

## Policy and Strategy aspects for Renewable Energy Sources use in Latvia

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**Abstract:** Existing Policy & Strategy as well as new tendency in renewable energy sources (RES) use in Latvia will be presented in the paper. The main directions of the energy policy are aimed at improving the security of energy supply of the country by encouraging diversification of supplies of primary energy resources. Creation of competition conditions, promotion of use of renewable and local energy resources and environmental protection also play a substantial role.

In accordance with the Latvian “Law on the Energy Performance of Buildings” environmental and economic considerations, as well as binding regulations of the local government and other regulatory enactments, shall be taken into account in designing buildings, in order to evaluate the possibility to use as an alternative solution in these buildings systems, in which RES are used.

Paper will describe good experience and practice of this Policy and Strategy.

Papers will describe the geothermal energy and solar energy using opportunities in Latvian conditions. Recommendations for new legislation on RES effective and rational use will be presented.

The main directions of the energy policy are aimed at improving the security of energy supply of the country by encouraging diversification of supplies of primary energy resources. Creation of competition conditions, promotion of use of renewable and local energy resources and environmental protection also play a substantial role.

The main objectives of the energy policy are to ensure sustainable accessibility to necessary energy resources and security of supply in order to foster economic growth and improve quality of life; to ensure environmental quality retention and meet the objectives set in the Kyoto protocol of UN FCCC and Latvian Climate Change Program on GHG emissions reduction for years 2005 – 2010.

**Keywords:** policy, renewable energy sources

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### 1. Introduction

The main directions of the energy policy are aimed at improving the security of energy supply of the country by encouraging diversification of supplies of primary energy resources. Creation of competitive conditions, promotion of the use of renewable and local energy resources and environmental protection also play a substantial role.

The main objectives of the energy policy are to ensure sustainable accessibility to the necessary energy resources and security of supply in order to foster economic growth and improve quality of life; to ensure environmental quality retention and meet the objectives set in the Kyoto protocol of UN FCCC and Latvian Climate Change Program on GHG emissions reduction for years 2005 – 2010.

Latvia's total final energy consumption is secured from local energy resources and the flow of primary resources from Russia, the CIS countries, the Baltic countries, EU and other countries. Currently, three types of energy resource making up approximately equal proportions dominate in the delivery of Latvia's primary resources – oil products (mainly petrol and diesel), natural gas and wood-fuel. Like many other European Union (hereinafter – EU) countries, Latvia is dependent on imports of primary resources. Having regard to the reduction of economic activity in Latvia, although consumption fell during 2008.

The share of RES has traditionally been significant in Latvia's energy supply and in 2008 it comprised 29.9% of the total final energy consumption. Rapid growth in final energy consumption and the slow development of RES projects has reduced the RES proportion by 2.6% compared with 2005. In the consumption structure for electricity, the RES segment is made up of hydropower plants, wind power plants, biogas power plants and biomass power plants, as well as cogeneration stations utilising RES. In 2008, RES made up 39.6% of the total final consumption of electricity, with the majority of this, a little over 97%, supplied by large hydropower plants, with the remainder coming from wind power plants, biomass cogeneration power plants and small hydropower plants. RES makes up the largest proportion in the final consumption of heat energy, including district heating, at 42.7%. [6]

The import of fossil energy resources is characterised by large price fluctuations, which does not facilitate the sustainable development of the economy. Latvia's natural gas is supplied by only one country – Russia – Latvia, having regard to the potential of RES available in its territory and the significant position RES already takes in Latvia's current primary energy resource balance compared with other European Union Member States, must attain national energy independence both through promoting measures to increase energy efficiency and increasing the share of local RES in energy, diversifying energy resources and energy supply sources and reducing energy imports. [6]

## **2. Policy and Strategy for the RES use**

### **2.1. Energy policy framework documents:**

#### *2.1.1. Guidelines for Energy Sector Development for 2007-2016*

The main bases for Energy policy are: The guidelines to ensure security of supply in the country as the main goal of energy Policy. The increasing of self-sufficiency and greater diversification of energy resources supply are the next very important subjects of Energy sector development. Latvia has to search for its own fossil fuels and to increase effective use of renewable sources of energy and energy production in cogeneration (CHP) processes;

#### *2.1.2. Guidelines for Use of Renewable Sources of Energy for 2006-2013*

Setting targets for the use of RES are:

- 49.3 % share of RES-E by 2010;
- 8 % share of electricity produced in highly efficient CHP using biomass by 2016;
- 5.75 % share of biofuels in total consumption by 2010;
- 10 % share of biofuels by 2016 (in comparison to less than 2 % in 2006).
- 35 % share of RES in the Energy Balance (in comparison to 28 % in 2007).

### **2.2. Legal Framework**

#### *2.2.1. EU Directives:*

- Directive 2001/77/EC on electricity production from RES;
- Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market.
- Directive 2009/28/EC on the promotion of RES usage

#### *2.2.2. National laws:*

- Energy Law;
- RES Energy Law (project);
- Electricity market Law;

- Law on the Energy Performance of Buildings;
- Regulations No. 262 on Production of Electricity from Renewable Sources of Energy;
- Regulations No. 221 on Electricity Production in Cogeneration Regime.

## 2.3. Main support instruments

### 2.3.1. Mandatory procurement of electricity produced from RES on basis of fixed purchase price formulas

- Regulations No. 262 on Production of Electricity from RES (in force since March 2010); These Regulations (No. 262) indicated criteria's of produced electricity as compulsory purchase trades. If electricity produced of biomass or biogas in power station with installed capacity over 1 MW, it is possible to get guaranteed fee of set up power.
- Regulations No. 221 on Production of Electricity in Cogeneration Regime (in force since March 2009).

### 2.3.2. EU Structural Funds

In accordance with the Latvian “*Law on the Energy Performance of Buildings*” environmental and economic considerations, as well as binding regulations of the local government and other regulatory enactments, shall be taken into account in designing buildings, in order to evaluate the possibility to use as an alternative solution in these buildings systems, in which RES are used.

### 2.3.3. Investments in the energy sector

State support in the energy sector is only given to Projects linked to adjustment of heat supply system. The priorities for the use of EU Structural Funds are listed in the Development Plan; these priorities are sub-divided into measures, which in turn are sub-divided into activities. It is planned to allocate approximately EUR 140 million in the energy sector from the Cohesion Fund in the next Structural Funds utilization period of 2007-2013. This amount will be distributed to measures for increase of efficiency of district heating systems, for development of cogeneration plants that use biomass and development of wind farms in Latvia.

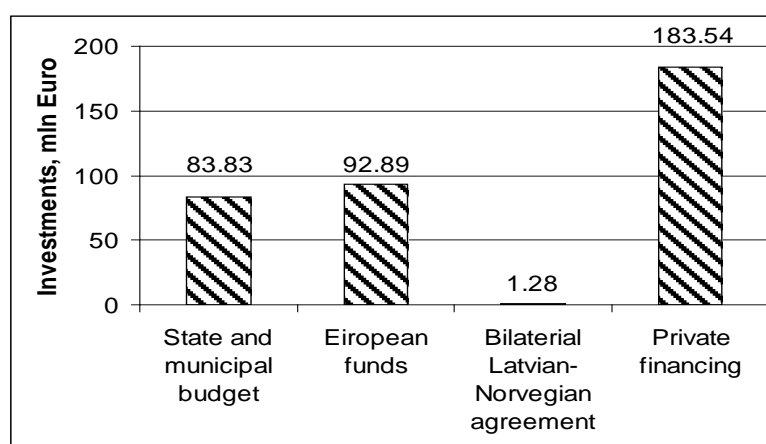


Fig. 1. Potential financial sources for development of RES use (2006-2013)

### 2.3.4. A feed-in tariff (FiT)

A feed-in tariff involves the obligation on the part of a utility to purchase electricity generated by renewable energy producers in its service area at a tariff determined by public authorities and guaranteed for a specific period of time (generally 20 years). A FiT's value represents the

full price per kWh received by an independent producer of renewable energy, i.e. including a premium above or additional to the market price, but excluding tax rebates or other production subsidies paid by the government.

Different tariffs can be defined for different technologies (wind, solar, biomass, etc.) or different countries depending on resource conditions (e.g. solar irradiation). The rate of a FiT is furthermore reduced each year for new installations in order to stimulate decrease in production costs. Feed-in laws have been the primary mechanism used to support RES development in Europe and the US. They have a track record of some two decades and are well established throughout the European Union. At present, they are being applied in 21 EU member countries. While many countries in Europe have introduced a FiT on different levels, only some of them (e.g. Germany) have adopted appropriate rates specifically for PV. Others used inadequate FiT parameters (for instance Austria – too low a ceiling on total installed PV capacity) and thus failed to stimulate significant investor interest.

The feed-in tariff (the mandatory procurement of the energy produced from renewables), a method of support Latvia has chosen, is a straightforward and effective way to reach the renewable targets. This approach is widely used in other member states, too. However, it also bears a number of risks, namely: the procurement price and support timeline is tied to the moment when the energy production equipment becomes operational; and the pricing formula relies on electricity prices and fossil fuel prices. A thorough and unbiased analysis of conditions needs to be carried out as well as a calculation of reasonable return on assets. The pace and direction of technological progress needs to be estimated, a hard task. Misjudgements in setting the procurement price and the length of support could go both ways. Truly effective, market-based mechanisms are yet to be found. In Latvia, a quick analysis of the procurement price for the energy produced from biogas or in established hydro-electric power plants reveals overestimates. The quota system favours a closed circle of businesses, whose ties to the political parties are apparent. No wonder the Ruling Coalition Council had to agree on the pricing principles and quota volumes before the decision was made by the Cabinet of Ministers. Unreasonable procurement pricing undermines the principles of renewable energy use for sustainable development. [7]

#### *2.3.5. Other support mechanisms*

In EU countries exist significant variety of support mechanisms. Their main goal is to introduce renewable energy sources into the market and to make them as a common source for gaining electricity. It is commonly admitted that activity of scientific circles and informational campaigns connected with demonstration projects play an important role in the RES development. In case of photovoltaic FiT Tariff is the most important and most effective way in creating development in that branch provided that correct designing of FiT law is submitted.

Investment based support mainly depends on providing investment subsidies, tax credits, and bank loans with beneficial interest rates. Supports mentioned above are significant due to their impact on initial market development. Investment based support has importance in case of expensive technologies and currently it is used in many European countries.

Quota schemes (also called Renewable Portfolio Standard - RPS) oblige the producers of electricity and retail provider to attain a specified minimum level of shares RES in its mix. RPS is commonly combined with the Tradable Green Certificates system (TGC). TGC relies

on market competition and therefore is unstable in the matter of price. These certificates being the subject of trade contain additional profit for the renewable user of energy. Tradable Green Certificates system does not favor the most future-orientated and ecological technologies of producing green electricity such as photovoltaic and off-shore wind turbine.

Tendering or Competitive Bidding is a transitional mechanism between FiT and RPS. Under a tendering scheme developer of project submits his own proposal and indicates the wholesale price he would like to get for the produced electricity. The one, who offers the lowest production costs of every kWh, will be able to sell electricity for the lower price and will enter a contract which guarantees that electricity will be bought over a defined period of time.

#### **2.4. New Energy Policy**

The first proposals are submitted to the Ministry of Economy of Latvia. Some recommendations for the new legislation on effective and rational use of the RES:

- there is a well-established national support scheme for production of electricity from RES – mandatory procurement applicable to electricity production in wind-, hydro-, biomass- and biogas PP;
- with regard to the RES, we convinced to reach a balance between electricity demand and supply potential from local Power Plants by years 2011 – 2012;
- to further develop and implement support schemes for highly efficient cogeneration and use of renewable energy resources in the power generation;
- to improve facilitation activities for bio-fuel production and consumption;
- to implement energy efficiency measures;
- to actively participate in EU and other international R&D projects;
- as a major challenge we regard the upcoming renewable energy policy development on the EU level and the ambitious individual target for Latvia – 42 % by 2020;
- to develop pilot projects and implementation.

##### **2.4.1. New Latvian Policy on RES**

Overall, the national renewable energy policy is to promote their use, respecting environment and achieving CO<sub>2</sub> emission reduction. The main renewable energy policy objectives to be achieved is as follows

- Electricity production of RES is 49,3% of all produced electricity in 2010;
- Renewable energy must be at least 37% in total energy balance;
- The share of biofuels of all marketed transport fuel should be 5,75% in 2010.

The aim of the Government policy is to achieve the balance between electricity demand and supply potential from Power Plants by years 2011-2012;

The goal is to promote maximum energy efficiency measures and supply of the power plants that use local fuels and renewable sources of energy in the high-efficiency co-generation cycle.

The remaining part of the required supply capacity will be diversified to other fossil fuels, to prevent over-dominance of natural gas.

During the development of cogeneration plants, energy from renewables will increase power capacity potential of transmission and distribution systems. Two support tools have been selected for this purpose:

- compulsory purchase at a specified price, whether in terms of all Latvian electricity consumer payment in proportion of consumption;

- Renewable sources of energy promote the development of cogeneration power plants earmarked for investment in the power structure, the purpose of EU structural funds.

For improvement of RES use and promotion of the development of biomass cogeneration, it is expected to attract the means of EU Structural Funds and support of Cohesion Fund. Till the year 2016 it is expected to attract 8,1 million LVL from the State Budget and 27 million LVL from EU Structural Funds.

RES exploitation strategy is closely connected with the introduction measures of energy efficiency. RES policy includes an integrated approach to energy efficiency issues.

#### 2.4.2. RES Law (project)

##### Aims and Objectives

##### *Aims of the Law:*

- to promote local RES production, use and export;
- to determine stable long term investment environment for production, usage and export of local RES support;
- to contribute reducing technologies of the greenhouse effect and gas emission;

##### *Law challenges to achieve goals:*

- Till the year 2020 increase the RES usage in gross final consumption up to 40% and continue to gradually increase it;
- to promote openness and accessibility of information on energy scope;
- to establish administrative procedures in RES production and usage;
- to determine the support measures for local RES production and usage.

#### 2.4.3. National goals of RES use

Law enforcement is a specific period till the year 2020 to achieve the following percentage of gross in RES usage:

- till year 2012 not less than 34,08%;
- till year 2014 not less than 34,82%;
- till year 2016 not less than 35,93%;
- till year 2018 not less than 37,04%;
- till year 2020 not less than 40%.

#### 2.4.4. Republic of Latvia National Renewable Energy Action Plan for implementing Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC by 2020.

The action plan 'Latvia's national renewable energy action plan' stipulates indicative targets for the share of RES in each type of final energy consumption, to foster the fulfillment of the common objective pursuant to Directive 2009/28/EC, taking into account the potential RES available and usable in Latvia. Having regard to the potential of economically usable RES available in Latvia, the main types of usable RES will continue to be solid biomass, mainly wood, as well as biogas, wind power and hydro power. [6]

## **2.6. North Vidzeme Biosphere Reserve as a good practical experience**

The administration of the North Vidzeme Biosphere Reserve (NVBR) has completed erection of the Environmental Education and Information Centre with a potential area of 675m<sup>2</sup> in the town of Salacgriva. This centre is expected to provide local residents, businesses, municipalities and state institutions with information about the natural assets of the reserve as well as about protection of natural resources and the use of innovative solutions in the regional development. By now, a project of the environment-friendly building in the Biosphere Reservation (BR) on the north of Latvia (Vidzeme) has been accomplished. The BR covers the area of Salacas River – a temperate forest zone characteristic of the Baltic Sea coastal ecosystems. Its land area is 4577km<sup>2</sup>, with the population of about 80 000 people. Half its area is covered by forests and 15% by wetlands. The reservation includes 167.5 km<sup>2</sup> of the Gulf of Riga coastal aquatorium. The Environmental Education and Information Centre building were completed in 2009. The relevant project was funded by the European Economic Area and Norwegian Government Financial Mechanism. The Centre will serve as a model for the use of environment-friendly renewable energy. According to the project, the heating-and-cooling equipment was installed for geothermal energy use and solar collectors – for preparing hot water. Energy savings through compression modular equipment were used in the reverse cycle heating of the building and solar collectors – for hot water production up to 90 MWh/ year. As a result, the following was achieved:

- CO<sub>2</sub> reduction (taking fossil fuel use as the basis) – 56.6 tonnes / year.
- Number of holes drilled for space heating and cooling – 11;
- Solar collector's area for production of 500 l hot water – 18 m<sup>2</sup>.

Such systems are highly efficient, therefore they were selected with the aim to reduce the management costs of Environmental, Education and Information Centre. Although there are some Backlogs, however system works and functions in full.

## **3. Conclusions**

Recommendations for RES effective use were prepared upon the realized projects and analyses of the National RES Policy and Strategy.

Within the frame of the State Research Program's Project "Research and development of the renewable energy resources production and consumption technologies for climate changes generated by energy sector mitigation" suggestions were worked up also for rational RES use.

The action plan provides for guidance towards the more extensive use of local RES in Latvia, noting the measures to be taken to attain the target prescribed in Directive 2009/28/EC, implementing sustainable development, conserving environmental quality and contributing to the reduction of greenhouse gas emissions, increasing Latvia's energy self-sufficiency, ensuring the sustainable utilisation of Latvia's natural resources and the socio-economic benefits of their utilisation. Support mechanisms for generating energy from RES that operate more successfully than previous ones must be established, not only for electricity but also for heating and transport fuel. [6]

The EU has stepped up efforts to harmonize policies on the promotion of the use of energy from renewables in all member states by defining legally binding policy principles for the renewable energy promotion measures and setting individual renewable energy targets for each of the countries. Despite that, Latvia's renewable energy support policy, particularly the mandatory procurement scheme for the energy produced in power plants using renewables, is an area with an unstable legal framework, susceptible to frequent fluctuations in political

opinions and interests, which often are not based in the country's economic and welfare considerations. The New RES Law is prepared to approval. The Law will improve the current situation of RES in total, as well as will prevent confusion.

In the recent years, Latvia's energy policy practice was marked by inconsistencies and the lack of socio-economic reasoning, which allows, in some cases, to suspect influence of lobbyists on the development of legal framework. Examples of that trend are the aforementioned frequent changes in the mandatory procurement regulation and the feed-in pricing formula, which is politically motivated rather than based in thorough economic reasoning. In the energy sector, is the lack of flexibility in the mandatory procurement scheme, which is meant to promote the use of renewable energy resources. The inflexibility may lead to situations when support schemes follow the letter of the EU directives, but not the spirit. The quota system supports the renewable energy target (49.3% ) on paper, but the structure of the system does not prevent the situation when the businesses with the procurement rights do not set up the planned renewable energy plants whilst the businesses that would be willing to do so have no access to the quotas.

The Environmental Education and Information Centre fulfilled its function as to promoting the state's comprehension of the importance of the RES use. Investments involved in the project were an economically viable option; besides, the realized project helps to reduce the yearly maintenance costs. As a result of the project it has become clear that the energy independence of Salacgrīva from imported energy resources is an invaluable and nationally important issue, which could be as a model to several European Union countries. The project also includes informational events that promote the advantages of using renewable energy for heating; this especially concerns heat pumps in combination with solar collectors.

As one more example of good experience, must be mention Institute of Physical Energetics (IPE). It is leader for solar energy research and development in Latvia. Achieved solar energy is used for IPE hot water supply. Solar energy polygon could be used not only as auxiliary heat supplier for IPE, but also as an education and training polygon for new specialists - students, PhD students, etc.

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