

Marketing of renewable energy sources in the region

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European Union has a leading role in the world due to its strong commitment to increase renewable energy sources as for the energy system change. Success of such long term project requires first of all a stable political framework, well-tailored support system of finances, technical background and administrative, and by this way it can overcome the obstacles existing in distorted energy markets. Regardless their high potential, renewable energy resources are insufficiently exploited in Europe. The aim of the contribution is to bring characteristic of particular sources of energy and technologies of exploitation in the geographic area Hnilec valley. We obtained detailed summary of positive and negative aspects and the reason of further survey in this field. Overall result of the thesis is the complex of knowledge of possibility of exploitation of sustainable sources of the energy in the region Hnilec valley and determination of the best possible variant of it.

Key words: renewable energy sources, marketing analysis, region, mechanism supporting RES using

Introduction

Renewable energy sources saw mixed results in 2011. Global bio fuels production stagnated, rising by just 0,7 %, the weakest annual growth since 2000. Growth in the US (10,9 %) was slowed down and Brazilian output had the largest decline (-15,3 %) due to a poor sugar harvest. In contrast, renewable energy used in power generation grew by an above-average 17,7 %, driven by continued robust growth in wind energy (+25,8 %), which accounted for more than half of renewable power generation for the first time. The US and China once again accounted for the largest increments in wind generation. Solar power generation grew even more rapidly (+86,3 %), but from a smaller base. Renewable forms of energy accounted for 2,1 % of global energy consumption, up from 0,7 % in 2001. [14] As for the European Union, there is high potential of renewable energy sources (RES), but they are not sufficiently used. [12] Therefore European Union has a strong commitment to increase RES to at least 20 % in 2020 [5].

Experiences from various countries prove that without initial state support there is not possible to build base for applying of the Technologies, using renewable energy sources.

Renewable energy systems may contribute to sustainable development. Therefore, one of the challenges for energy policy is to ensure that renewable energy options have a fair opportunity to compete with other supply resources [9].

The renewable support mechanisms, such as renewable purchase obligation (RPO) and feed-in-tariff are incorporated so as to account the relative costs of cleaner and renewable generation technologies [16].

Support mechanisms of RES using

From the various support mechanism that are available for RES, it is possible to make difference between direct and indirect tools. Except of the regulation tools there are existing also so-called voluntary accesses of RES support and they are based mainly on the willingness of consumers to pay tariffs for so-called green energy. Decision if such political tools, orientated to the price regulation or volume and if they support investment or production, belong among the important classification criteria.

Direct political measurement has as a goal to support using of RES immediately, meanwhile indirect tools are orientated to the improvement of the long term conditions for RES using. Producers of renewable energy sources obtain according strategy, orientated to the price regulation, financial support by the way of donations. Main strategies, orientated to the price regulation, are as follows:

- Strategy, orientated to the investment – financial support is provided through investment donations or advantageous credits or tax relief (usually per production capacity unit).
- Strategy, based generationally – financial support is determined by feed-in tariff (FIT) or by fix bonus (in addition to the electric energy price), so governmental institutions, utilities or suppliers are obligatory to pay for renewable electricity from proper sources. [3]

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In the strategy, orientated to the volume regulation, quota defined by government presents demanded level of RES production or its conjunction to the market. Most important dimensions of such strategy present following systems:

- Selection procedure or offered systems: Appeal offers' submission to selection procedures begin by determination of commodity capacity. Economical competition among applicants lies in contract of victor that will achieve guaranteed tariffs for certain time period.
- Systems of tradable certificates: Such systems are known in Europe as so-called Green Certificates (TCG), systems Tradable in USA and Japan as standard renewable portfolios.

Except of the strategies that deal directly with support of one or various concrete Technologies for electricity production from RES, there exist also other strategies that can have indirect influence to the development of renewable energy sources. Most important of them are strategies as:

- Eco taxes on electricity produced with non-renewable sources; ecological taxes from electricity, produced by not renewable sources;
- Taxes/permits on CO₂ emissions; and taxes / concession to the CO₂ emissions and
- The removal of subsidies previously given to fossil and nuclear generation. removing of donations that had been provided by government mainly for atomic power.

For production of electricity from renewable energy sources there are two possibilities:

1. tax exemption, and
2. if there is no exemption for RES, taxes can be (partially or wholly) refunded.

Both measurements are used for existing, as well as for new producers with aim to increase competitiveness of renewable energy source. Both measures make RES more competitive in the market and are applicable for both established and new plants.[8] Indirect strategies in area of competences have also support by the way of placement of producers that use RES, as for example place planning and consequent single connection to the net and system of electricity suppliers. [11] In connection with economical support of renewable energy sources Slovakia uses possibility that is preferred also by EU Commission, called „fixed repurchase prices (feed – in tariff). Institute for regulation of net branches presents compete institution in area of fix repurchase prices calculation.

In present time renewable energy sources are not used in Slovakia equally and sufficiently, although many RES are greatly available and their real economical and energetic potential is significant. From the RES technical used potential in Slovakia greatest rate belong to water energy (55,3 %), consequently biomass (39,7 %), geothermal energy (4,9 %), solar energy (0,15 %) and wind energy (0,05 %). [1]

But as for traditional sources cannot be used anywhere, only where there is correspondent infrastructure, also renewable energy sources have certain geographical limits. It is obvious that significant influence to the effective using of renewable energy sources has country as a geographical unit, in which RES exists.

Knowledge of RES problem is described in detail in number of publication. Also potential for RES development in Slovakia as well as in the individual geographical units of Slovakia is known. But mainly due to the significant difference of the regions there is necessary to evaluate the regions individually. [4] Mainly knowledge about region characteristic is precious information for investors' decision to begin business in the given region as well as for public administration and for the individual inhabitants from the given area.

General characteristics of the chosen region

Region Hnilecká dolina that copies boundaries of Gelnica district, lies at the east part of Slovak republic, in north – west part of Košice county. It lies close to the districts Rožňava, Spišská Nová Ves, Košice – surroundings and Prešov. Expanse of this region is 584, 4 km² and the locality has preliminary range foothill or mountain character. [9]

Ores layers in this locality have been used in middle ages, interest steps of former mining can be found till present time by the way of abandoned shafts, heaps or sagging places.

Absolute altitude in the given locality reaches from 290 meters above sea level till 1322 meters above sea level that means hilly relief traverse to cleared area. Great heights differences are characteristic between ground of valley and peaks, mountain-ridges are slightly wavy.

According Atlas of Slovakia [1] this region is ranked as for the climatic condition to the C1 zone – slightly cool zone, and to M5 zone – slightly warm, wet zone with cold or cool winter (valley zone). Average annual temperature is 6, 8 °C. Number of summer days with temperature over 16 °C is less then 50, but number of freezing days with temperature lower then 0 °C is 86. Since whole region is opened in direction west – east, it enables in-leak of cool air from mountain, during cold annual period there are typical

temperature inversions with appearance of fogs in the valleys and clear weather at mountains. Due to the valley zone there are existing extreme temperatures of air 28 - 38 °C.

Searched locality belongs to the Black Sea flow area and river basin of Bodrog and Hornád. Locality is drainage mainly by the river Hornád and Hnilec (52,5 km in Gelnica district) that flows to water reservoir Ružín near Margecany. More important water inflows of river Hnilec are streams Smolník, Stará Voda, Perlov stream and Kojšov stream. As for the water reservoirs, Ružín has biggest importance and it lays in east part of Hnilec valley with water inflows of rivers Hornád and Hnilec. This water reservoir has important economical importance, since it serves as pumping water reservoir. Smaller artificial reservoirs exist at the cadastre of villages Jaklovce, Smolník, Úhorná and Gelnica. [15]

Region of Hnilec valley is characterized by rich biodiversity with preliminary forest togetherness, high ecological stability and number of extraordinary valuable localities – natural reservations (Kloptaň and peat moor Poľana), natural monuments (line Margecany and rocks in Závada) and also 2 big and 11 small localities are suggested for proclaiming as natural reservation (for example rocks in Folkmar and Kojšov, dish forest in Stará Voda, Talaby). Region of Hnilec valley is biggest forest locality in Slovakia (more than 74 %), spruce, dish and beech dominating in the forests. [5]

Except of high valuable localities part of the region (village Kluknava, Richnava, Hrišovce) belong to the most threatened areas of Slovakia due to the living environment – Middle Spiš area. Long term influence in this region is decreasing of acreage, mainly agricultural arable soil at the expense of forest soil. Its consequence is increasing of woodiness that is highest in the frame of Slovakia [4, 5].

Tab. 1. Acreage of soil in region of Hnilec valley.

EXpanse (Ha)						
Year	2003	2004	2005	2006	2007	2008
Agricultural soil:	11 582	11 568	11 561	11 554	11 527	11 476
from this arable soil	1 080	965	945	914	906	904
Not agricultural soil:	46 860	46 874	46 881	46 888	46 916	46 967
From this forest	43 724	43 729	43 731	43 731	43 760	43 808
Total space	58 442	58 442	58 442	58 443	58 443	58 443

Source: Regional statistics database 2010 [11].

Tradition with using of renewable energy sources is important factor in this region, when in the past as well as in the present time mainly biomass is using. Number of inhabitant, connected to the distribution of earth gas, resp. inhabitants that have such possibility, there is approximately 21 000 inhabitants, that presents 68 %. [11]

Marketing situation in the region Hnilecká dolina

In connection with problem solving in this locality there is necessary to analyze every area that can influence using of the individual RES. Knowledge from such analysis serve for defining of the best solution for RES using in micro region Hnilec valley.

Tab. 2 Analysis of needs and expectations of clients

	clients	needs	expectations
Households	Existed constructions	Decreasing of service cost for the energy, diversification of heating system, not demanded installation and reconstruction.	Cheap heating system that can be simply linked to the existed heating system and it can decrease service cost.
	New constructions	Low service costs, diversification of heating system, sufficient comfort.	Modern heating system with comfortable managing that is not demanded on maintenance and service. Standby source is simply launching in case of one source failure.
Firms / Organizations	Heat production	Securing of heat and warm service water for own service, or for further sale, rapid service.	Equipment that has shortest payback period of investments, sufficiency of raw material.
	Production of electric energy	Providing of electric energy for own service, or its sale to the public net, rapid service.	Equipment that has shortest payback period of investment, sufficiency of input raw material, possibly highest repurchase price of electric energy.

Source: own elaboration.

Result of STEEP analysis in the region Hnilec valley is that factors, which influence mostly possibility for RES using are low living standard, high woodiness, industry orientated to the elaboration of wood

material, state support of chosen RES, as well as technological environment. It is necessary to orientate to the economical support, marketing and change of the heater base for households and communities, investors obtaining for possible production of several components for RES using.

Potential clients are divided to two groups: households and firms (organizations). Every group is created by sub groups, every sub group has its own specific needs and expectations (tab. 2).

Potential for res using in region Hnilecká dolina

In Hnilec valley there are mostly used in present time energy obtained from biomass and energy from water flows, gradually solar energy and energy of environment starts to be used. From the analysis of the given region it results that RES using should be primarily orientated to the using of such sources that have big potential in this locality, as well as established tradition and that are economically convenient for the clients and that do not influence living environment significantly, rather vice versa, that bring possibilities for unemployment decreasing or support of local economy. [11]

From results of SWOT analysis of the individual energetic sources of the region there is obvious that most perspective RES with recommendation of using of offensive strategy are biomass, solar energy and energy of environment. Such RES have chance to be competitive in the given region with traditional source of energy.

Water and wind energy belongs in the region among energy sources that have potential, but not perspective. Using of such RES is possible only for production of electric energy and only in small volume as it is allowed due to the given geomorphologic and climatic conditions in the region. Geothermal energy has lowest potential for using of RES in Hnilec valley. Obtaining of such energy is costly due to the initial investment mainly during branding and verifying of proper locality by drilling work.

Following factors have most influence for evaluation of the individual RES sources (except of geographical and climatic conditions):

- Life cycle of equipment that uses individual RES source,
- Cost for service of this equipment,
- Technological seriousness of the mentioned source using, and its influence to the living environment,
- Repurchase price of electric and heat energy (in case of heat production for own consumption it means rate of produced and market price),
- Present market's rate in the given region.

Influences with highest weight for choice of concrete technology for elaboration of individual RES can be two key indexes, mainly total volume of market and market's rate. Annual growth's rate of market has significantly decisive rate on the evaluation of such technologies, as well as long term measure of profit and growth of rate on the market.

Economical and marketing evaluation of chosen renewable energy sources

Due to the evaluation of chosen RES there was applied multi factorial portfolio matrix, illustrated at fig. 1.

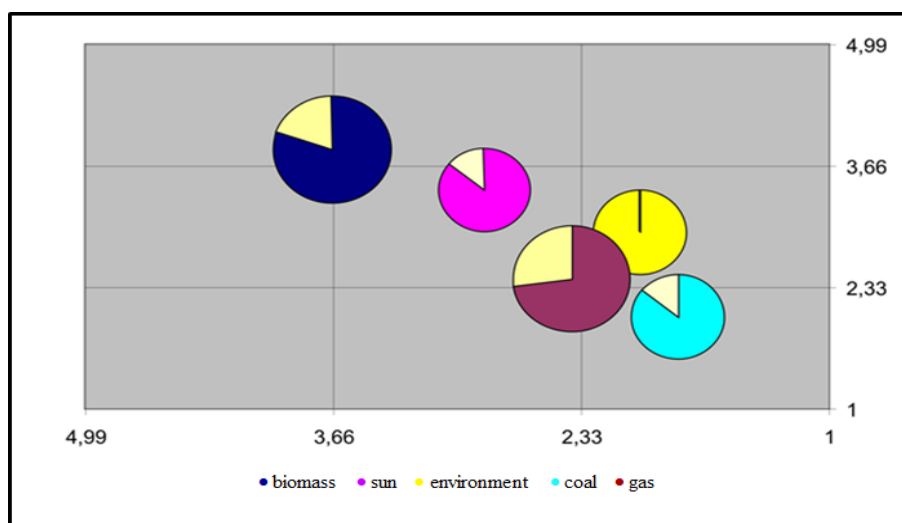


Fig. 1. Multi factorial portfolio matrix – heat production. Source: own elaboration.

Result of the matrix shows to the dominance of biomass that appears in the area of strategically convenient environment and that has also relatively great rate and market's rate. Development of heat energy from the Sun is limited and in this direction there is important to find possibilities for increasing of the source profitability. In the limited locality there is also heat energy from earth gas that is also dominant in this sector due to its great market and market's rate. Energy of environment and heat energy obtained from traditional source – coal, belong to the less proper zone in spite of relatively cheap price. Non-success of environment energy is also zero market's rate that is caused also by disinterest of state support, as well as by small propagation of this source.

Due to the proper evaluation of chosen RES there cannot be compared only cost for purchase and service of the technologies, but there are existing also number of data that influence most proper choice of the source and equipment for its using (Fig. 2).

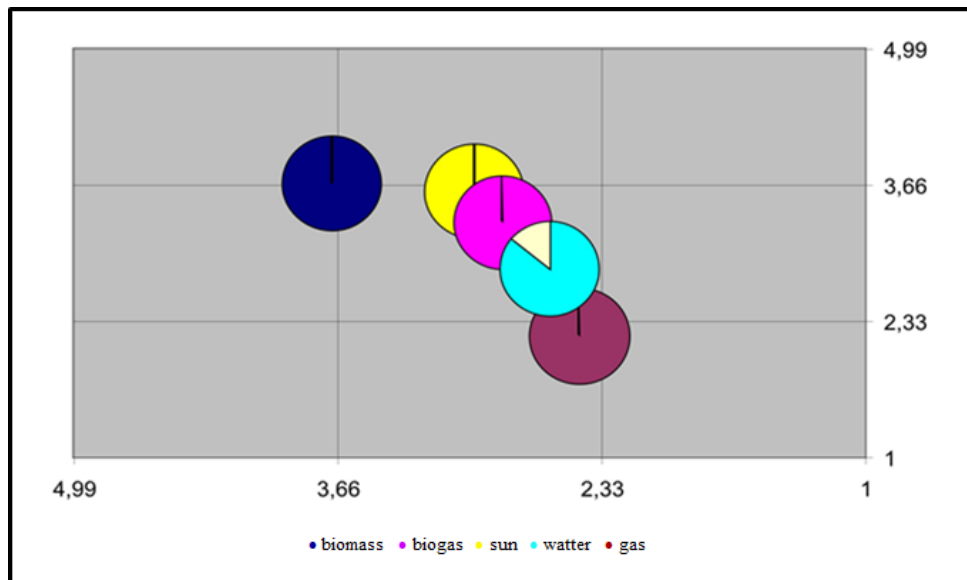


Fig. 2. Multi factorial portfolio matrix – production of electric energy. Source: own elaboration.

Dominance of biomass by direct burning is obvious from figure 2, which fitted in place as only one in the zone of strategically proper environment for investing and support to this RES. It is obvious that in spite of the zero market's rate this source has great potential. Possible business for production of electric energy from earth gas has been placed in zone with lowest proper position. It is obvious that development of this source is finished and it does not have importance for further investing in this region. In the centre there are three other potential sources. Electric energy obtained from water, in spite of market rate had already reached its potential and there is not expected its further development. Therefore it is less proper for possible business. Production of electric energy through barrier-layer photocells in the given region is limited by geographical and climatic conditions and its using is proper only for installation of insularities without possibility to connect to the public net. Although energetic source is still the same, production of electric energy with help of biogas electric plant is demanded as for the technology and material, but by good logistics and support of agriculture it presents interest source for further development, in which we assume great potential.

Conclusion

A marketing strategy targeting that is may gain momentum in the future is selling renewable energy as part of a product or service in an integrated product policy. Such integrated product policies currently take many environmental impacts of the product into account, but not the energy needed to produce the product, or to deliver the service. Summarising, the following marketing strategies will accelerate the market for renewable energy through voluntary markets:

- Create a strong brand combined with appealing communication that supports the positioning.
- Transparency and trustworthiness (e.g. through alliances with environmental organisations).
- A price premium that is not prohibitive.
- Assuring reliability and quality of service.
- Sell renewable electricity not as energy only, but as a service.

- Continuous innovation (for example in the field of convenience), which could help meeting the needs of the segments, where environment may not be sufficient argument.

Governments can influence the success of market driven approaches by creating a beneficial legislative and regulatory environment, or at least not prohibiting these market mechanisms to develop. Marketing can have an impact: not only on the quantity of the demand for renewable generating technology but also which technologies will prevail. To gain loyalty of the segments of their choice it is inevitable that retailers create strong brands. In the current situation origin and source are already ways that providers use to differentiate their product from other offers. This is more in anticipation of a more mature market on one side and on the other side incumbents try to reinforce their overall positioning. As the market is at the moment immature customers have to be won over for green power first. Segmentation of the current market would lead to niches in a niche market. Although the liberalisation of the energy market does offer opportunities for renewable energy, it may also create barriers if no specific measures are taken. Liberalisation will lead to less certainty for electricity prices- investments with higher risk and lower predictability of production may be considered less attractive. Therefore it is necessary to make a distinction between the regular electricity market and the market for green electricity. This green electricity market may also be liberalised in order to introduce the advantages of liberalisation in the green electricity market.

Another effect of ongoing liberalisation and privatisation processes in the electricity sector is that marketing is gaining in importance. Many companies selling (renewable) energy do not have much experience with marketing strategies and do not have sufficient capacity in this field. In order to reach both the retail and wholesale market, branding and marketing must receive increased attention. One possible marketing strategy is to sell renewable electricity not as energy only, but as a service. The current sales of electricity from renewable energy sources through voluntary markets still depend heavily on additional financial support. Voluntary markets for electricity from renewable sources are expected to gain momentum as the renewable energy sector develops into a mature market.

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