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ENVIRONMENTAL CONCERNS OF ENERGY CHAIN AS A REFLECTION OF SUSTAINABILITY

Abstract: *Environmental policy integration (EPI) relates to the inclusion of environmental concerns in sectoral policies outside the conventional environmental policy domain. EPI has became a main concept in global environmental governance with the intention to link the incompatible objectives of economic competitiveness, social development and environmental protection with the concept of Sustainable Development (SD). Having to deal with the environmental concerns over, for example energy, is a necessity. There is an opinion that the environmental concerns of the energy chain are some of the most important drivers to influence European Union (EU) energy policy. Similarly, Renewable Energy Sources (RES) and energy efficiency created the stance for a sustainable energy system. The target for energy from RES (RES-E) in the gross final consumption in the Republic of Serbia is set to increase from 20.1% in 2014 to 27% in 2020. Each deviation from mandatory share of RES in gross final consumption in the Republic of Serbia would mean higher energy gross consumption than anticipated and more capacities for energy generation from RES. Analysis is required from the aspect of energy system possibilities, the impact on mandatory national goals for energy share from RES in total gross final energy consumption and long-term interest of the Republic of Serbia.*

Key words: Environmental policy integration, Sustainable Development, Renewable Energy Sources.

INTRODUCTION

Environmental policy integration (EPI) relates to the inclusion of environmental concerns in sectoral policies outside the conventional environmental policy domain [1]. EPI became a main concept in global environmental governance with the publication of the Brundtland Commission's report "Our Common Future" [2], intending to link the incompatible objectives of economic competitiveness, social development and environmental protection with the concept of "Sustainable Development" (SD). Having to deal with environmental concerns across, for example, energy, transport, industry, housing and agriculture and associated actors with differing priorities and interests is necessity, as the institutional specialization of policies for specific sectors has results in insufficient consideration of environmental impacts [3].

The sectoral policies have objectives in conflict with environmental objectives and are able to influence root causes of environmental pressure [1]. For instance, there is a stance that the environmental concerns of the energy chain are some of the most important drivers to influence European Union (EU) energy policy [see 4, 5, 6]. There is, however, a lack of understanding how the relationship between these policies has influenced and changed energy policy. Moreover, little is known about what factors motivate or prevent the incorporation of environmental concerns in sectoral policies and how to stimulate EPI in specific situations [1].

The settlement of the "Cardiff Process" in 1998 stands for a step forward to the practical application of EPI. As follows, Renewable Energy Sources (RES) and energy efficiency created the stance for a sustainable energy system [7]. The 2009 Climate and Energy Package is the flagship instrument of the EU's forward-looking perspective on the sustainable energy model (Oberthür and Pallaemarts, 2010). The Package represents a set of binding legislation to ensure that EU meets climate and energy targets for the year 2020: (1) 20% cut in greenhouse gas emissions (from 1990 levels); (2) 20% of energy from renewable; and (3) 20% improvement in energy efficiency. It comprises four main measures: (1) a revision of the Emissions Trading System (EU ETS); (2) an "Effort Sharing Decision" governing emissions from sectors not covered by the EU ETS (e.g. energy, transport, industry, housing and agriculture); (3) binding national targets for RES; and (4) a legal framework to promote the development and safe use of carbon capture and storage.

The Renewable Energy Directive (RES-E Directive) adopted in 2009 establishes an overall policy for the production and promotion of energy from renewable sources (RES-E) in the EU. On the basis of initial point and overall potential for production of RES-E, it

specifies national renewable energy targets for each country. EU countries are required to illustrate how they plan to meet these targets and the general course of their renewable energy (RE) policy in National Renewable Action Plans (NRAPs). To make sure that each member state adapts the Europe 2020 strategy to its specific situation, the European Commission (EC) advises that EU objectives should be translated into national targets and trajectories.

THE ANALYSIS OF ENERGY CIRCUMSTANCES IN THE REGION

The Energy Community

The Treaty establishing the Energy Community (TEnC) was signed in Athens, Greece, on 25 October, 2005. The Energy Community is an international organization established between the EU and the third countries to extend the EU internal energy market to Southeast Europe and beyond. The contracting parties commit themselves to implement the relevant EU energy acquis communautaire, to develop an adequate regulatory framework and to liberalize their energy markets in accordance with the acquis as specified by the Treaty.

The energy strategy of the Energy Community is based on the same principles as it is the EU energy strategy: it sets priorities and targets for the energy sector and the actions that need to be taken in order to achieve them. Therefore, members of Energy Community face the same challenges in the energy sector that the members of the EU states face: creating energy market with competitive prices, ensuring security of supply of energy, reducing CO_2 emissions and energy savings. The strategy integrates national energy priorities in a regional context, highlighting investment opportunities based on co-operation between the countries and the integration of the regional electricity market.

The key measure of the (TEnC) is the implementation of EU targets under the 2009 Climate and Energy Package by the contracting parties to the Treaty (Table 1).

Table 1. Energy Community targets for renewable energy (RE) by 2020

Contracting parties	Share of RES in energy consumption, 2009.	Targeted share of RES in energy consumption, 2020.
Albania	31,2%	38%
Bosnia and Herzegovina	34%	40%
Croatia	12,6%	20%
Macedonia	21,9%	28%
Moldavia	11,9%	17%
Montenegro	26,3%	33%
Serbia	21,2%	27%
Ukraine	5,5%	11%
Kosovo	11%	18,9%

The Energy Sector of the Republic of Serbia

The energy policy of the Republic of Serbia is a prerogative of the Ministry of Mining and Energy of the Republic of Serbia, created in 2016. The National Energy Agency (AERS) of the Republic of Serbia, founded in 2006, regulates the energy sector. Its task is comprised of implementing the mechanisms necessary for the good performance of the energy markets (tariffs, market access, network interconnections, etc.). Structure of electricity generation, consumption, import and export balance (GWH) in the Republic of Serbia is presented in the Table 2.

Table 2. Structure of electricity generation, consumption, import and export balance (GWH)

	2012	2013	2014	2015	2016
Electricity generation	38,103	38,600	36,799	39,877	34,060
Conventional thermal	67%	76%	73%	73%	65%
Nuclear	0%	0%	0%	0%	0%
Hydro	32%	23%	26%	26%	34%
Other renewable	1%	1%	1%	1%	1%
Imports	5,620	6,701	5,781	4,077	7,008
Exports	-5,917	-6,979	-5,392	-6,614	-5,445
Electricity consumption	37,806	38,322	37,188	37,340	35,623

RES sector, except hydro energy, is in its early phase of development. Estimated RES potential, which is technically available in the Republic of Serbia, is presented in Table 3.

Table 3. Overview of technical usable potential of RES (from 2012)

RES type	Available technical potential in use (million toe/per year)	Unused available technical potential (million toe/per year)	Total available technical potential (million toe/ year)
Biomass	1,054	2,394	3,448
Hydro energy	0,909	0,770	1,679
Wind energy	≈0	0,103	0,103
Solar energy	≈0	0,240	0,240
Geothermal	≈0	0,1	0,180
Total	1,968	3,682	5,650

Performed within energy sector of the Republic of Serbia are exploitation of domestic primary energy (coal, oil, natural gas, RES), import of primary energy (mainly oil and natural gas), electricity and heat energy generation, exploitation and secondary processing of the coal, and electricity transmission and distribution to end users of final energy.

The most important priorities of energy sector development in the Republic of Serbia are provision of energy security, energy market development and transition towards sustainable energy sector. Safe, reliable and quality energy supply is a prerequisite of economic and social development. Import energy dependency of the Republic of Serbia (24.5 % in 2014) compared to the majority of European countries is relatively low and is present in oil sector, petroleum products, and natural gas. Postponement in the construction of new electric power plants, anticipated reindustrialization and the increase of industry production have contributed to the Republic of Serbia becoming considerable importer of electricity in recent years. Creation and development of energy market based on the principles of competition, publicity and free initiative of energy entities, remains an underlying stance for SD of the energy sector. Internal regulatory framework, along with regional market liberalization, is intended to provide regional integration of national market.

The Republic of Serbia accepted, signed and ratified TEnC establishing regional energy market as one of its prerequisites for integration into energy market of the EU. Market functioning is based on the implementation of acquis communautaire of the EU within the context of energy policy, illustrating the extent and nature of the coordination and potential integration between security of supply, market development, energy usage and efficiency, and research and innovation. Development of national and regional market in the Republic of Serbia creates the possibilities for higher investing into sector and contributes the development of economy and country stability. It should also have a minimum impact on environment. Therefore, energy sector of the Republic of Serbia is intended to generate own development but also to represent the generator and safe basis for country development. Implication of energy efficiency measures, use of RES, environmental protection and reduction of impact on climate change are the most important elements of transition towards SD of energy sector in the Republic of Serbia.

Following the ratification of TEnC, the Republic of Serbia assumed obligations from Directive 2009/28/EC on the promotion of the use of RES-E and on promotion of use of biofuel or other fuels from RES for transport. According to the National Renewable Energy Action Plan (NREAP) of the Republic of Serbia, the target for RES-E in the gross final consumption in the Republic of Serbia is set to increase from 20.1% in 2014 to 27% in 2020. The target for biofuel or other fuel from RES-E in the transport is set to increase to 10% in 2020. The Republic of Serbia is expected to add approximately 1,092 MW of new renewable generation capacity by 2020. In order to achieve adopted national objectives, installation of larger capacities is advised for electricity generation by using RES (Diagram 1), representing also a targeted projection of RES use in final consumption.

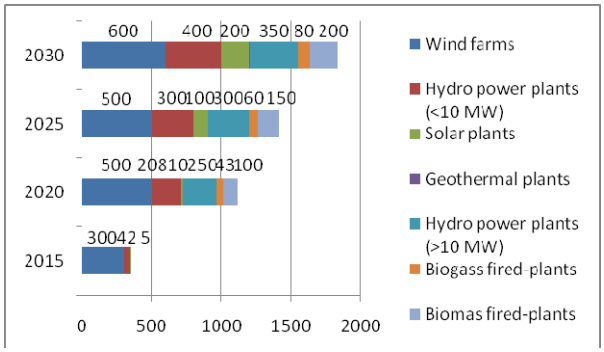

Diagram 1. *Projection of the construction of plants for electricity generation using RES*

The Republic of Serbia introduced the widely used model feed-in tariff (FIT) for subsidizing RES-E with the period of guaranteed supply of electricity of 12 years. The FIT are between 16.25 and €22.66c/kWh for solar energy, 7.80 and €9.70c/kWh for hydro energy (from small hydro power plants), €9.2c/kWh for wind energy, between 6.92 and €9.67c/kWh for geothermal energy, €8.57c/kWh for waste energy and €6.91c/kWh for landfill.

Each deviation from mandatory share of RES in gross final consumption in the Republic of Serbia would mean higher energy gross consumption than anticipated and more capacities for energy generation from RES. Considering that the participation of foreign partner is envisaged for several projects of construction of RES-E power plants, analysis is required from the stance of energy system possibilities, impact on mandatory national goals for energy share from RES in total gross final energy consumption and long-term interest of the Republic of Serbia.

Research questions

The aim of this study is to add to more effective EPI strategies by creating a framework on the governance of EPI based on empirical research organized around the following questions:

1. What strategies for stimulating EPI have been found?
2. What evidence is presented regarding the performance of EPI strategies?
3. How is the performance of EPI strategies explained?

METHODOLOGY

Research can be viewed as a process of finding solutions to a problem after a study and the analysis of the various factors. Similarly, business research can be seen as an organized and methodical effort to look at a specific problem faced in the work environment that necessitates a solution. It is thus defined as "organized, systematic, data-based, critical objective, specific inquiry or investigation into a specific problem, undertaken with the purpose of finding answers or solutions to it" [8]. Research is classified in accordance with the: (1) "purpose of the research (the reason why the research is conducted); (2) process of the research (the way in which the data were collected and analyzed); (3) logic of the research (the course of research from the broad to the specific or vice versa) and (4) outcome of research (the solution to a specific problem or a broad contribution to knowledge)" [9].

Present research is an exploratory research as there are no referential studies for the information about the issue. It will likely provide conclusive answers to the issue, and will give guidance on future research. Present research is a qualitative research. It is carried out to deal with the research issues and design a study that involves collecting qualitative data and analyzing them using the interpretative methods. Qualitative data collection instrument is a researcher itself. Qualitative data analysis includes the varieties of data analysis and possibilities for research. Also, present research is an applied research designed to apply its findings to solve a specific, the existing problem. It represents the application of existing knowledge to improve management practices and policies. Finally, present research is a deductive research in which a conceptual and theoretical structure is developed, which is then tested by empirical observation.

FINDINGS

It seems that the EU is on the right track to achieve the set goals. According to the available estimates, in the event of a reduction in greenhouse gas emissions, the EU will achieve 24% and will therefore exceed its 2020 target; in case of an increase in the final consumption of energy from RES, the EU is likely to reach 21% in this case as well to exceed its 2020 target. Finally, in relation to goals related to increasing energy efficiency, the assessments are that the EU will reach 17%, and therefore will not be able to achieve its goal. With only one year left by 2020, the EU has already set itself their 2030 targets that are even more ambitious and demanding than those for 2020. The goal to reduce greenhouse gas emissions for 2030 is at least 40% compared to 1990; a target of at least 27% for renewable energy is set; and for energy efficiency or energy savings, respectively, the target is also set to 27% in 2030.

On the other hand, the region of South East is seriously lagging behind, although the potential which is in implementation of acquis in relation to climate change and energy goals is extremely high. According to the Secretariat of Energy Community, there is the reason to assume that several contracting parties will not be able to fully achieve their goals by 2020, including Serbia. In fact, the Secretariat of the Energy Community had to initiate misdemeanor proceedings in the field of RES against several contracting parties which have not even submitted their NRAPs.

As for Serbia, in practice, there are very modest investment activities mainly in small hydropower plants (i.e. projects less than 10 MW), solar power plants and biogas power plants - with total capacity for all projects eligible for preferential redemption price (most of which are still under construction) in the amount of 5% of the planned 1.092 MW. There is a general (positive) remark that, behind Serbia, there is another successful year in terms of energy reform sector, and that the provisions of the new Law on Energy on issues of authorization and tenders for building new production capacities are in line with the acquis. On the other hand, it is evident that a small number of projects in this field have been developed or are under construction. It is noticed that Serbia is not on track to achieve its goals in terms of RES until 2020, as the impact of the regulatory framework on the actual development of this area during the previous years was minimal, and that since the adoption of Directive 2009/28/EC in 2012, only 23 MW of newly installed capacities from RES have been realized.

CONCLUSION

If we take into account that the whole region has only one more year to fulfill the mandatory goals for RES, there is a serious gap between the expectations and the reality. It is further obvious that the region, unlike the EU, has not yet begun to think about the goals for 2030. In other words, the significant potential of RES in Serbia and the region remains unused.

There is a number of reasons for this serious delay and the lack of investment activities in the sector of RES. They range from unnecessary regulatory barriers; infrastructure restrictions; inadequate resource estimates; complex legal, social and political environments due to which is extremely difficult to attract investments of this size; to the lack of regional cooperation, etc. What is certainly needed is to integrate the legal and political framework for the period until 2030, which would provide regulatory security for investors and a coordinated regional approach.

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BIOGRAPHY of the first author

Vlastimir Vucic was born in Skopje, Macedonia, in 1983. He received the BA in Business Administration with minor in Political Science from Anglo-American University in Prague, and MA in Business Administration from the DePaul University in Chicago. He is currently doing a doctorate in Business Administration at the United International Business School in Zurich.His main areas of research are: sustainable development, energy development, and renewable energy development. He worked as a project manager in Erste Bank in Prague and as an industry analyst in Erste Bank in Vienna. Presently, he works as a lecturer in United International Business School in Zurich.

ZAŠTITA ŽIVOTNE SREDINE ENERGETSKOG LANCA KAO REFLEKSIJA ODRŽIVOSTI

Vlastimir Vučić, Mirjana Radović Vučić

Rezime: *Integracija politike zaštite životne sredine (EPI) odnosi se na uključivanje pitanja zaštite životne sredine u sektorske politike izvan područja konvencionalne politike zaštite životne sredine. EPI je postao glavni koncept u globalnom upravljanju zaštite životne sredine s namerom povezivanja nespojivih ciljeva ekonomske konkurentnosti, društvenog razvoja i zaštite životne sredine s konceptom održivog razvoja (OR). Nužnost rešavanja ekoloških pitanja kroz, na primer energetiku, je neminovnost. Postoji mišljenje da su ekološka pitanja u energetskom lancu neka od najvažnijih pokretača uticaja na energetsku politiku Evropske Unije (EU). Na sličan način, obnovljivi izvori energije (OIE) i energetska efikasnost su stvorili osnovu za održivi energetski sistem. Cilj za energiju iz OIE (OIE-E) u bruto potrošnji u Republici Srbiji će se povećati sa 20,1% u 2014. na 27% u 2020. godini. Svako odstupanje od obaveznog dela OIE u bruto finalnoj potrošnji u Republici Srbija bi značila veću bruto finalnoj potrošnju energije od očekivane i više kapaciteta za proizvodnju energije iz OIE. Potrebna je analiza sa stanovišta mogućnosti energetskog sistema, uticaja na obavezne nacionalne ciljeve za deo energije iz OIE u ukupnoj bruto finalnoj potrošnji energije i dugoročnog interesa Republike Srbije.*

Ključne reči: Integracija politike zaštite životne sredine, održivog razvoja, obnovljivi izvori energije.