

RENEWABLE ENERGY ZONES (REZs) AS A STRATEGIC ALTERNATIVE WITH ENVIRONMENTAL AND ECONOMIC ASPECTS OF SUSTAINABILITY. THE CASE OF BALKANS

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Abstract. Renewable energy zones (REZs) have recently been very popular in USA in 2009. The Balkan countries could similarly integrate their individual objectives for the mutual exploit of benefits in renewable energy. Environmental and economic cooperation among the Balkan countries would be attained by REZs in the aspect of continuous energy needs. Energy dependencies for foreign resources, gaps and shortages which are very familiar to the Balkan economies and possible local surplus of the REZs were supposed to be balanced in between the Balkan countries: large national energy zones (NEZs) in the area. Therefore, a synergy would be attained among the REZs in the Balkans. The need of political and diplomatic motivation could be achieved by the suggested Balkan renewable energy charter (BREC). Legal framework would be parallel to the European Union Renewable Energy Directives and Kyoto Protocol seeking environmental value which would be added by REZs. In the study, techniques to provide the development of REZs and the barriers were discussed after a suggested roadmap stating the development phases of the strategic alternative in order to attain independency and sustainability in energy and increased environmental protection for the Balkans.

Keywords: renewable energy, renewable energy zones (REZs), the Balkans, sustainability.

AIMS AND BACKGROUND

Renewable energy is generated from natural resources that can be naturally replenished as in liquid biofuel, solid biomass, biogas, geothermal, hydroelectricity, solar, photovoltaic, tidal, wave, and wind energies. Among many strategies used worldwide, policy-makers have not been able to successfully cope with secure supply and environment-health issues due to the lack of coherent energy strategies¹.

As an alternative, renewable energy zones (REZs) are the local concentration areas where most of all energy is gathered from renewable energy resources. The energy of REZs is not only consumed in the zone but also transmitted into other regions of the country and in a broader range internationally.

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REZ has been a very popular concept in USA: the states of Utah, Iowa, Nevada, Nebraska, Hawaii, Maine and Washington introduced legislation for establishing REZs which will ensure a more efficient use of resources through production and transmission in 2009. For that aim, the states will identify geographic areas that are rich for renewable energy resources and establish, designate and create REZs for which special incentive plans and programs are developed to encourage investments and projects sensitive to environmental protection. Studying and examining REZs will result in a green energy zone for one state and in wind energy development for another state depending on the potential of the region².

The US policies include a range of tax incentives, bond authority, training for green jobs, directives on the use of federal funds, grants, loans, comprehensive energy policies, net metering, and updates to renewable portfolio standards with others on transmission and distribution. For most of those states legislation is currently pending and will carry over in 2010 hopefully promoting REZs in other states and leading toward an energy independency and sustainability in the US (Ref. 3).

In most of the Balkan countries the legal framework on energy policies should be parallel to the European Union Renewable Energy Directives and Kyoto Protocol seeking environmental value. For renewable energy performance and policies in order to determine a sustainable renewable energy development, REZs provide an opportunity in the Balkan Peninsula.

EXPERIMENTAL

The study employs multi-source qualitative reasoning and incorporates quantitative data of renewable energy in order to represent REZ concept to a Balkanised area of attempts. For the study a set both of printed and electronic material was examined and the findings were analysed empirically. The material consists of statistics and publications of international and national institutions and/or agencies, country profiles and energy policies in the Balkans. Relevant Balkan energy facts were revealed as averages and compared with world values. Through the hurdles and barriers to create effective REZs, the study suggests a strategic alternative roadmap for the attainable synergy.

RESULTS AND DISCUSSION

The Balkan countries have different policies to support the development of renewable energy and improvement of energy efficiency⁴.

Most of the attempts are quite local and mostly as private enterprises. Starting even by just one type of the renewable energy such as wind power-electricity, cooperation is always possible in a Balkanised area of attempts of generation and transmission. Thus, the Balkan countries could integrate their individual objectives

for the benefits of renewable energy together in order to get use of the synergy potential in between their attempts.

Reorganising those attempts in the context of competition nationally and co-operation through energy integration in the Balkans will develop environmental and economic sustainability.

Energy dependencies for foreign resources, gaps and shortages are seen in the Balkan economies and with possible local surplus of the REZs, those may be balanced in between: by integrating zones in the area as large national renewable energy zones (NREZs).

The Balkans is a potential geographical region both for renewable energy and its transmission. Therefore, sustainability concerns of renewable energy are given in Table 1 as a beginning point of policy-making for the Balkans^{5,6}.

The Balkan countries have close figures with respect to their economic conditions as given in Table 1. Balkan averages differing among countries with respect to world figures states that total primary energy supply (TPES) increases above world level in the Balkans. Thus, efficiency and the alternative resource seeking should continue, environmental protection issues are to be critical with higher CO₂ emissions and renewable energy generation should be promoted at least up to the world level.

Although many bilateral agreement and treaties ensures cross-border cooperation, the Kyoto and EU directives aid much into renewable energy development in the Balkans.

Transmission is the factor of vital importance for the renewable availability in a wide range. Therefore, a synergy could be attained among the transmission among REZs in the Balkans.

Portfolio policies would draw on strengths of diversification to attain strategic energy goals⁷.

By numeric targets increasing over time, renewable portfolio standards (RPS) may promote the approach by requiring a minimum amount of renewable energy is included in portfolios of each energy, i.e. electricity supplier⁸.

Techniques to provide the development of REZs in financial basis and capital generation may be led by using complex incentives to promote investments.

With the employment potential of new public investments breeze along the circumstances of global financial crisis, countries may reflect the public expenditure concentration on REZs and/or provide financial measures to facilitate private investments in the issue.

Countries with their own policies to develop renewable energy generation have different performances on the subject. The need of political and diplomatic motivation could be achieved by a suggested charter named the Balkan renewable energy charter (BREC) among the Balkan countries ensuring the development of renewable energy generation including the concept of REZs that will provide

sustainability for the energy bills of Balkan countries through much more efficient use of resources if any synergy could be created.

Table 1. Some energy related facts in the Balkans

Some energy related facts in the Balkans	Total primary energy supply (TPES)		CO ₂ emissions (from fuel combustion) ^b	Renewable energy (RE)
	TPES increase Mtoe ^(b-a)	TPES/GDP (toe/000 2000 \$) ^b	CO ₂ /population (t CO ₂ /capita) ^b	(RE/TPES) ^a % in TPES
Albania	-0.23 (2.17–2.40)	0.41	1.27	26.3
Bosnia Herzegovina	+ 0.90 (5.60–4.70)	0.78	4.77	14.7
Croatia	+ 0.52 (9.32–8.80)	0.36	4.96	11.1
FYR of Macedonia	+ 0.32 (3.02–2.70)	0.72	4.48	11.5
Serbia and Montenegro	-1.49 (15.81–17.30)	1.20	6.73	10.5
Bulgaria	+ 1.33 (20.23–18.90)	1.10	6.57	5.2
Romania	+ 0.31 (38.91–38.60)	0.70	4.27	12.0
Turkey	+ 18.11 (100.01–81.90)	0.27	3.59	13.2
Greece	+ 1.68 (32.18–30.50)	0.19	8.74	5.1
Moldova	-0.06 (03.34–03.40)	1.71	1.98	2.2
Slovenia	+ 0.13 (07.33–07.20)	0.27	7.89	11.5
Balkan average (%)	+ 1.96 (21.63–19.67)	0.70	5.02	11.2
World (%)	+ 970.4 (12029.0 ^b –11058.6 ^a)	0.30	4.38	13.1
	+ 8.77			

Sources: ^a Ref. 5; ^b Ref. 6; note that (b–a) stands for TPES of 2007–2004 and no qualified data could be obtained for Kosovo; note that *Mtoe* (million t of oil equivalent) where *t* of oil equivalent (or *toe*) refers to the amount of energy released after burning 1 ton of crude oil and 1 *toe* = 41.868 GJ (gigaJoule or 10⁹ Joules) by the IEA definition.

CONCLUSIONS

Stating the development of the strategic alternative, the suggested roadmap given in Fig. 1 introduces the phases of economic, political and environmental aspects from REZ to support sustainable renewable energy and raise environmental protection in the Balkans.

Phases	Objectives and/or actions
Phase I	determining the geography available for renewable energy generation
Phase II	defining REZs and structuring the space of new investments by incentives
Phase III	selecting REZs with outstanding performance
Phase IV	concentrating incentives on best REZs to promote capacity development
Phase V	defining NREZ as a total of phase IV REZs and establishing RPS
Phase VI	setting convenient political measures in the Balkans to cooperate on REZs
Phase VII	BREC with the accession of all Balkan countries with utmost motivation
Phase VIII	improvement in cooperation to balance the NREZs performances
Phase IX	substantial increase in renewable energy production in the Balkans
Phase X	giving priority to transmission issues to reduce gaps and surpluses
Phase XI	effective and efficient distribution of renewable energy in the Balkans
Phase XII	attained energy sustainability and independency in the Balkans
Phase XIII	increased environmental protection in the Southeastern Europe

Fig. 1. Roadmap for REZs in the Balkans

Nevertheless, the possible barriers could be: low political interest and enthusiasm, obstacles of defining REZs and evaluating their performances, possible extra investments on transmission grid most probably with an unaffordable budget requirement, unstable breakpoints of investments because of the changing incentives by time via unexpected circumstances, inconvenient costs and benefits of setting RPS to have NREZs and inconvenient transmission infrastructure.

While creating renewable infrastructure, environmental impact should not endanger the nature as an unwanted result, giving paradox for the sake of protecting environment by renewable energy investments.

Deserving a clarified bureaucracy, permit approval procedure of renewable energy investments may refer to some inconsistent criteria, application and review processes across the Balkan countries. Thus, cohesion and extra coordination would be required particularly on facilitating financial aspects of public and private enterprises such as ensuring credit collaterals.

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