

Building Capacities for Sustainable Energy in Municipalities of Western Balkans

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Abstract

This paper discusses challenges of capacity building in sustainable urban energy planning and development in Western Balkan Countries (WBC). It identifies needs in training of municipal staff and addresses obstacles for transferring sustainable energy education from EU universities to universities of WBC. The analysis of the ten training courses developed and piloted in collaboration with academic and non-academic stakeholders in Bosnia and Herzegovina, Montenegro and Serbia shows that while international cooperation has a good potential to improve quality of capacity building and to catalyse university-society collaboration in WBC, significant efforts on national and local (university) levels are needed to fully capitalise on these opportunities. In particular, it is necessary to enhance an interdisciplinary approach to education in sustainable energy, incorporating economic, social and institutional aspects of energy production and consumption together with the technical ones. On the national level, the lifelong learning system should get political and financial support in WBC to ensure efficiency and continuity of the training activities.

1 Introduction

The transition to a sustainable energy system is essential for reaching Sustainable Development Goals (SDGs) adopted by the world leaders at the United Nations Sustainable Development Summit in 2015. While *Affordable and Clean Energy* is highlighted as one of these goals, energy issues are central for achieving the whole set of SDGs to end poverty, fight inequality and injustice, and tackle climate change by 2030. Correspondingly, reliability and efficiency of the energy infrastructures are

recognised as crucial factors for the quality of life and sustainable economic growth in the Western Balkan Countries (WBC¹) (International Energy Agency, 2008).

Knowledge, education and the capacity to develop new knowledge is of primary importance for sustainabilising energy systems (Hekkert et al., 2011). The knowledge that is required is not just the knowledge to develop new generic technological systems, but especially the knowledge to pick the right energy systems for the local conditions, and to use these conditions optimally to sustainabilise the pre-existing energy systems. Both the geophysical conditions as well as the economic and cultural local conditions are important. Hence, training local decision makers and operators of energy systems is of great importance (Lalic et al., 2011).

A number of programs for development of sustainable energy infrastructures were implemented in the WBC since the EU Instrument for Pre-Accession Assistance (IPA) had been launched in 2007. Enhanced capacity of public authorities in energy efficiency, energy infrastructure, renewable energy and environmental protection were among the expected outcomes of these programs. However, local authorities in WBC are still lacking knowledge and skills necessary for making both operational and strategic decisions on sustainable energy, which in several cases led to ironic consequences when municipalities failed to use technical assistance funds due to inability to formulate applications for so needed infrastructure projects (Anger, 2012).

The underlying problem is twofold: on one hand, the lifelong learning system is underdeveloped in WBC; on the other hand, the intensive training courses by foreign experts have a number of limitations, such as a) neglecting the local context and differences between existing practices and procedures in EU and WBC; b) language barrier; c) prevailing one-way lecturing; d) limited possibility for after-training support and networking with the trainers; and e) high cost.

One of the ways to overcome the problem is establishing training activities by local actors, in particular, local universities, which in turn is a challenging task as WBC universities as a rule have rather limited experience in collaborative projects with municipalities, industries and other non-academic stakeholders. While knowledge transfer from experienced universities has a potential to meet this challenge, the simple copying of training curricula would fail to reflect the local conditions both in terms of required knowledge and skills, and in terms of institutional capacity of local universities to provide the trainings. Thus, it is necessary to adapt international experiences to needs, expectations and constraints of both local trainees and trainers.

In this study we attempt to bridge a gap in understanding of needs for capacity building in sustainable urban energy planning and development in WBC, and to investigate obstacles for transferring sustainable energy education from EU universities to local universities.

2 Approach and Methods

This study is based on findings of the EU-funded project "Training Courses for Public Services in Sustainable Infrastructure Development in Western Balkans" that was conducted in 2012-2015 by the project consortium consisting of universities from EU, Bosnia and Herzegovina, Montenegro and Serbia and the society partners - associations of local authorities that represented municipalities of the partner countries (e.g. Association of Municipalities and Towns of Republic Srpska, Bosnia and Herzegovina; The Union of Municipalities of Montenegro; and The Association of Towns and

¹ Hereinafter we mean Albania, Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Montenegro, Serbia, and Kosovo under UN administration

Municipalities of Serbia). The project addressed the regional needs in capacity building required for development of the energy infrastructures in WBC, focusing on three priority areas: 1) Sustainable Urban Development; 2) Sustainable Energy Infrastructure; and 3) Good Governance. The project resulted in development and implementation of ten training courses in the selected topics relevant to the aforementioned priority areas. More than 300 stakeholders have been retrained during the training program. Besides, 33 teachers and 13 representatives of local authorities have been retrained at EU Universities.

While generalisability cannot be claimed by this case study, its conclusions can be of interest for capacity building activities in the whole region. This is mainly because of three reasons: firstly, due to geographical and historical similarity, WBC share many common challenges regarding their energy systems. According to International Energy Agency (2008), the core elements of the energy infrastructure in the region were built in the 1960s and 1970s using standard low energy efficient technology. The age and poor maintenance of the energy infrastructure during the 1990s cause an urgent need for renovation or replacement. Besides, Western Balkans have strong dependence on imported hydrocarbon fuels (though, there are substantial differences between the countries in energy mix and dependence on energy import). To overcome these challenges, all countries in the region launched energy reforms with capacity building as an important enabler of transition to more sustainable energy systems. Secondly, participation of associations of local authorities in the project countries or their parts (e.g. Serbia; Montenegro; and Republic Srpska, Bosnia and Herzegovina) allowed us to get insights into problems, needs and potentials, shared by large number of municipalities in the region. Thirdly, the project involved leading universities in the partner countries, which makes it highly probable that the challenges and barriers experienced by them would be relevant for many other Universities in the region.

2.1 Research design

The empirical data of this study were collected and analysed within all three stages of the SDTRAIN project, namely pre-project assessment, planning of the training courses, and implementation and evaluation of the courses. The overall research design is presented in Table 1.

The main methods used included interviews with teachers, representatives of associations of municipalities, representatives of funding agencies and trainees; literature review (predominantly energy- and capacity building- related reports for WBC); observation of the training activities; and analysis of the project outcomes (e.g. number of trainees, coverage of the training topics, unexpected spin-offs etc). The Consensus Dynamic Workshop and Delphi survey were used for needs analysis as presented in the Section 2.2.

Table 1: Research design

Stages	Activities	Involved stakeholders
I. Pre-project assessment	<ul style="list-style-type: none"> - literature review - interviews 	<ul style="list-style-type: none"> - teachers - representatives of associations of municipalities - representatives of funding agencies
II. Planning of the courses	<ul style="list-style-type: none"> - literature review - survey - Consensus Dynamic Workshop 	<ul style="list-style-type: none"> - Teachers - representatives of associations of municipalities

		– Delphi survey	
III. Implementation & evaluation of the courses		– observation of the training activities – interviews – analysis of the project outcomes	– teachers – representatives of associations of municipalities – trainees

2.2 *Methods of needs analysis*

The needs analysis was performed using a participatory approach with involvement of all local authorities participated in the project. It was organised in three steps:

First, a *Preliminary Survey*: simple questions to gather views of the participants on the three areas of interest (Sustainable urban development, Sustainable energy infrastructure and Good governance).

Second, a *Consensus Dynamic Workshop* (1.5 hours): based on the preliminary survey, the group brings together the results, identifies areas of agreement and seeks agreed definitions, and prioritizes keywords. The session was structured as follows:

- Presentation of first results on keywords from the preliminary survey;
- Collective definition of keywords;
- Work in groups: filling in the missing concepts;
- Sharing ideas;
- Voting for keywords.

And finally, *Post-workshop Delphi survey* (Hasson et al., 2000) aiming to collect the priorities of the partners on:

- a) What their needs are and how they are covered by the outputs of the process;
- b) What the target destination of training courses is;
- c) What the universities should certify and how this certification is to be recognized.

3 **Results**

3.1 *Identified needs*

From the preliminary survey (see Section 2.2) the trainees' profile was identified as:

- Engineering, architecture, economics and law education background;
- Long experience in local governments;
- Diverse professional profiles;
- Different levels of responsibility;
- Interested in sustainability (voluntary participation);
- Have training / knowledge in energy management and energy efficiency;
- Special interest in studying in depth sustainable urban development (SUD) and good governance.

In relation to the three areas of interest, the main training demands/needs are clustered in Table 2.

Table 2: List of the keywords relevant to the three areas of interest identified through group consensus

	Sustainable Urban Development	Sustainable Energy Infrastructure	Good Governance
Knowledge & understanding	Sustainable infrastructures	Supply security	Corruption
	Energy efficiency and water supply	Transport and Buildings	Transparency / control
	Low energy consumption	Environmental & Social impacts	Information / awareness rising / change behavior
	Mobility	Waste management	Best practices / Models
	Local energy production	Local distribution networks	Public Private partnerships
	Sustainable indicators expertise	Waste-to-energy	
	Innovation	New tech / smart grids / RES	
	Social development	Efficiency	
	Individual welfare	Functional (effective and flexible)	
	Resilience	Policy and regulations	
Instrumental competences	Environmentally friendly		
	Integrated approach: building, development, growth	Planning	Long term thinking
	Communication	Lifelong learning	Multidisciplinary approach
	Lifelong learning		Strategic planning on national and local levels
Required processes	Teamwork		
	Integration of SUD in strategic municipality plans		Good communication from government and municipalities
	Sharing knowledge, exchanging experience		Build trust and support from stakeholders
	Good interdisciplinary cooperation		Participation of civil society
			Help low income and vulnerable people

Trainees expressed interest in training related to different phases of planning and implementation processes (policy design, territory planning, infrastructure development and awareness-raising) with special emphasis on awareness-raising programs. The following needs were explicitly stated:

- To learn how to develop strategic energy plans and to implement projects on energy infrastructure development;
- To prepare concrete energy efficiency projects;
- To understand the “true meaning” of sustainable development;
- To implement awareness-raising programs among population;
- To transform global policies into local strategic plans.

According to trainees, the courses should encompass the following topics: social dimension of sustainability; examples and best practices in sustainable local management and local management transparency; social innovation processes. Further, the courses should provide cross-cutting competences on team working and communication tools; and tools that facilitate stakeholders/civil society participation in decision-making.

Finally, the trainees specifically asked for combining theoretical and practical teaching methods. According to them, the theoretical foundations are necessary in order to consolidate individual visions on sustainability, especially on the social dimension of the sustainability concept. The practical part is

needed in order to understand the process dynamics. It should allow the participants to transfer their acquired knowledge to their working environment.

Following the needs analysis, ten courses were designed and piloted in collaboration of WBC and EU universities taking into consideration the identified needs and expertise of partner universities. The overview of the courses is provided in Table 3.

Table 3: Training courses

Course title	Implementing universities	Where and when the course was piloted	Setup of the pilot course
<i>Sustainable indicators for municipalities</i>	University of Belgrade UPC	Niš, Serbia December 3, 2013 March 20, 2014	2 full-day workshops <ul style="list-style-type: none"> lectures practical work in Moodle in between
<i>Energy system analysis</i>	University of Kragujevac TU Delft	Kragujevac, Serbia December 6, 2013	1 full-day workshop <ul style="list-style-type: none"> lectures individual tasks
<i>Renewable energy</i>	University of East Sarajevo University of Banja Luka	East Sarajevo, Bosnia and Herzegovina December 16, 2013	1 full-day workshop <ul style="list-style-type: none"> lectures individual tasks
<i>Energy efficiency in public buildings</i>	University of Montenegro	Podgoritsa, Montenegro February 5, 2014	1 full-day workshop <ul style="list-style-type: none"> lectures group work practical modules in Moodle
<i>Participatory backcasting for the city heating system</i>	University of Belgrade University of Kragujevac KTH	Niš, Serbia April 4, 2014 – June 27, 2014 – February 20, 2015	3 full-day workshops <ul style="list-style-type: none"> lectures group work group presentations
<i>Energy efficient renovation and retrofitting approach</i>	University of Belgrade	Kula, Serbia February 4, 2014 July 2, 2014	2 full-day workshops <ul style="list-style-type: none"> lectures practical work in Moodle in between
<i>Energy planning, methodologies and tools</i>	University of Kragujevac KTH	Kragujevac, Serbia December 6, 2013 June 6, 2014	1 full-day workshop <ul style="list-style-type: none"> lectures individual tasks
<i>Scenario methods in energy planning for local communities. Planning of new urban areas for local communities</i>	University of Banja Luka University of East Sarajevo	Banja Luka, Bosnia and Herzegovina June 30, 2014	1 full-day workshop <ul style="list-style-type: none"> lectures group work
<i>Development of sustainable energy infrastructure</i>	University of Banja Luka University of East Sarajevo	Jahorina, Bosnia and Herzegovina December 4, 2014	1 full-day workshop <ul style="list-style-type: none"> lectures group work preliminary tasks in Moodle
<i>Renewable energy management</i>	University of Montenegro	Podgoritsa, Montenegro October 10, 2014	1 full-day workshop <ul style="list-style-type: none"> lectures group work

3.2 Identified barriers

The barriers for capacity building and obstacles for transferring sustainable energy education from EU universities to universities of WBC were identified through analysis of the training needs that have not been met by the developed courses, and through interviews with trainers and trainees.

Analysis of the keywords that were not fully addressed by the developed courses (see Table 4) shows that the vast majority of the keywords related to technology-related knowledge and skills was covered

by the developed courses. The only exceptions were transport and waste topics that were excluded mainly due to the project limitations (e.g. time and budget). At the same time, the economic, institutional and social topics as well as some ‘soft’ skills were only partly or superficially addressed. Obviously, the lack of experiences in multidisciplinary and interdisciplinary education and research at Engineering Faculties of partner universities was one of the reasons for this shortcoming. Despite this issue being discussed from the beginning of the project, introduction of multidisciplinary approach to energy education and training remains a challenge to address in WBC.

Table 4: Keywords that were not fully addressed by the developed courses

	Sustainable Urban Development	Sustainable Energy Infrastructure	Good Governance
Knowledge & understanding	<i>Mobility</i>	<i>Transport</i>	Corruption
	Innovation	Social impacts	Transparency / control
	Social development	<i>Waste management</i>	Public Private partnerships
	Individual welfare	<i>Waste-to-energy</i>	
Resilience			
Instrumental competences	Communication		Multidisciplinary approach
	Teamwork		
Required processes	Good interdisciplinary cooperation		Good communication from government and municipalities
			Participation of civil society
			Help low income and vulnerable people

The pre- and post-interviews with teachers, representatives of associations of municipalities and other local stakeholders revealed two more barriers:

- The lack of university-industry-society collaboration was often named as one of the main causes of a mismatch between supply and demand of capacity building activities;
- The underdeveloped lifelong learning system in WBC leads to discontinuity and, in-long run, inefficiency of the training activities.

Finally, the interviews with teachers and trainees as well as observations during the courses revealed that majority of trainers and trainees did not consider themselves as change agents and were pessimistic about their ability to change the system of training and the system of energy planning respectively. This could be partly explained by hierarchical mode of decision-making and strategic planning; weak local self-governance; and prevailing short-term thinking in WBC.

4 Discussion and conclusion

This study highlights challenges of capacity building in sustainable urban energy planning and development in WBC and addresses needs and barriers in training of municipal staff in the region. The study concludes that the international cooperation has a good potential to improve quality of capacity building and to catalyse university-society collaboration in WBC; however, to reach these effects, the international experiences should be adapted to local needs and constraints. Saying this, the adaptation

to local conditions does not mean uncritical application of teaching practices prevailing in WBC. On the contrary, the knowledge transfer through training of trainers should include modern problem-based teaching methods to deliver the high quality of stakeholder training. For instance, the best learning outcomes within the SDTRAIN project were observed during a participatory backcasting course in Nis, which can be partly explained by an extensive learning-by-doing process and the highest level of motivation among both trainers and trainees due to the real-life nature of the problem addressed within the course; as well as by multidisciplinary mode of the course.

Finally, analysis of the pre- and post-project interviews with the local trainers and trainees and the project's unexpected spin-offs (e.g. collaboration agreements between universities and associations of municipalities; the letter of commitment by the Mayor of Nis to use outcomes of the SDTRAIN project in the strategic development of the city's heating system; a new backcasting project initiated by trained staff of a local University in municipality of Ivanjica (Western Serbia), etc.) showed that despite the identified barriers, the training courses allowed: a) acquiring contextualized knowledge and practice-oriented skills; b) developing strong network of stakeholders capable to facilitate sustainable infrastructure development; and c) advancing research agenda at the local universities through their linkage with societal actors and orientation towards solving societal challenges. However, the SDTRAIN project bears the risk of becoming a one-time experiment if establishing the lifelong learning system in WBC would not get political and financial support from the national governments.

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