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RES-E SUPPORT POLICIES IN THE BALTIC STATES: DEVELOPMENT ASPECT (PART I)

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Despite quite similar conditions (natural resources) for electricity production from renewable energy sources (RES-E) in three Baltic States (Estonia, Latvia and Lithuania), significant differences exist in these countries as to the RES-E production volume. In Latvia this volume is the highest, while in Estonia and Lithuania it is half as high. One of the factors that determine the RES-E production volumes is support policies, which in the Baltic States are different. The main objective of this work was to analyze and compare these support policies. The results have shown that for rapid RES-E development the most effective policy is to be market-oriented (as in Estonia), whereas for more stable development such policy should be producer-oriented (as in Lithuania).

Keywords: *renewable energy sources, electricity, promotional scheme, feed-in tariff, feed-in premium, subsidies, effectiveness*.

1. INTRODUCTION

Increased electricity production from renewable energy sources (RES-E) is recognized as a measure which could reduce greenhouse gas (GHG) emissions, promote security of energy supply as well as technological development and innovations [1]. This would also be helpful in achievement of such economic goals as increased employment and economic growth [2] and in keeping the competitive prices [1].

Having estimated the potential benefits of renewable energy sector development, the European Parliament and the Council issued the Directive 2009/28/EC on the promotion of the use of energy from renewable energy sources (RES). Besides of other actions that are to be done in this area, Directive determines the national overall targets for the shares of renewable energy in the gross final consumption of energy. To realize these targets, the Baltic States set their sectorial goals. In particular, Lithuania took the obligation to increase the share of electricity from renewables up to 21% by 2020 (as compared with 4% in 2005) [3]. The target for Estonia is to achieve 4.8% RES-E share by 2020, which means increase by 3.5 percentage points [4]. In turn, Latvia – owing to its high hydro energy potential – has set one of the most ambitious sectorial goals among the EU countries, namely, to increase the RES-E share up to 59.8% by 2020 (as compared with 44.9% in 2005) [5].

In compliance with the 2009/28/EC Directive, the Member States should promote the RES sector development by applying several measures, including support schemes. These are understood as "*... any instrument, scheme, or mechanism applied by a Member State or a group of Member States that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased. This includes, but is not restricted to, investment aid, tax exemptions or reductions, tax refunds, renewable energy obligation support schemes including those using green certificates, and direct price support schemes including feed-in tariffs and premium payments*" [1].

This paper is reviewing the support schemes for promotion of renewable electricity in the Baltic States and assesses their effectiveness. Section 2 is dedicated to the analysis of RES-E support schemes in the countries by showing their advantages and disadvantages. Section 3 presents comparison of the support levels for different RES-E types. Effectiveness of RES-E support schemes is discussed in Section 4. It is expected that due to the increased effectiveness of support schemes, positive (desirable) economic changes will arise in the Baltic States (the relevant analysis is given in the ensuing paper).

2. RENEWABLE ENERGY POLICIES AND MEASURES FOR THE DEVELOPMENT OF RES-E SECTOR IN THE BALTIC STATES

The Baltic States' policies for development of energy sectors aim at achieving increased RES consumption and production. A package of strategies, laws and regulations has already been prepared for development of renewable energy sectors in the Baltic States. Almost all measures that have been implemented are RES-E generation-oriented. Here we also discuss other RES-E support policies and measures applied in the Baltic States from January, 2013 to March, 2014.

2.1. The Lithuanian case[1]

The National Energy Independence Strategy (NEIS) [6] implies that the RES-E sector is an indispensable part of the national economy and has to be developed seeking to achieve the energy independence goal until 2020. In compliance with this strategy, to implement the obligations taken under the Directive 2009/28/EC it is necessary to increase the RES-E share to 21% by 2020. Therefore, by this time 500 MW of wind power plants (WPPs), 355 MW of biomass PPs, 141 MW of hydro PPs and 10 MW of solar PPs are to be installed in the country.

The background for development of RES-E sector and the related aspects are described in the Law on Renewable Energy Sources [7]. The Law contains basic principles underlying the management, monitoring and control of this sector as well as its promotion, development and PP connection to the grid. The Law reads that the fixed tariff is the main RES-E support instrument. The currently existing fixed tariff support scheme is in-between the classical feed-in tariff and the feed-in premium. The peculiarity of a fixed tariff is that the RES-E generator is supported (subsidized)

[1]This section of the paper is prepared by using information which was published as a conference material (the 9th International Conference on Electrical and Control Technologies (ECT-2014), Kaunas (Lithuania), May 8-9, 2014, 104-109). The authors: V. Bobinaite and I. Konstantinaviciute.

through the difference between a fixed tariff and the price at which electricity is sold by the generator. This proves that the level of subsidy received by the generator is influenced by the market conditions, i.e. with increasing electricity market price the subsidy level decreases. A fixed tariff and promotional quotas to RES-E generators (with installed capacity ≥ 10 kW) are distributed at the auctions in Lithuania. The main idea of the auction is to create a competitive environment for a separate category of RES-E generators (e.g., separate auctions are organized for different types of RES (wind, solar, etc.) as well as for the RES-E PPs which are connected to transmission and distribution networks). After the National Control Commission for Energy and Prices (NCCEP) have published the maximum fixed tariff and promotional quotas for a separate category of RES-E generators, the generators compete for this tariff and promotional quota, and those offering the least fixed tariffs become winners. The maximum fixed tariff is differentiated in Lithuania depending on the type of RES, installed capacity and location of PP. With changes in the electricity market conditions and macroeconomic factors, the maximum fixed tariffs are being updated. It should be noted that since 2012 the fixed tariffs have decreased, and evident tariff reductions take place for the solar electricity.

The Law on Renewable Energy Sources [7] sets that in Lithuania the RES-E generators are not responsible for balancing as a public service. Thus, such balancing is paid by the final electricity consumers through the RES-E component included in the final price for electricity.

It is worth noting that the connection of RES-E PPs to electricity grid is also supported. The relevant cost is distributed between the RES-E generator and the operator of electricity grid. The RES-E generator pays:

- 40% of the cost of PP connection to electricity grid if the installed capacity of this PP exceeds 350 kW;
- 20% of the cost of PP connection to electricity grid if the installed capacity of this PP does not exceed 350 kW.

RES-E generators that do not participate in a fixed tariff support scheme could apply for the financing to be provided by the Lithuanian Environmental Investment Fund (EIF) [8]. During 2010-2011, 1.1 million EUR were distributed to wind and solar projects; however, due to economic recession, supply of investment subsidies to the RES-E sector was suspended.

The EIF implements the Climate Change Special Programme (CCSP) [8], which is funded through the financial resources received from selling emission allowances and from voluntary financial resources provided by legal and physical persons. Subsidies and soft loans are provided for the promotion of RES utilization and implementation of environment-friendly technologies.

The investment subsidies were provided from the EU Structural Funds for the period 2007–2013 [9]. In the framework of the Cohesion Promotion Action programme, the investment subsidies were received under the sub-measure "RES utilization for energy production". At the end of 2013, beneficiaries requested 196.9 million EUR for implementation of 120 projects, but financing was foreseen only for 58 projects (the EU support is 96.5 million EUR). Support was mainly provided to the biomass-related projects for electricity and heat production.

2.2. The Latvian case

In 2006, the Cabinet of Ministers adopted Regulations No. 571 on Guidelines for Energy Development during 2007-2016 [10] and No 835 on Guidelines for the Use of RES during 2006-2013 [11]. These policy planning documents set the relevant objectives and outline the energy sector's long-term development directions. The guidelines state that during a decade the security of energy supply and efficient use of energy from RES and co-generation process are to be increased. For this purpose, at least 700 MW of new capacities (including PPs using solid fuels) have to be introduced in Latvia. This will result in increased RES-E share in the national electricity consumption up to 49.3% in 2010, reaching the 100% self-sufficiency by 2016.

The Electricity Market Law [12] is recognized as a document which lays the basis for development of the RES-E sector in Latvia. The Law aims at creating conditions for a well-functioning electricity market, supplying consumers with electricity at reasonable prices, as well requires that a definite proportion of the Latvian final energy consumption is mandatorily covered by RES-E [12]. This law also foresees promotion of RES-E production and establishes promotional measures for this purpose. The Law says that the RES-E generators may receive the rights to sell electricity within the framework of mandatory procurement. The hydro PPs with a capacity of more than 5 MW are not included in the scheme. The generator producing electricity from biomass or biogas employing the installed capacity > 1 MW can gain the right to receive a guaranteed payment for the installed electrical capacity. The cost consisting of payments for the installed electrical capacity is covered by all Latvian electricity end users, proportionally to their electricity consumption.

So far, two regulations (No 262 and No 221) determine the development of RES-E in Latvia. They ensure the implementation of the feed-in tariff support scheme for RES-E, which will be valid until 1 January 2016 [13].

Regulation No 262 on Electricity Generation from RES and the Price Setting establishes the rules for acquisition of the right to sell RES-E by means of a mandatory procurement [14]. Based on this Regulation, a PP that has received the right to participate in RES-E selling also receives the right on a feed-in tariff. In other words, the wind, biomass, biogas, hydro and solar power plants are eligible to participate in the framework of a mandatory procurement and to receive feed-in tariffs. Calculation of these tariffs is based on the formulas which take into account the following fundamental factors: the end user's natural gas price, a coefficient depending on the type of RES used for electricity production and on the installed capacity. The feed-in tariffs are reduced by 40% after 10 years of PP operation. The RES-E technologies receive support for 20 years.

Regulation No. 221 on Generation of Electricity and Price Setting for Electricity from Cogeneration ensures a mandatory procurement of RES-E produced in the cogeneration process [15]. Tariffs and their structure are differentiated according to the installed capacity of a PP. If this capacity exceeds 4 MW_e and the PP participates within the framework of a mandatory procurement, such a PP is paid in two structural parts, i.e. the electricity component and the capacity component. The former means that the hourly electricity market price is paid (in EUR/MWh) for the generated electricity. In turn, the capacity component is differentiated under the

installed capacity criterion. The larger the PP, the less it receives for each installed MW per month. If the PP capacity is below 4 MW_e and combusts RES or peat, the feed-in tariff is paid for each MWh. In this case such tariff depends on the end user natural gas price and determined coefficients.

The main difference between Regulation No 262 and Regulation No 221 is that the former sets an annual mandatory procurement support volume for various types of RES for 2010 and the next 10 years, expressing this volume as a percentage share of the total final electricity consumption in Latvia (Table 1), while Regulation No 221 determines no quantitative restrictions on the purchase of RES-E in the co-generation process.

Table 1

Share of RES-E in the final electricity consumption in Latvia [14]

RES	**2010 and for next 10 years,** %
Hydropower plants (>5 MW_e)	34.31
Hydropower plants (<5 MW_e)	1.98
Wind power plants	5.37
Biogas power plants	7.93
Biomass power plants	4.97
Solar power plants	0.01
TOTAL	**54.57**

The method for setting the promotional quota in Latvia could have several segregated advantages. First, the promotional quota is expressed as a percentage share of the electricity consumed. Second, the promotional quota is set for RES-E generation volume but not for the installed capacity. Thus, in Latvia this quota is consumer-oriented. The benefit of such promotional quota is that with increasing electricity consumption a larger volume of RES-E is supported. The experience of different countries shows that more electricity is consumed when the country's economy is growing and the living conditions of society improves. Under the economic growth, the cost suffered by society due to subsidies (payments) to RES-E could be accepted easier. From this point of view, the method of promotional quota setting in Latvia is advanced as compared with that in Lithuania, where it is generator-oriented and aims at reducing uncertainties to investor regarding the electricity purchase volume.

In the support schemes several fiscal measures are applied. In compliance with the Law on Electricity Tax [16], the electricity supplied to the final consumer is taxable. The tax rate for electricity is set to 1.01 EUR/MWh. According to the law, electricity produced from RES by the hydropower plants or CHPs complying with the efficiency criteria are exempt from this tax.

The Law on Natural Resources Tax [17] sets that water used in hydropower plants is exempt from natural resources tax if the installed capacity of a PP is greater than 2 MW. The water rate of 0.00853 EUR/m^3 is applied if water resources are used in a PP the installed capacity of which is < 2 MW. This shows that this rate is not applied to major hydro PPs but is set for small-scale ones covered by a mandatory procurement framework. The law also sets that CO_2 tax is not charged on the incineration plants in which RES (wood and straw) and local peat are used as fuel.

In Latvia, the investment subsidy scheme is also available. The Ministry of Environment Protection and Regional Development has elaborated the Climate Change Financial Instruments (CCFI) using transferred revenues from the sales of GHG assigned amount units for environmental and energy efficiency measures, with the focus on climate benefits and switch from fossil fuels to RES [13]. Since the beginning of CCFI implementation 8 RES-E sector related measures have been prepared with the total funding of 41.88 million EUR [18]. The Ministry of Economy used financial resources from Cohesion Fund (CF) to implement the sub-measure "Utilization of RES in cogeneration power plants" [19]. Under this sub-measure, support was provided for the construction of 10 cogeneration plants. Support from EU has been 28.8 million EUR.

2.3. The Estonian case

The Estonian energy policy regarding the RES-E sector development is described in two strategically important documents (approved in 2009): the Development Plan of the Estonian Electricity Sector until 2018 and the National Development Plan of Energy Sector until 2020 [20]. These documents set the development directions for the Estonian electricity production sector. The general objective of the strategies is to significantly decrease the use of oil shale in the mentioned sector while to increase the production of energy from other energy sources (RES-E included) and thus to diversify the national energy mix.

So far, Electricity Market Act [21] is the main legal document that describes promotion of RES-E in Estonia. The act determines that the fixed premium tariff is the main RES-E support scheme in the country. This scheme will help to create new production capacities and hereby contribute to obligations taken by the country as to establishment of competition in the electricity production sector. Also, support to RES-E is required seeking to keep and increase Estonia's energy independence. The implementation of the fixed premium tariff scheme means that the RES-E generator sells its electricity in the free market and receives a fixed amount bonus on the top of the market price. The act sets that RES-E technologies are eligible to participate in the fixed premium tariff scheme, whereas eligibility of several technologies is subject to compliance with certain requirements. In the case of biomass, electricity is eligible for support if it is generated in high-efficient CHP plants. However, if electricity is generated by conventional thermal power stations, it is not eligible. The electricity produced for the PPs' own use is also not eligible for support. The fixed premium tariff is 5.37 EURct/kWh and does not differ among individual technologies, whereas the CHP plants with a production capacity below 10 MW and using waste, peat or oil-shale retorting gas are eligible for a tariff amounting to 3.2 EURct/kWh. Eligibility to the fixed premium tariff scheme is limited to a maximum of 12 years from the date of power plant's commissioning. The commissioning date of a PP or a system is the day in which it reaches 80% of its nominal capacity for the first time. The costs arising from the fixed premium tariff scheme are borne by the final electricity consumers, who are obliged to pay an additional renewable energy fee on top of their electricity bills and grid use charges. When setting the support level to RES-E, Estonian Competition Authority keeps the position that the rate of return received by the generator should not exceed 10%. In recent several years, discussions were held as to the necessity to change provisions of the support to RES-E. The main arguments for changing

them were the support costs to final electricity consumers and the country's good progress towards achievement of RES target. In 2013, the support to RES-E made up 0.87 EURct/kWh in the final price for electricity [22], which was 10% smaller than in 2012 [23]. In 2013, out of the total payments for RES-E, 43% went to wind electricity, 38% – to biomass-fuelled PPs with capacity over 20 MW, and 19% – to other sources, such as hydro energy, trash incineration and biogas [17].

According to K. Kallas [24], this RES-E support scheme is not without shortcomings. Many RES-E producers actually do not receive support, although the electricity produced by them is included in calculating the fee payable by consumers. The main reason is non-compliance of the equipment producing electricity with regulations. The Electricity Market Act sets that support to RES-E cannot be paid if the production equipment does not comply with the network requirements. In other words, a fee is being collected from consumers but not paid to the RES-E producer.

Investment subsidies are also available in Estonia [25]. Table 2 provides information about the available support for RES sector development. Such support (in the form of investment subsidies) is consistent with the "Estonian Electricity Sector Development Plan until 2018" and is given to the reconstruction of RES-based CHP plants and wind PPs by Estonian Environmental Investment Centre.

Table 2

Investment subsidies for RES-E production in Estonia [25]

Description	RES-based CHP plants	Wind PPs
Funder	EU Regional Development Funds and State funds	EU Regional Development Funds and State funds
Eligible technologies	Construction and renovation of RES CHP plants, reconstruction of boiler-houses for using RES	Construction of wind PPs
Amount	32000 - 3.5 million EUR depending on the action supported	3.2-20 million EUR depending on the scope of the project
Distribution costs	Support is coming from the European Union Structural Funds	Support is coming from Green Investment Scheme through the sales of the Assigned Amount Units.

Thus, the review of RES-E suport schemes shows that different schemes of the type were implemented in the Baltic States in 2013. The fixed tariff scheme was applied in Lithuania and Latvia, whereas the premium tariff scheme – in Estonia. The former scheme was dissimilar in Lithuania and Latvia in a way that the fixed tariffs in Lithuania were different for the same category of generators since these tariffs were set at the auction, and the wind electricity had already been traded in the market. The feed-in tariff in Latvia was the same for all generators falling within the same category of supported generators.

3. LEVELS OF SUPPORT TO RES-E GENERATORS IN THE BALTIC STATES

In Fig. 1, the electricity market prices and revenues received by RES-E generators are shown. The relevant comparison allows identifying the support (subsidy) received by the RES-E generator.

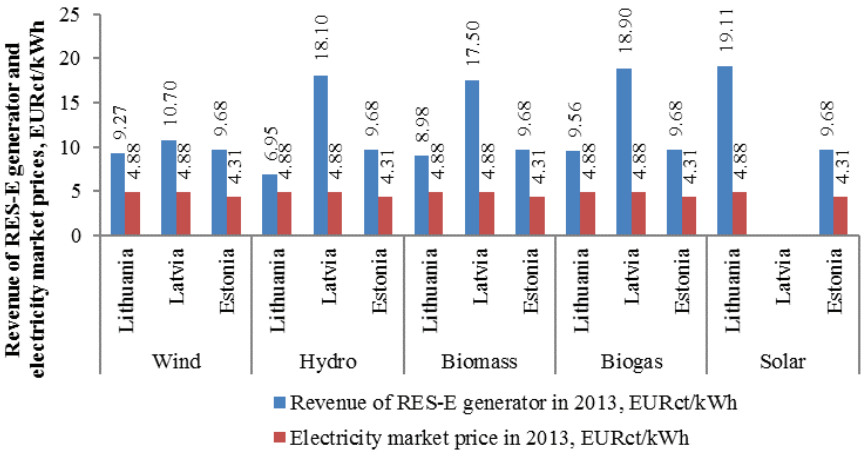

Fig. 1. Electricity market prices and revenues[2] received by RES-E generators in the Baltic States (2013).

As seen from Fig. 1, the highest revenue to RES-E generators is in Latvia. Especially high revenue was received by biogas, hydro and biomass electricity generators – 18.90 EURct/kWh, 18.10 EURct/kWh and 17.50 EURct/kWh, respectively. This revenue is similar to that received by solar electricity generators in Lithuania (19.11 EURct/kWh). Considering the average electricity market price, it could be stated that Latvia supports its hydro, biogas and biomass sectors the most among the Baltic States. The support (difference between the revenue and the electricity market price) was 13.22 EURct/kWh for hydro and 14.02 EURct/kWh for biogas generators in 2013 in Latvia, whereas Estonia's electricity end users supported all technologies at the same price of 5.37 EURct/kWh produced. The differences in support level for biogas electricity between the Baltic States exist owing to the RES type used for the production of electricity (sewage gas, landfill gas, manure and others), the electric capacity installed, the time of PP operation, etc. Support to the wind electricity is similar in the Baltic States. In 2013, the subsidy to wind electricity generators was 4.39 EURct/kWh in Lithuania, 5.37 EURct/kWh – in Estonia, and 5.82 EURct/kWh – in Latvia.

In 2013, support (subsidy) to RES-E made up 58.9 million EUR in Estonia, from which 43% was directed to the wind sector, 38% – to biomass, and 19% – to hydro and waste. In Lithuania, in 2013 support to production of RES-E and RES-E balancing service made up 53.35 million EUR. Totally in 2013, 104.3 million EUR were distributed among the RES-E generators in Latvia, with the following percentage: biogas – 51%, biomass – 27%, wind – 11%, and hydro – 10%.

The final electricity consumers pay the support (subsidy) provided to RES-E generators in the Baltic States. The RES-E sector regulating authorities in these countries have approved the level of subsidy for RES-E which is included in the final price for electricity paid by consumers. In 2013, subsidy to RES-E generator known as "RES-E components in the final price for electricity" was 0.59 EURct/kWh in Lithuania, 0.80 EURct/kWh in Latvia, and 0.87 EURct/kWh in Estonia (without VAT).

[2]Revenue means feed-in tariff (Latvia), fixed tariff (Lithuania) and electricity market price plus feed-in premium (Estonia).

4. EFECTIVENESS OF RES-E SUPPORT SCHEMES

Support provided to RES-E generators has an impact on the RES-E production volume (see Fig. 2).

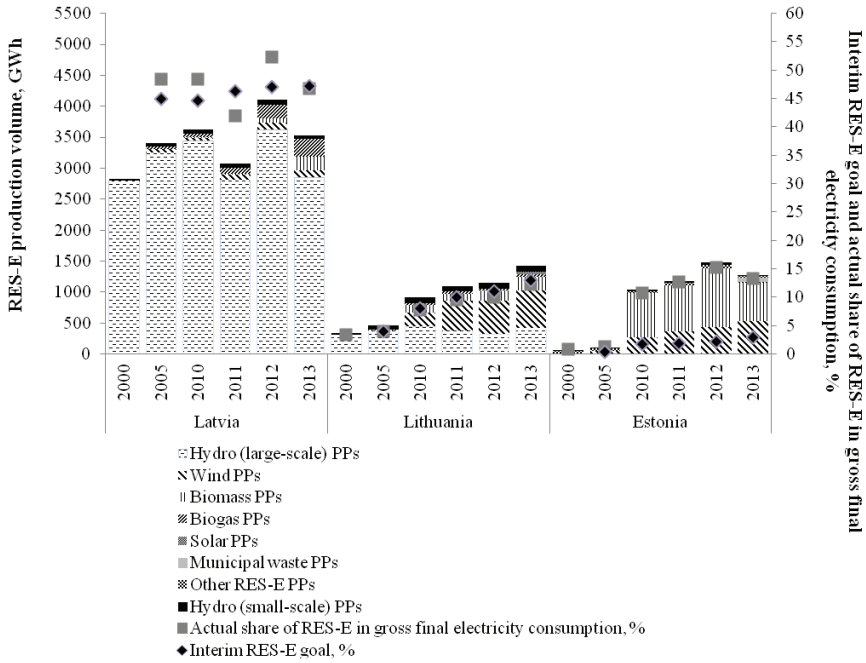

Fig. 2. Development of production volume of RES-E, interim RES-E goals and actual share of RES-E in gross final electricity consumption in the Baltic States in 2000-2013 [26-28; 3-5].

As seen from Fig. 2, before the implementation of the Directive 2009/28/EC on the promotion of the use of energy from renewable sources, the RES-E production volume was low in Estonia and Lithuania but high in Latvia, with the hydroelectricity dominating in the structure of RES-E. After the implementation of the Directive followed by provision of higher support, the RES-E sector started developing at faster rates, and various RES-E technologies entered the renewables sector. The data of the last several years demonstrate that in Latvia a better progress is achieved in the biogas and biomass sub-sectors (mainly because of the investment subsidies provided to biomass and biogas PPs), whereas the production of wind and biomass electricity is increasing at higher rates in Lithuania and Estonia. In 2013, the share of RES-E in the gross final electricity consumption made 46.7% in Latvia, 13.2% – in Estonia and 12.2% – in Lithuania. This means that the interim sectorial RES-E goals determined in the National Renewable Energy Actions Plans were overachieved only in Estonia (as shown in Fig. 2 by 10.3 percentage points), while the interim RES-E goals were not met in Lithuania and Latvia. However, Lithuania and Latvia failed to comply with these goals only at small rates. For example, in 2013 in Lithuania the

[3]RES-E target achievement rate was calculated as a differece between the actual share of RES-E in gross final electricity consumption in particular year and expected interim share of RES-E to meet the binding 2020 targets (as they are indicated in the National Renewable Energy Actions Plans).

share of RES-E in the gross final electricity consumption was only by 0.8 percentage points lower than the interim RES-E goal indicated in the National Renewable Energy Action Plan. Latvia failed to comply with the interim sectorial RES-E goal only by 0.5 percentage points in 2013, but overachieved it by 5.3 percentage points in 2012. This suggests that – historically – the countries were on the track to meet the interim sectorial RES-E goals, though, their success in meeting these goals in the future will depend on the economic development conditions, electricity intensities and other factors causing changes in the electricity consumption volume.

5. CONCLUSIONS

A package of strategies, laws and regulations has already been prepared and implemented to develop and promote RES-E sectors in the Baltic States. Thus, legally the RES-E sector is documented in these countries, but due to shortcomings of the RES-E promotional policy the support schemes should be elaborated in the Baltic States in such a way that they would become more transparent and stable non-discriminating RES-E technologies and their categories, with the effectiveness of support schemes increased.

Comparison of support levels to the RES-E generators in the Baltic States shows that – theoretically – the most rapid development of production volume of RES-E has to be in Latvia due to the highest support level (for hydro, biomass and biogas almost twice as high compared with Lithuania and Estonia). However, the most rapid development of production volume of RES-E is in Estonia, while in Lithuania – not so rapid but very stable development in the last four years.

Such a result can be explained by several causes, including the fact that the RES-E support policy in Latvia is based on the electricity consumption volume, i.e., support for RES-E is provided only for a definite percentage of this volume. This means that the producer of electricity cannot be sure that all the produced electricity will be supported. On the other hand, the Government cannot afford to support all RES-E generators because of the high support level (this will raise the price of electricity for final consumers); therefore, such a restriction is necessary in Latvia. At the same time, such restrictions hinder the RES-E development in this country. In turn, the RES-E (namely wind) support policy in Estonia is based on the electricity production volume, i.e., support for RES-E is provided only for a definite volume of electricity production (GWh); as concerns Lithuania, the support is based on the installed capacity, i.e., for RES-E it is provided only for a definite installed capacity (MW). This means that Latvia has the consumer-oriented RES-E support policy, Estonia – neutral (or market- oriented) and Lithuania – producer-oriented RES-E support policy.

This study shows that from the RES-E development aspect the most effective (for rapid development) RES-E policy is the market-oriented, while for more stable (and not very rapid) development this should be producer-oriented.

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REFERENCES

1. European Parliament & Council (2009). Directive 2009/28/EC on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. [Online]. Available: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=Oj:L:2009:140:0016:0062:en:PDF.
2. Ragwitz, M. *et al.* (2009). The impact of renewable energy policy on economic growth and employment in the European Union. Final report [Online]. Available: http://ec.europa.eu/energy/renewables/studies/doc/renewables/2009_employ_res_report.pdf.
3. National Renewable Energy Action Plan of Lithuania. [Online]. Available: // http://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans.
4. National Renewable Energy Action Plan of Estonia. [Online]. Available: // http://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans.
5. National Renewable Energy Action Plan of Latvia. [Online]. Available: // http://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans.
6. Parliament of Lithuania (2012). Lithuanian National Energy Independence Strategy. [Online]. Available: // http://www.enmin.lt/lt/uploads/energetines_nepriklausomybes_strategija.pdf.
7. Parliament of Lithuania (2011). Law on RES [Online]. Available: http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=453899&p_tr2=2.
8. Environmental Investment Fund (2014). [Online]. Available: // www.laaif.lt.
9. EU Structural funds 2007-2013. [Online]. Available: // http://www.esparama.lt/priemone?priem_id=000bdd538000119d.
10. Cabinet of Ministers (2006). Regulation No. 571 on Guidelines for Energy Development during 2007-2016. [Online]. Available: // http://likumi.lv/doc.php?id=141070.
11. Cabinet of Ministers (2006). Regulation No 835 on Guidelines for the Use of RES during 2006-2013. [Online]. Available: // http://likumi.lv/doc.php?id=146902.
12. Parliament of Latvia (2005a). Electricity Market Law. [Online]. Available: // http://likumi.lv/doc.php?id=108834.
13. Upatniece (2013). Sector RES-E Promotion in Latvia. Means of Support. [Online]. Available: // http://www.res-legal.eu/search-by-country/latvia/tools-list/c/latvia/s/res-e/t/promotion/sum/156/lpid/155/.
14. Cabinet of Ministers (2010). Regulation No 262 on Electricity Generation from RES and the Price Setting [Online]. Available: http:// likumi.lv/doc.php?id=207458.
15. Cabinet of Ministers (2009). Regulation No. 221 on Generation of Electricity and Price Setting for Electricity from Cogeneration [Online]. Available: http:// likumi.lv/doc.php?id=189260.
16. Parliament of Latvia (2006). Electricity Tax Law (in Latvian). [Online]. Available: // http://m.likumi.lv/doc.php?id=150692.
17. Parliament of Latvia (2005b). Law on Natural Resources Tax of 15 December 2005. [Online]. Available: http://likumi.lv/doc.php?id=124707.
18. Ministry of Environment Protection and Regional Development (2015). Klimata pārmaiņu finanšu instruments. [Online]. Available: // http://www.varam.gov.lv/lat/darbibas_veidi/KPFI/likumd
19. EU Structural funds during 2007-2014. Sub-measure "Utilization of RES in co-generation power plants". [Online]. Available: // http://www.esfondi.lv/activities.php?id=867&pid=0&action=projects&identifier=562b928d-443f-4ffe-867b-9a9c01194295.

20. National Development Plan of the Energy Sector until 2020 in Estonia (2009). [Online]. Available: // http://www.encharter.org/fileadmin/user_upload/Energy_policies_and_legislation/Estonia_2009_National_Development_Plan_of_the_Energy_Sector_to_2020_ENG.pdf.
21. Parliament of Estonia (2003). Electricity Market Act. [Online]. Available: // https://www.riigiteataja.ee/akt/ELTS.
22. Elering (2012). Renewable Energy Charge at 0.87 Cents per Kilowatt-Hour in 2013. [Online]. Available: http://elering.ee/renewable-energy-charge-at-087-cents-per-kilowatt-hour-in-2013/.
23. Elering (2014a). Taastuvenergia tasu elektri tarbijatele (Renewable Energy Charges). [Online]. Available: // http://elering.ee/taastuvenergia-tasu/.
24. Kallas, K. Why Is Renewable Energy Support Necessary? - Estonia. [Online]. Available: // http://www.hg.org/article.asp?id=20514.
25. Pilvik, R. (2014). RES-E Sector Promotion in Estonia. Means of Support. [Online]. Available: // http://176.9.160.135/search-by-country/estonia/summary/c/estonia/s/res-e/sum/124/lpid/123/.
26. Latvian Statistics (2014). Environment and Energy: Annual Statistical Data of Energy. [Online]. Available: // http://data.csb.gov.lv/pxweb/en/vide/vide__ikgad__energetika/?tablelist=true&rxid=a79839fe-11ba-4ecd-8cc3-4035692c5fc8.
27. Lithuanian Statistics (2014). Environment and Energy: Annual Statistical Data of Energy. [Online]. Available: // http://osp.stat.gov.lt/rodikliai56.
28. Estonian Statistics (2014). Annual Statistics of Energy Consumption and Production. [Online]. Available: // http://pub.stat.ee/px-web.2001/I_Databas/Economy/07Energy/02Energy_consumption_and_production/01Annual_statistics/01Annual_statistics.asp.

AER-E ATBALSTA POLITIKA BALTIJAS VALSTĪS: ATTĪSTĪBAS ASPEKTS (I. daļa)

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K o p s a v i l k u m s

Lai gan Baltijas valstīm (Igaunija, Latvija un Lietuva) ir samērā līdzīgi apstākļi (dabas resursi) elektroenerģijas ražošanai no atjaunojamiem energoresursiem (AER-E), tomēr šajās trīs valstīs ievērojami atšķiras AER-E saražotais elektroenerģijas apjoms. Latvijā ir vislielākais AER-E saražotais elektroenerģijas apjoms, bet Lietuvā un Igaunijā- divreiz mazāks nekā Latvijā. Viens no būtiskākajiem faktoriem, kas ietekmē AER-E ražošanas apjomu, ir AER-E atbalsta politika, kas Baltijas valstīs ir atšķirīgas. Raksta galvenais mērķis ir analizēt un salīdzināt AER-E atbalsta politikas Baltijas valstīs.

Iegūtie rezultāti rāda, ka straujai AER-E attīstībai visefektīvākā ir uz tirgu orientēta AER-E atbalsta politika (šāda politika ir Igaunijā), bet stabilākai izaugsmei- uz ražotāju orientēta AER-E atbalsta politika (šāda politika ir Lietuvā).

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