BUILD UP Skills – Greece

D5.1 Elaboration of a Strategic Plan for the Roadmap's Development

Further information

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 Introduction to the methodology for the elaboration of the Roadmap

The methodology followed for the elaboration of the National Roadmap is based on a synthetic procedure where all the deliverables/elaborated products and results deriving from the previous phases of the project, and most importantly the Status Quo Analysis and the results of the National Qualification Platform (NQP) Consultation Meetings held in the frame of the project, will be carefully considered. The elaboration of the National Roadmap is based on the preparation of the Strategic Action Plan, in five basic steps (Figure 1):

1. Formulation of the Strategic Planning Committee (SPC),
2. Selection of the priority professions in the building sector to be included in the Roadmap,
3. Determination of the process to be used in the Roadmap's development,
4. Assessment of priority measures' alternative scenarios.
5. Monitoring of the implementation of the various activities of the SPC and provision of the recommended guidelines.

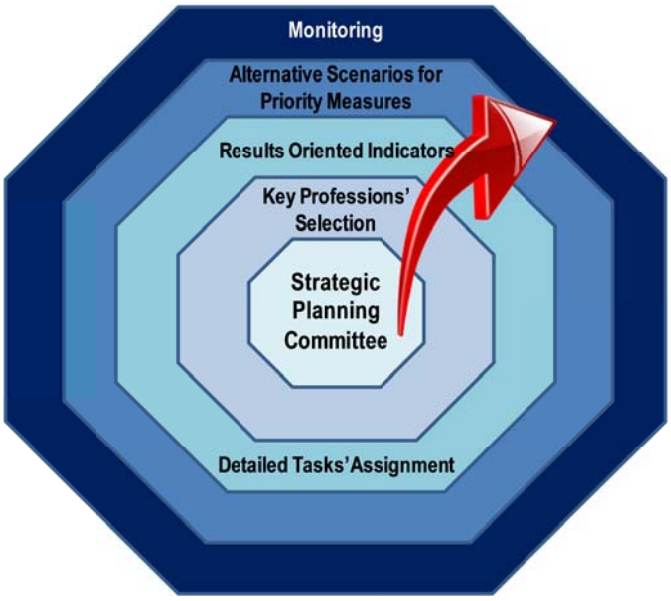

Figure 1: Elaboration procedure of the Strategic Action Plan

In the next Section (Strategic approach) further information on the formation and operation of the SPC is provided, while the elaboration procedure of the National Roadmap is more thoroughly analyzed. It is briefly mentioned that the synthesis of the National Roadmap will be materialized following four distinctive and sequential steps:

1. In the first step, a first (draft) version of the Roadmap will be prepared. This version is mainly based on the already completed deliverables of the project,

such as the Analysis of the National Status Quo, the needs and barriers analysis to 2020, the energy training and qualification priorities, and the recommended action plan.

2. The draft version of the roadmap is set under discussion and commenting from all the stakeholders participating in the National Qualification Platform (NQP).
3. In a further step, a more processed version of the Roadmap, imposed to a public consultation process, will be developed.
4. Finally, and taking into consideration all the comments and interventions made from the participants to the consultation procedure, as well as the relevant discussions and opinions during the 4th Consultation Meeting of the NQP, the final version of the National Qualification Roadmap will be published.

It has been planned, since the initiation of BUS-GR to actively involve all the interested authorities/decision makers and stakeholders, such as the competent ministries, the national authorities responsible for energy, employment, vocational training and certification of qualifications, federations of craftsmen, associations of constructors and equipment providers, unions of the training providers and of the workforce certification bodies, etc in the Roadmap's development procedure. The opinions of all interested parties will be taken into account and discussed during the NQP's consultation meetings. Therefore, the endorsement of the National Roadmap shall emerge as a logical continuation of the adopted actions and consultation mechanisms.

2 Strategic Plan for the development process of the National Qualification Roadmap

The development process of the National Qualification Roadmap, as followed by the BUS-GR consortium, has been designed to ensure the broad consensus among stakeholders, while at the same time, the whole process aims at preserving its strong consultative character with interested workers and craftsmen. The responsibility for the scientific development of the Roadmap lies with the consortium of BUS-GR, while the strategic directions are provided by the Strategic Planning Committee (SPC) assigned for this role.

Figure 2: Development process of the National Qualification Roadmap

The steps of the development process of the National Qualification Roadmap are described in detail the following 5 consecutive steps.

Step 1: Composition of the Strategic Planning Committee (SPC)

The Strategic Planning Committee (SPC) has an advisory role, and supports the overall decision-making process for the development of the National Qualification Roadmap. The Committee consists of 10 experts, representatives of 8 organizations / institutions, including ministries, national energy and certification of qualifications agencies, technical universities, labour confederations, etc. In particular, the BUS-GR partners participating in the SPC are:

- Centre for Renewable Energy Sources and Saving (CRES),
- National Technical University of Athens (NTUA),
- Technical University of Crete (TUC),
- National Organization for the Certification of Qualifications and Vocational Guidance (EOPPEP),
- Hellenic Confederation of Professionals, Craftsmen and Merchants (IME-GSEVEE),
- Greek General Confederation of Labour (INE & KANEP of GSEE).

Stakeholders outside the BUS-GR consortium participating in the SPC are the following:

- Ministry of Environment, Energy and Climate Change (MEECC), and,

- Manpower Employment Organization (OAED).

The ultimate role of the SPC is the definition of strategic national priorities, the technical support for the identification of high-priority occupations, the evaluation of the alternate future scenarios and the synthesis of the proposed measures and actions. Furthermore, this specific committee is responsible for the finalization processes of the Roadmap after the completion of the consultation procedures.

Since the role of the committee is not only focused on the identification of technical proposals, but also on the coordination of works and the verification of the results derived through the NQP's meetings, the decision process of the Committee has already been defined and clarified. Thus, each stakeholder taking part in the SPC has the right of a single vote in the decision making process, while the validation of a decision requires at least 75% of the votes. In any case, the SPC's objective is to achieve consensus among the stakeholders through extensive discussion and consultation on their strategic decisions. For the better coordination of the committee's tasks and for monitoring the progress of work related to the Roadmap, committee meetings are going to be scheduled every 2-3 months.

Step 2: Selection of the building sector professions to be prioritized for inclusion in the National Roadmap

The selection of the professions to be included in the Roadmap has been planned to be a procedure integrating both statistical stats, which have already been analyzed in the status quo analysis and the personal opinions of stakeholders and experts in the field, stemming mainly from the qualitative needs of the workforce.

It has been made clear since the elaboration of the status quo analysis that the entire Greek construction sector contains employees that are not related to the objective of the BUILD UP Skills initiative, such as engineers, office workers, business managers, drivers transport, etc. The professions associated with tasks related to energy efficiency in buildings and the construction of energy autonomous buildings consist of the following categories:

<u>Installations</u>

- ***Electrical technicians - Electrical installations*** (solar panels, photovoltaic systems, sustainable lighting, power quality, electrical monitoring of buildings).
- ***Mechanical installations*** (heating systems, air conditioning systems, heat pumps, energy production (biomass - sun), ventilation, thermal monitoring of buildings).
- ***Roof technicians*** (solar panels, photovoltaic systems, wind energy).

<u>Constructions</u>

- ***Masons - Builders - Plasterers*** (thermal insulation, protection from moisture).
- ***Carpenters*** (joinery energy efficient of floors, walls, roofs, windows, doors).
- ***Technicians of roofing*** (roofing insulation).
- ***Glaziers*** (installing glazing windows, doors and frames) –

Note: this category includes also aluminum frame installers.

Specifically, the jobs of interest concern the professional classes 711, 712 and 741 of ISCO[1] classification, as described in detail in Table 1, together with the current numbers of professionals. The data were obtained by ELSTAT and concern the third quarter of 2012. The last column of the table shows the annual influx of young people in particular occupations through career education system of Greece (VET).

It should be noted that further distinguish of the number of employees per four-digit-occupation category according to ISCO is not provided by ELSTAT. Especially for the category of builders and related occupations (711), it is not practically feasible to find the four-digit number per category. This is because of the fact that those professions do not require any type of training or qualifications and so workers can execute more than one of them, if there is a need in the building. An additional element preventing the above is the lack of jobs and the increased unemployment, due to the collapse of the Greek building sector, pushing many people in the broader category of masons to exercise other occupations to earn their living.

On the other hand, concerning the craftsmen of category 712, the finding of their absolute numbers per 4-digit category according to ISCO was achieved by contacting individuals of their respective federations. More specifically:

- The plumbers, fitters and boiler pipe installers (class 7126) currently stand at 15,000 persons, with an annual inflow of 1,000 people in the profession.
- The artisans, conditioning and refrigeration of class 7127 are amounted to 5,000 with an annual influx of 500 new professionals in the field.
- The glaziers of category 7125 correspond to 18,000, and each year 1,500 young professionals enter the industry.
- As for classes 7121, 7122, 7123 and 7124, no separate detailed statistics were found of the exact number because they correspond to related professions and each person may perform more than one of them. However, in accordance with their respective federations' approximate data, they are estimated to 7,000.

Table 1: Absolute number of workers involved in energy saving and RES systems installation in buildings and annual inflow

Professions' classification according to 3-digit ISCO-08	Professions' classification according to 4-digit ISCO-08	Absolute number of technicians	Annual inflow of new professionals
711 - Building frame and related trades workers	7111 - House builders	55.000	Negligible
	7112 - Bricklayers and related workers		
	7113 - Stonemasons, stone cutters, splitters and carvers		

[1] International Standard Classification of Occupations (ISCO-08), retrieved online from: http://www.ilo.org/public/ english/bureau/stat/isco/isco08/index.htm

	7114 - Concrete placers, concrete finishers and related workers		
	7115 - Carpenters and joiners		
	7119 - Building frame and related trades workers not elsewhere classified		
712 - Building finishers and related trades workers	7121 - Roofers	45.000	3.800
	7122 - Floor layers and tile setters		
	7123 - Plasterers		
	7124 - Insulation workers		
	7125 - Glaziers		
	7126 - Plumbers and pipe fitters		
	7127 - Air conditioning and refrigeration mechanics		
741 - Electrical equipment installers and repairers	7411 - Building and related electricians	9.000	700
Total		**109.000**	**4.500**

- In conclusion, employees in the construction industry related to the construction of energy-autonomous buildings and installing renewable energy systems in these now total at **109,000** and represent **53%** of all workers in the industry.

The above described procedure was used to discriminate the current workforce in the construction sector in order to calculate the quantitative needs for qualifications and training. In a further step, the future needs for workforce was estimated, to get a more thorough view on the Greek professionals required to enter the sector till 2020.

All the extracted data from the analysis on the quantitative needs, concerning the trained workforce needed to enter the building sector to achieve the national energy targets for 2020, have been presented clearly in the Status quo analysis. They are gathered in Table 2, regarding the needed professionals to refurbish the existing buildings.

Table 2: Expected employment technicians for building energy upgrades and installation of renewable energy systems for the period 2013-2020

Buildings' reconstruction and RES installation works	Need for skilled craftsmen annually till 2020
Glazing Replacement	6.450
Facade Insulation	18.780
Roof Insulation	1.170
Heating Systems' Replacement	1.405
Solar Collectors	605
PV Systems	500
Total	**28.910**

In addition, with a similar percentage assignment (53%) in the size of the construction sector forecast for 2020, derives the total number of workers and technicians on EE and RES required for constructing the new buildings till the end of the decade. This number stems from the simulation of three possible future scenarios of the building activity in Greece; an optimistic, a pessimistic and a neutral one. The results, as calculated in the status quo analysis are summarized in Table 3.

Table 3: Aggregated employment related to the construction of new buildings by 2020

Reference Year 2020	Technicians/ Craftsmen on RES and EE	Additional required Technicians/ Craftsmen
Optimistic Scenario	170.000	61.000
Pessimistic Scenario	90.000	- ®
Neutral Scenario	133.000	24.000

® In the case of the pessimistic scenario, no additional technicians for new homes are needed, as there are already 109,000 (there is actually a surplus of 19,000 labourers for the construction of new buildings currently in relation to 2020).

Need for training the professionals

Then, the existence of available training of artisans and laborers for the learning of each skill was studied. The training can be provided either by the National Vocational Training System (EPAL, IEK etc.) or various professional programs - seminars that may pertain to the theoretical and practical training of professionals (CVET). Finally, it was recorded if the general skills related to each task of energy saving are certified by a certification process by the governmental agency EOPPEP.

All findings of the above methodology are presented in detail in the following generalized table.

Table 4: Classification of new technologies and skills, inventory of existing training and certification

Type of construction activity	Classification of activities according to NACE	RES/EE related Activity/Skill	Available Training	Skill Certification
Buildings' construction	F41.2.0 - Construction of residential and non-residential buildings	Reconstruction of buildings' foundations	No	No
		Building shell reconstruction	No	No
Plastering and Insulation	F43.3.1. - Plastering F43.2.2 - Floor and wall covering	Specification in high quality building shell insulation	No (or sporadic by companies active in the field)	No
		Specification in high quality floor	No	No
		Specification in high quality roof insulation	No (or sporadic by companies active in the field)	No
		Installation of high insulation quality frames	No (or sporadic by companies active in the field)	No
Electrical installations	F43.2.1 - Electrical installation	Specification in the installation of PV systems	Not in a systematic basis	Yes (certif. of course attendance)
		Installation of sustainable lighting systems	Not in a systematic basis	Yes (certif. of course attendance)
		Buildings' energy monitoring	Not in a systematic basis	Yes (certif. of course attendance)
Mechanical installations	F43.2.2 - Plumbing, heating and air conditioning installation	Effective replacement of heating systems	Not in a systematic basis	Yes (certif. of course attendance)
		Effective replacement of air conditioning systems	Not in a systematic basis	Yes (certif. of course attendance)
		Specification in ventilation systems	Yes	Yes
		Specification in heat pumps (air source, geothermal)	Not in a systematic basis	Yes (certif. of course attendance)

Glazing installation	F43.3.4 - Painting and glazing	Specification in high insulation quality glazing	Not in a systematic basis	Yes (certif. of course attendance)
		Specification in sun proof windows	Not in a systematic basis	Yes (certif. of course attendance)
Roof construction	F43.9.1 - Roofing activities	Installation of solar thermal systems	Not in a systematic basis (sporadic by companies active in the field)	Yes (certif. of course attendance)
		Specification in green roofs	No	No
Joinery works	F43.3.2 - Joinery installation	Installation of doors and windows	Sporadic (by companies active in the field)	No
		Reconstruction of wooden floors	No	No
		Reconstruction of wooden roofs	No	No
		Installation of glazing in wooden frames	Sporadic (by companies active in the field)	No

From the findings of the above paragraph, it is evident that in Greece there is a great need to educate the workforce in the construction industry. Admittedly, as was already mentioned, the ability of workers to cope effectively with the tasks in the ES and install renewable energy systems should be reviewed through monitoring mechanisms, continuing education and certification of individual qualifications.

However, the distinction of the workforce between people who need further training and people who are already trained, according to the educational needs proposed by the EU, is a hard work. This distinction is more related to the impact of the activity performed by each different professional group, i.e. the extent to which each will contribute to the energy goals of 2020 (see Section 7.2 of the status quo analysis).

In a further analysis, based on the opinions of stakeholders it was attempted to define the professions of high priority for training. The question "*which technical professions of the construction sector should be prioritized for inclusion in the Roadmap?*" was posed to - with the aid of a properly designed questionnaire – even from the kickoff meeting of the NQP established in the frame of BUS-GR. The NQP members' responses concerning the occupations that should be trained in priority on the RES and EE technologies / techniques are illustrated in the following tag cloud.

Figure 3: Occupations of high priority for training over RES and ES/EE in the constructions sector, according to the stakeholders

Conclusion: This lack of certification, the general view that there is a big gap of skills of employees in RES activities and energy saving in existing buildings and in new ones to be built by the end of the decade, as well as the strict objectives for energy saving in Greece by 2020, lead the Roadmap to propose measures that will address the training of all blue collar workers of the Greek construction sector.

Step 3: Determination of the development process of the National Roadmap

An analytical allocation of tasks will be applied in order to better coordinate the inputs required by the members of the NQP and the partners of BUS-GR. The SPC will monitor and control the timetables of the activities, as well as relevant objectively verifiable indicators to monitor the normal progress of the project. In addition, to ensure the closer and more effective involvement of the NQP members, different sets of questionnaires will be developed and distributed to the platform's members, investigating and recording their views and priorities. The results of this research will then be discussed extensively in relevant meetings of the NQP in order to clarify any possible concerns, and conclude on the main priorities of the Roadmap.

The procedure for the determination of an Action Plan to support the National Roadmap's implementation is graphically presented in Figure 4. Initially, 3 major axes were formulated, over which emphasis should be given, to accomplish the objectives of the National Roadmap. These axes, then, are specialized and – under each one of them - a number of measures to overcome specific barriers, reported also by the members of the NQP, are proposed. Finally, the priority measures identified will be decomposed and analyzed to specific actions providing a detailed action plan towards 2020, completing thus the National Qualification Roadmap.

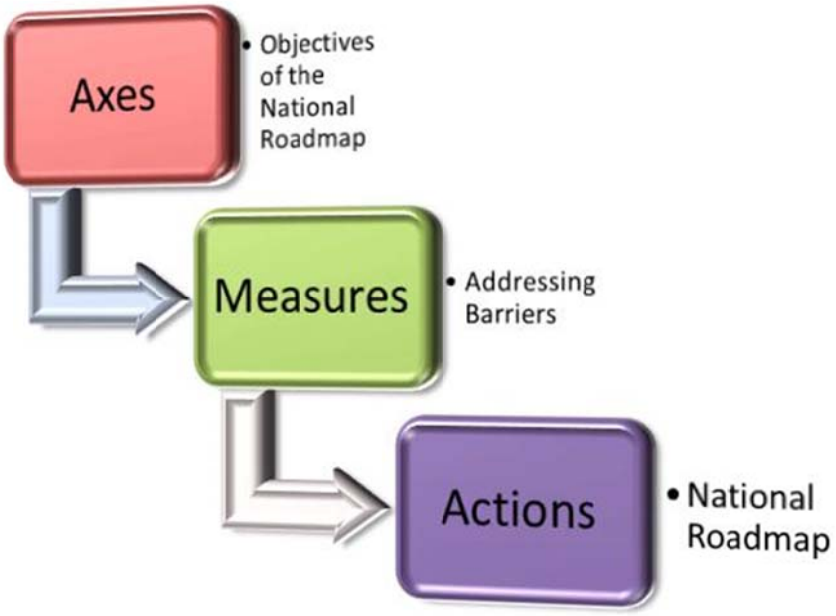

Figure 4: The three stages determining the Action Plan under the National Roadmap

Based on the above approach, a draft version of the National Qualification Roadmap will developed. In this draft outline, a summary report on the most important findings of the work done in the original work packages, such as the status quo analysis, the needs and barriers analysis up to 2020 and the priorities for the continuous vocational training (professional development) and up skilling of craftsmen, will be included. It will also include the results to derive from the NQP's consultation meetings, the field research to be conducted through questionnaires and the suggestions to be received through the electronic consultation platform (Figure 5).

Figure 5: Website of BUS-GR initiative and the embedded online consultation platform

The draft version of the Roadmap will form the basis for the thorough consultation, suggesting an additional series of activities such as:

- Study of the necessary incentives to be provided to the workers and craftsmen, i.e. scholarships and learning opportunities.
- Structural measures to monitor the developments in the field and the trends with regard to the qualifications of the building sector's craftsmen.
- Determination of the involved actors and of the intensity of their participation, in accordance with their influence and level of authority to the successful implementation of the proposed measures and actions.

In the context of the 2nd and 3rd consultation meetings that were organized in the premises of GSEVEE on the 11th of July 2013, a fruitful dialogue was conducted among the National Qualification Platform (NQP) members, which was initiated in the frame of the BUS-GR Project in order to focus on the critical parameters related to the planning and development of the National Roadmap. Following the discussions and the findings of the Status Quo Analysis (Status Quo – Gap Analysis), three specific major axes were identified, on which light should have been shed to find solid solutions towards the attainment of the objectives of the National Roadmap.

These three axes are the following:

1. Ensure the required number of workers/technicians in the construction sector.
2. Enhance the skills of workers/technicians in the construction sector.
3. Overcome the institutional barriers and ensure the sustainability of the initiative.

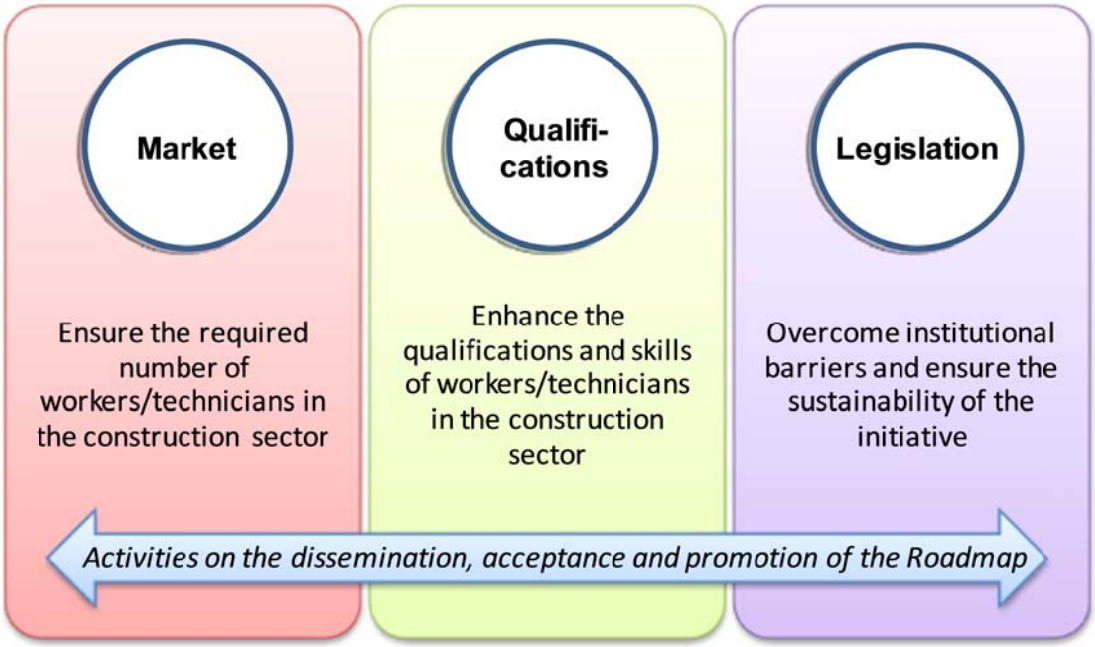

Figure 6: The three axes framing the attainment of the objectives of BUS-GR

The proposed sets of measures are supported by a series of horizontal actions, concerning the information and awareness rising of:

- Workers and craftsmen in the constructions sector on the necessity for continuous updating and enhancing of their skills and the benefits arising from the recognition of their qualifications
- Citizens in order to inform them of the benefits of preferring certified technicians.

The barriers to be addressed by the Roadmap's measures have already been defined and evaluated by NQP members. During the analysis of the questionnaires that were distributed to the NQP members, at its first Workshop, several obstacles were found regarding the meeting of energy targets set for 2020.

According to a relevant inquiry addressed to the stakeholders as regards the "*Main obstacles for the improvement of the vocational qualifications of the technicians in the building sector*", the answers collected are graphically presented in Figure 7.

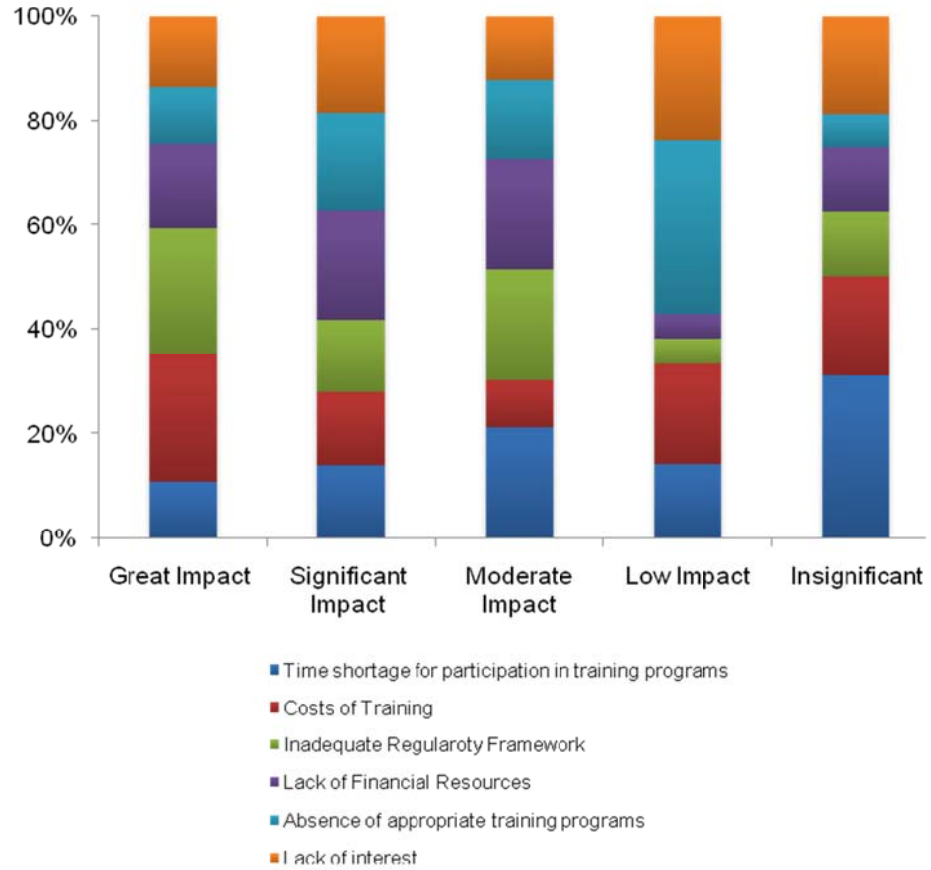

Figure 7: Results of the responses to the question "*According to your opinion what are the main obstacles to the improvement of the vocational qualifications of the technicians in the building sector? Rate with grades from 1 to 5 (Insignificant - Great Impact)*"

As it is obvious from the figure above, the **training cost** and **the inadequate institutional framework** are considered to be the two obstacles with the greatest

impact, while the lack of **financial incentives** follows. The rest of the obstacles are following an isobaric/balanced distribution and these include the lack of the suitable training programs, the lack of availability to participate in such programs, as well as the reduced interest of the technicians themselves for any training.

Step 4: Evaluation of the proposed measures and prioritization

Following consultations amongst the NQP members and further discussions made between the members of the Strategic Planning Committee, a process and evaluation methodology concluding to a global evaluation system of the proposed measures were mutually decided. The proposed measures will be assessed over a set of evaluation criteria to determine the priorities of the Roadmap up to 2020. The evaluation system is analyzed in three dimensions that are further divided to form the distinctive evaluation criteria.

The contribution of each measure in each dimension will be evaluated in a qualitative scale and in a second phase the measures will get categorized into High Priority, Medium Priority and Low Priority, depending on the overall score they obtain. The final classification of the measures will be discussed and endorsed during discussions with stakeholders and the SPC meetings.

Specifically, the development of an integrated evaluation system of the aforementioned measures, in order to form the priorities of the Roadmap towards 2020, is proposed. Initially, the problem, (i.e. evaluation and prioritization of the measures) is defined and described to support its further analysis. Then, it is decomposed into a limited number of dimensions, from which the individual evaluation criteria emerge.

The whole fabrication process of a consistent family of criteria is executed according to the classical modeling methodology of Roy 1985[2]. This process has been recognized as essential and irreplaceable towards a substantiated and appropriate decision support in accordance with the Multicriteria Methodologies of Decision Making (MCDA-M, acronym of the Multicriteria Decision Aid and Making). This scientific field is continuously evolving and developing over the last 40 years and has achieved its wide implementation and application in both managerial and political context decision-making problems (Figueira et. al. 2005[3]).

At an **initial stage**, following a consultation phase with members of the NQP and the relevant analyses by the SPC members, the process and the evaluation methodology of the Roadmap's measures was decided, with the use of a commonly accepted evaluation system. This system consists of three general dimensions that lead to the fabrication of the evaluation criteria, as shown in Figure 8.

[2] Roy, B. (1985), "Méthodologie multicritère d'aide à la décision", Economica, Paris.

[3] Figueira, J., Greco, S., Ehrgott, M., Eds. (2005), "State-of-Art of Multiple Criteria Decision Analysis", Kluwer Academic Publishers, Dortrecht

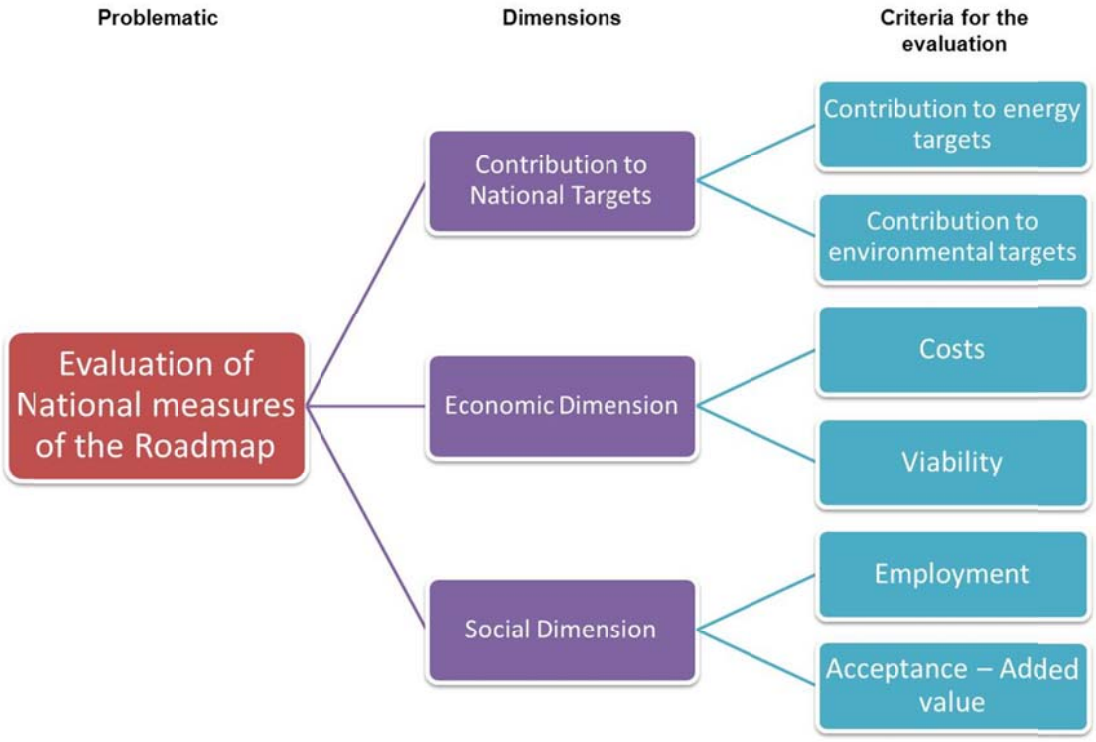

Figure 8: Dimensions and evaluation criteria of the Roadmap's measures

The dimensions selected for the integrated evaluation of the proposed series of measures are the following:

I. The measure's contribution to the national objectives of Greece
II. The economic dimension, referring to both the cost of the measures and the economic benefits arising from their implementation, and
III. The fulfilment of the national social needs

Each dimension is then divided into the individual evaluation criteria that constitute it. These criteria, in order to be in accordance with the multicriteria theory, are required to be preferentially independent to the decision makers and to respect the monotonicity property (strictly increasing - decreasing).

The **second stage** consists of the assignment of scores of each individual measure on the set criteria. Then, these scores-ratings are aggregated evenly to extract each suggested measure's score on the dimensions level.

The contribution of each measure over any defined criterion and dimension is expressed qualitatively, in a three stage distinct and ordered scale, with the aid of linguistic variables, as follows:

Table 3.2: Rating scale of the measures to export priorities

Rating	Contribution
+	Low
++	Medium
+++	High

The discrete and ordered scale with linguistic variables technique is widely used worldwide in a variety of classification problems due to the immediacy and clarity of the final results it provides[4,5].

The **third and final stage** of the evaluation procedure consists of the aggregation of the individual ratings for each measure provided by the members of the SPC, as extracted in the 2nd stage, to an overall one for each measure. Depending on their total scores over the three dimensions, the measures will be finally classified into **3 categories:**

(1) Measures of high priority,

(2) Measures of medium priority, and,

(3) Measures of low priority.

It must be mentioned that, the Action Plan of the National Qualification Roadmap that will be developed at the end of the procedure will be constituted of the high priority measures and actions, as these are confirmed through the above process.

Step 5: Finalization of the National Roadmap and Endorsement

The draft version of the Roadmap will initially put under consultation between the members of the NQP, in order to formulate an enhanced and updated version to be used for public consultation purposes.

To achieve a more efficient and wide public consultation of the Roadmap, a web platform (http://busconsultation.epu.ntua.gr/) has already been designed and launched exclusively for this scope by the consortium. The public consultation procedure will be operational and open to the public for more than a two months period.

Upon completion of the consultation process, all comments and suggestions provided by the NQP members will be considered for integration in the manuscript of the National Roadmap. The new version will then be reviewed by the SPC, and the final version of the National Qualification Roadmap will get endorsed through voting.

[4] Doukas H., "Modelling of linguistic variables in multicriteria energy policy support", *European Journal of Operational Research*, 2013, 227 (2), pp. 227-238.

[5] Herrera, F., & Herrera-Viedma, E. (2000), "Linguistic decision analysis: steps for solving decision problems under linguistic information", Fuzzy Sets and Systems, 115, pp. 67-82.

All the aforementioned tools that will be implemented for the development and finalization of the National Qualification Roadmap for Greece are presented graphically (indicating also their interactions) in Figure 9.

Figure 9: Tools towards the development and finalization of the National Roadmap