja Republike Hrvatske i preuzetih obveza smanjenja emisija CO₂ za 20%, povećanja proizvodnje energije iz obnovljivih izvora za 20% i smanjenja ukupne potrošnje primarne energije za 20% povećanjem energetske učinkovitosti do 2020. godine.

Fond za zaštitu okoliša i energetske učinkovitost izražava podršku predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta Build up Skills – CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatraju se prikladnima za poboljšanje vještina građevinskih radnika radi osiguranja dovoljnog broja kvalificiranih stručnjaka što je značajno za postizanje ciljeva politike energetske učinkovitosti i zaštite okoliša u građevinskom sektoru.

Fond u okviru djelokruga rada podržava implementaciju mjera predloženih u Nacionalnim smjernicama i može sudjelovati u aktivnosti OSM-7 Poticaji na državnoj razini za energetske obnovu zgrada u skladu s Programom rada Fonda.

S poštovanjem,



v.d. DIREKTOR

Sven Müller, dipl.ing.grad.



HRVATSKI ZAVOD ZA ZAPOSŁJAVANJE SREDIŠNJI URED

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KLASA: 103-02/13-01/22
UR. BROJ: 344-10/1-13-22
Zagreb, 7. studenoga 2013. godine

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Kordinator projekta Croskills

Predmet: Podrška „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

Kao ravnateljica Hrvatskoga zavoda za zapošljavanje, potvrđujem našu podršku predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta *Build up Skills – CROSKILLS*, financiranog od strane Europske komisije u sklopu programa *Intelligentna strategija* u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te osiguravanje dovoljnog broja kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskej sektoru. U okviru našeg djelokruga rada pridonijet ćemo primjeni mjera predloženih u Nacionalnim smjernicama.

Spremni smo sudjelovati u sljedećim aktivnostima:

- Analiza i praćenje potreba za kvalificiranom radnom snagom na tržištu rada, potrebnih kompetencija za provođenje plana energetske učinkovitosti; doprinos pri izradi standarda zanimanja koji će činiti temelj za izradu standarda kvalifikacija i novih strukovnih kurikuluma.
- Analiza baze podataka o potencijalnoj radnoj snazi i kompetencija nezaposlenih radnika (regionalno) u cilju dodatnih osposobljavanja i edukacija (certificiranje).
- Provođenja mjera aktivne politike zapošljavanja koje potiču zapošljivost i mobilnost radne snage.
- Promocija i popularizacija deficitarnih obrtničkih zanimanja u graditeljstvu, posebice u području energetske učinkovitosti.
- Podrške sustavnom provođenju cjeloživotnog učenja kroz mjere sufinanciranja obrazovanja i stručnog usavršavanja.
- Prihvatanje postupka zelene javne nabave.

S poštovanjem,

REPUBLIKA HRVATSKA
SVEUČILIŠTE U ZAGREBU
GRAĐEVINSKI FAKULTET



RAVNATELJICA
Ankica Paun Jarallah



Primljeno: 11-11-2013		
Klasifikacijska oznaka	Broj izvješća	
131-04/13-05/01	15	
Uredbeni broj	Prih.	Vrij.
344-13-4		



REPUBLIKA HRVATSKA
GRAD ZAGREB
Gradski ured za energetiku, zaštitu
okoliša i održivi razvoj

Ivana Banjad Pečur
Koordinator projekta CROSKILLS
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

Poštovana gospođo Banjad Pečur,

U mojoj funkciji pročelnika Gradskog ureda za energetiku, zaštitu okoliša i održivi razvoj, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati i podržati implementaciju sljedećih aktivnosti:

- Kampanju vezanu uz primjenu mjera energetske učinkovitosti i obnovljivih izvora energije u gradnji novih zgrada i obnovi postojećih zgrada;
- Obrazovanje osoba koje izrađuju natječajnu dokumentaciju javne nabave i evaluiraju ponude u državnim ustanovama i javnim poduzećima nakon što će na tržištu biti dovoljno educiranih radnika;
- Relevantni sastanci dionika;
- Istražiti mogućnosti zajedničke kolaboracije s projektima slične tematike koje provodi Grad Zagreb.

S poštovanjem,

PROČELNIK
Marijan Maras, dipl.ing.



KLASA: 351-01/13-01/0017
URBROJ: 2137/01-03/1-13-3
Koprivnica, 14. studenog 2013.

Sveučilište u Zagrebu
Građevinski fakultet
Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Fra Andrije Kačića Miošića 26
10000 Zagreb

PREDMET: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

Poštovani,

kao gradonačelnica Grada Koprivnice, ovime potvrđujem našu suglasnost i s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Grad Koprivnica jedan je od rijetkih hrvatskih gradova koji provodi politiku zelene gradnje. Dosad smo u projektu „Novo lice Koprivnice“ izgradili dvije stambene zgrade energetskeg razreda A+ s ukupno 56 stanova, Palaču pravde, zgradu javne namjene energetskeg razreda A te dječji vrtić energetskeg razreda B. Trenutno gradimo stambeno-poslovnu zgradu s 24 stana i uredskim prostorima energetskeg razreda A+ te rekonstruiramo zgradu za potrebe Medijskeg sveučilišta, energetskeg razreda A. Napominjem da će i svi budući objekti kojima je investitor Grad Koprivnica biti niskoenergetski.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. U skladu s našim mogućnostima, maksimalno ćemo pridonijeti implementaciji mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- Realizacija edukacije radnika putem potencijalnih programa Pučkog otvorenog učilišta kojem je Grad Koprivnica osnivač.

S poštovanjem,



HRVATSKA GOSPODARSKA KOMORA

Sektor za graditeljstvo i komunalno gospodarstvo

KLASA: 052-02/13-01/40
URBROJ: 311-09/2/2-13-01
Zagreb, 12. studenoga 2013.

Sveučilište u Zagrebu, Građevinski fakultet
n/r gđa. Ivana Banjad Pečur
Koordinator projekta CROSKILLS
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

PREDMET: Suglasnost s „Nacionalnim smjericama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

Poštovana gospođo Banjad Pečur,

u mojoj funkciji kao v.d. direktora Sektora za graditeljstvo i komunalno gospodarstvo HGK, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjericama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- Uključivanje tvrtki izvođača građevinskih radova u edukaciju građevinskih radnika održavanjem praktičnih seminara
- Poticanje udruživanja tvrtki izvođača građevinskih radova putem osnivanja i udruživanja u klustere čime bi se povećala konkurentnost
- Uključivanje u proces za promjenu regulative vezano uz stanovanje i stanogradnju kroz radne skupine

S poštovanjem,

Vedran Vilović, dipl.ing.građ.

Draškovićeva 45, Zagreb



ISO 9001:2008

Draškovićeva 45, HR-10000 ZAGREB, tel.: +385 (0)1 4606 707, 4619 250, fax: +385 (0)1 4606 734
 e mail: graditeljstvo@hgk.hr, www.hgk.hr



Agencija za
strukovno obrazovanje
i obrazovanje odraslih

KLASA: 023-03/13-06/1

URBROJ: 332-05-02/20-13-6

Zagreb, 11. studenoga 2013.

Građevinski fakultet
Sveučilište u Zagrebu,
Fra Andrije Kačića Miošića 26
10 000 Zagreb
Prof. dr. sc. Ivana Banjad Pečur
Koordinator projekta CROSKILLS

Predmet: Podrška „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

Agencija za strukovno obrazovanje i obrazovanje odraslih osigurat će podršku predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta Build up Skills - CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo ocjenjuju se prikladnima za poboljšanje vještina građevinskih radnika te za osiguravanje dovoljnog broja kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru.

Agencija iskazuje spremnost sudjelovati u sljedećim aktivnostima Projekta:

- usklađivanju obrazovnih programa s potrebama tržišta rada/gradilišta kako bi se postigli ciljevi energetske i klimatske politike u građevinskom sektoru
- izradi standarda zanimanja, standarda kvalifikacije i modernih kurikuluma, temeljenih na ishodima učenja - u obrazovanju odraslih i redovnom strukovnom obrazovanju, za zanimanja fasader, zidar, tesar, krovopokrivač, monter suhe gradnje, soboslikar/ličilac čime bi se napravila revizija postojećih obrazovnih programa i postigao fleksibilan/ modularan pristup
- stručnom usavršavanju nastavnika (trening trenera, trening nastavnika) u planiranom opsegu
- implementaciji novih obrazovnih programa u planiranom opsegu
- svim ostalim aktivnostima u okviru Nacionalnih smjernica koje doprinose razvoju Hrvatskog kvalifikacijskog okvira i osiguranju sustava kvalitete u strukovnom obrazovanju i obrazovanju odraslih

S poštovanjem,


 RAVNATELJ
 Zagreb
 Ivan Sutało, dipl. ing.

Dostaviti:

1. Naslovu
2. Pismohrani, ovdje

Radnička cesta 37b, 10 000 Zagreb, RH, T + 385 1 62 74 666, F + 385 1 62 74 606, ured@asoo.hr,
URL www.asoo.hr, MATIČNI BROJ 02650029, OIB 40719411729

STRUKOVNA ŠKOLA VICE VLATKOVIĆA

23000 Zadar, Nikole Tesle 9C

Tel.: 023/239-460, 239-461, 239-463, fax: 023/239-472

E-mail: ss-zadar-513@skole.t-com.hr

Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26
10000 Zagreb

n/p g-đa

Ivana Banjad Pečur
Kordinator projekta CROSKILLS

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

U mojoj funkciji kao ravnatelja Strukovne škole Vice Vlatkovića u Zadru, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- Izradi fleksibilnih i modularnih kurikuluma te provođenju edukacije

S poštovanjem,

Ravnatelj:


Tihomir Tomčić, dipl. ing.
Strukovna škola Vice Vlatkovića
Nikole Tesle 9C, 23000 Zadar

**BUILD UP SKILLS EUROPEAN INITIATIVE
BUILD UP CROATIA - CROSKILLS**

**Izjava
(Letter of Endorsement)**

Mi, GRAĐEVINSKA TEHNIČKA ŠKOLA-RIJEKA, ovim putem izjavljujemo kako se prepoznajemo u predloženim mjerama. Držimo ih pogodnim za poboljšanje vještina građevinskih radnika i osiguravanje dovoljnog broja kvalificiranih radnika na raspolaganju kako bi se ostvarili ciljevi energetske i klimatske politike u sektoru graditeljstva.

Sve ćemo svoje sposobnosti staviti u službu doprinosa provođenju mjera predviđenih Akcijskim planom.

Štoviše, željeli bismo biti uključeni u sljedeće mjere/aktivnosti:

- pružanjem prostornih i didaktičkih uvjeta za edukaciju građevinskih radnika
- sudjelovanjem vaših nastavnika u teoretske dijelu edukacije
- stručnim usavršavanjem vaših nastavnika za edukatore i trenere u provedbi edukacije

Mjesto i nadnevak ; Rijeka, 8. studeni 2013.

Potpis - Pečat


HUP 2013

Hrvatska udruga poslodavaca

Prima: **Ivana Banjad Pečur**
 Koordinator projekta CROSKILLS
 Sveučilište u Zagrebu, Građevinski fakultet
 Fra Andrije Kačića Miošića 26,
 10.000 Zagreb

U Zagrebu, 13.11.2013.
 HUP-ZG_0660-13/1

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

U mojoj funkciji, kao glavni direktor Hrvatske udruge poslodavaca, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno, u sklopu naših mogućnosti, implementaciji mjera predloženih u Nacionalnim smjernicama.

S poštovanjem,

Davor Majetić

glavni direktor
 Hrvatska udruga poslodavaca



HUP je član



Središnji ured: Ulica Pavla Hatza 10, 10000 Zagreb, tel: 01 48 57 333, fax: 01 48 57 336, e-mail: hup@hup.hr, www.hup.hr
 Broj računa: 23400097100151718, IBAN: HR98 2340 0097 1001 5171 8, matični broj: 6240928, OIB: 60978339235

Podružnica Osijek: Trg Ljudevita Gaja 6, 31000 Osijek, tel: 051 251 012, tel/fax: 051 251 013, e-mail: hup-osijek@hup.hr

Podružnica Rijeka: Dolac 8/II, 51000 Rijeka, tel: 051 321 494/495, fax: 051 321 499, e-mail: hup-rijeka@hup.hr

Podružnica Split: Bernardinova 1, 21000 Split, tel: 021 355 288/296, tel/fax: 021 355 212, e-mail: hup-split@hup.hr



7.11.2013.

Prima: Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

U mojoj funkciji kao predsjednika udruge HUPFAS, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- edukacija izvođača u segmentu izvođenja energetski efikasnih fasada
- edukacija ostalih 'stake-holdera' o svojstvima energetski efikasnih fasada

S poštovanjem,



La:
mr.sc. Dorijan Rajković
Vučak 34, Zagreb
HUPFAS



www.huk.hr

15. studenoga 2013.

Prima: Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

U mojoj funkciji kao predsjednik Hrvatske udruge krovopokrivača, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- OM-1, A1: Sastanak s relevantnim proizvođačima i izvođačima u svrhu definiranja potrebnih vještina
- A5: Provesti pilot projekt obuke postojećih kvalificiranih radnika

OM-3, A1: Sastanak s relevantnim proizvođačima i izvođačima u svrhu definiranja potrebnih vještina
A5: Provesti pilot projekt obuke osposobljavanja postojećih nekvalificiranih radnika

OM-5, A1: Sastanak s relevantnim proizvođačima i izvođačima u svrhu definiranja potrebnih vještina
A5: Provesti pilot projekt prekvalifikacije zaposlenih i nezaposlenih radnika

TM-1, A1: Sastanak s relevantnim proizvođačima i izvođačima u svrhu definiranja potrebnih vještina

TM-3, A1: Izrada baze podataka o licenciranim radnicima
A2: Metodologija ispunjavanja baze odnosno relevantni podaci o educiranim radnicima
A4: Podaci o održavanju seminara

S poštovanjem,



Vladimir Makoter ing. građ.
Bisačka 21, Zagreb
Hrvatska udruga krovopokrivača



N/p Ivana Banjad Pečur
Kordinator projekta CROSKILLS
A Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26
HR 10000 Zagreb
D Ponedjeljak, 8. studenog 2013.

PREDMET: Suglasnost Hrvatskog savjeta za zelenu gradnju (HSZG) s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

Predsjednik Hrvatskog savjeta za zelenu gradnju, Hrvoje Kvasnička, te izvršna direktorica HSZG-a, Snježana Turalija, potvrđuju u ime HSZG-a suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama, posebno u kontekstu proširenja znanja gore navedenih stručnjaka na područje tematike zelene gradnje.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- Edukaciji izvođača radova i voditelja gradilišta o više tema vezanih uz energetskej učinkovitost i gradnju održivih zgrada (kroz Green Building Professional edukaciju, Simpozije o zelenoj gradnji i ostalim edukacijama prema potrebi)

S poštovanjem,

Za Hrvatski savjet za zelenu gradnju:

Hrvoje Kvasnička, Predsjednik

Snježana Turalija, Izvršna direktorica

**SAVJET ZA ZELENU GRADNJU
ZAGREB**

HRVATSKI SAVJET ZA ZELENU GRADNJU / CROATIA GREEN BUILDING COUNCIL

Ulica grada Vukovara 274/1, 10000 Zagreb, Hrvatska T: +385 1 4886 296 F: +385 1 4886 297 E: info@gbccroatia.org
OIB: 99702507717 MB: 2537907 IBAN: Erste banka: HR6024020061100558523

www.gbccroatia.org

**KOORDINACIJA UDRUGA STANARA REPUBLIKE HRVATSKE**

51000 Rijeka, Velebitska br.8, koordinacija.stanara@gmail.com

OIB 25091163221, žiro račun 2340009-1110490801

Prima: Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“

U mojoj funkciji kao tajnika Koordinacije udruga stanara Republike Hrvatske, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- priprema programa radi kvalitetnijeg informiranja građana o potrebama angažiranja stručno obrazovanih i licenciranih djelatnika na zahvatima koji se provode sa ciljem energetske učinkovitosti u zgradarstvu.
- Izravnim priprema informiranja građana sa ciljem poticanja na ulaganje u energetske obnovu zgrada.

S poštovanjem,



TAJNIK KUSRH

Milan Jokić

**UDRUGA UPRAVITELJ**

10020 ZAGREB, Remetinečka cesta 7a

www.udruga-upravitelj.hr

tel 01/65 99 509 fax 01/65 99 512

Broj: 180-022/2011.
Zagreb, 11.11.2013.Prima: Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Sveučilište u Zagrebu, Građevinski fakultet
Fra Andrije Kačića Miošića 26
HR 10000 Zagreb**Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“**

U mojoj funkciji kao Predsjednik Udruge UPRAVITELJ, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

S poštovanjem,

kontakt:
Org.-stručne službe Udruge
tajnik Rade Ignjatović
091/65 99 502

Predsjednik Udruge UPRAVITELJ



Tomislav Štimac



Hrvatska Udruga za infracrvenu termografiju - HUICT

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Zagreb, 11.11.2013.

Prima: **Ivana Banjad Pečur**

Koordinator projekta CROSKILLS

Sveučilište u Zagrebu, Građevinski fakultet

Fra Andrije Kačića Miošića 26, HR 10000 Zagreb

Opis: Suglasnost s „Nacionalnim smjernicama za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“

U mojoj funkciji kao Predsjednika Hrvatske udruge za infracrvenu termografiju (HUICT), ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetske učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama.

Voljeli bismo sudjelovati u sljedećim aktivnostima:

- Mogućnost korištenja infracrvene termografije u kontroli kvalitete izvođenja vanjske ovojnice zgrade
- Infracrvenu termografiju moguće je koristiti i kao pomagalo pri učenju, čime bi se pridonijelo poboljšanju stručnosti i podizanje svijesti radnicima o prednostima principa gradnje vrlo niskoenergetskih zgrada, u odnosu na postojeće načine gradnje

S poštovanjem,


Krešimir Petrović, ing.

HRVATSKA UDRUGA
ZA INFRACRVENU TERMOGRAFIJU





HRVATSKO DRUŠTVO SUDSKIH VJEŠTAKA

UR.BROJ:To -190 /2013
Zagreb, 14.11.2013.god.

Cij.gđa Ivana Banjad Pečur
Kordinator projekta CROSKILLS
Sveučilište u Zagrebu,
Građevinski fakultet
Fra Andrije Kačića Miošića 26
10 000 Zagreb

**Predmet: Suglasnost s „Nacionalnim smjernicama za
kontinuiranu izobrazbu građevinskih radnika
u energetskej učinkovitosti“**

U funkciji predsjednice Hrvatskog društva sudskih vještaka, ovime potvrđujem našu suglasnost s predloženim mjerama u sklopu „Nacionalnih smjernica za kontinuiranu izobrazbu građevinskih radnika u energetskej učinkovitosti“ koje su razvijene u sklopu projekta CROSKILLS, financiranog od strane Europske komisije u sklopu programa Inteligentna energija u Europi.

Predložene mjere smatramo prikladnima za poboljšanje vještina građevinskih radnika te kako bi se osigurao dovoljan broj kvalificiranih stručnjaka za postizanje ciljeva energetske i klimatske politike u građevinskom sektoru. Pridonijet ćemo maksimalno u sklopu naših mogućnosti za implementaciju mjera predloženih u Nacionalnim smjernicama. Navedeno podržavamo kako bi se smanjio broj loše izvedenih zgrada i šteta proizašlih iz neznanja radnika na gradilištu, obzirom da godinama kontinuirano ukazujemo na probleme nekvalitetno izgrađenih zgrada u brojnim sudskim postupcima u kojima vještače naši članovi – sudski vještaci.

S poštovanjem,

Predsjednica HDSV-a:

mr.sc.Melita Bestvina,dipl.ing.građ.
stalni sudski vještak,
ovlašten inženjer



BUILD UP Skills

The EU SustainableBuilding Workforce inicijativa u području energetske učinkovitosti i obnovljivih izvora energije

BUILD UP Skills inicijativa je dio the Intelligent Energy Europe (IEE) programa čiji je osnovni cilj povećanje broja stručno osposobljenih radnika na tržištu, odnosno stvaranje radne snage koji posjeduju dovoljno znanje, ili su specijalizirani za gradnju niskoenergetskih, pasivnih i zgrada gotovo nulte energije te time jamče za kvalitetnu izvedbu zgrada.

BUILD UP Skills se sastoji od dvije faze:

I. U prvoj fazi projekta definira se trenutna nacionalna i nacionalne smjernice za kontinuiranu izobrazbu građevinskih radnika u dostizanju cilja 20-20-20 do 2020. godine.

II. U drugom dijelu projekta na temelju nacionalnih smjernica definirati će se plan i program izobrazbe te uspostaviti sustavna i kontinuirana izobrazba za građevinske radnike profila koji su vezani ili će biti potrebni za energetske efikasnu gradnju.

BUILD UP Skills inicijativa se provodi paralelno u 30 zemalja koje se bave jednakom tematikom, određivanja potrebnih kvalifikacija i razvoj smjernica za školovanje kvalificiranih radnika u području energetske učinkovitosti.

Inicijativa BUILD UP Skills pridonosi ciljevima koje je Europska komisija postavila kroz „Commission’s ‘Europe 2020’ strategy — ‘Resource-efficient Europe’ and ‘An Agenda for new skills and jobs’“, te je dio nedavno prihvaćenog Energy Efficiency Action Plan 2011. Također poboljšava se interakcija s postojećim strukturama i instrumentima financiranja kao što su European Social Fund i Lifelong Learning Programme, te će se temeljiti na European Qualification Framework (EQF) i njime definiranim ishodbima učenja.

