# DEVELOPMENT OF INSTITUTIONAL ENVIRONMENT TO PROMOTE THE USAGE OF RENEWABLE ENERGY RESOURCES IN LATVIA

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**Abstract**
The pattern of energy production and consumption changed rapidly during the last 15 years. The aim of the paper is to characterise the development of institutional environment in RES promotion within the last 15 years. The analysis reveals that attention to RES promotion in the nation was paid only before the accession to the EU. During the institutional environment creation and harmonizing with the EU institutional and legal system after the accession to the EU, the RES institutional environment became even more unstable and predictable. Formal targets are stated in planning documents, but the realisation of support schemes for RES changes each year since 2007. Thus, the increase of support amount does not result in an increase of RES proportion in the energy sector. The results of RES promotion will not be seen in the nearest future immediately, it takes time for Latvia's producers and farms to adapt and optimise technologies for active electricity and heat production from RES. The most stable support available in Latvia is accessible through EU funds.
**Keywords:** renewable resources, institutional continuity, EU support.

## Introduction

In economic theory, the concept of institutions is used most often in new institutional economics (Шаститко А.Е., 2002). The main idea of this concept is that during economic growth and rapid structural changes, the role of institutions increases. In many studies of international and national level on economic environment, key aspects are institutional performance, stability and their predictability. According to the terminology in new institutional economics, institutional environment is basic political, social and legal rules, which create a base for production, exchange and distribution. Institutional continuity and predictability of institutional changes are also very important. Researchers also draw attention to the existence of historically formed political and economic institutions and their resistance to the changes (Acemoglu and Robinson, 2006). In context of institutional economy, it should be noted that:

- Weak institutional regulation and its non-compliance with a legal system prohibits firms better performance;
- From the point of view of macroeconomic stability and political and legal system predictability, private sector is a greater winner than public sector when transparencies of institutional environment are at a low level.

The mentioned aspects often give background for unfair behaviour between competing firms. Such situations arise due to concentration of market (for example, monopoly or oligopoly in energy sector), a high proportion of state property and state controlled firms, as well as due to slow production factor mobility (land, estate).

Researcher also stated that resources have only a partial impact on growth processes, but they create initial conditions for emerging of institutions (Acemoglu et al., 2002). Fr. Fukujama (2006) believes that growth initiators are institutions which in many cases are exogenous regarding material resources used by society.

Despite strong political formal policy regarding renewable resource (RES) promotion in Latvia, there are several barriers. One of the most mentioned reasons is the relatively high cost of introducing RES technology. The second most often mentioned barrier is the institutional environment in RES promotion.

The aim of the paper is to characterise the development of institutional environment in RES promotion within the last 15 years. The tasks of the paper: 1) to discuss theoretical premises on the role of institutional environment; 2) to describe the formation of institutional environment at national level; 3) to summarise the impact of EU working policy on RES promotion in Latvia.

## Materials and Methods

The theoretical part of the paper is based on the interpretation of international researches (monographic method). The paper also contains materials from researches and publications in the renewable energy field which are produced in ESF researches "Attraction of Human Resources to Renewable Energy Resources", as well as statistical data. In the paper, the graphical method was also used.

## Results and Discussions

### *Institutional framework*

The most anticipated definition of institutions is based on D. North's formulation – institutions are rules in society, or more formally, constraints created by people, which influence cooperation (North D., 2003).

A similar definition is given by Nobel prise winner in economy E. Ostrom – institutions can be defined as norms, used to find out who has power to decide in every situation, which activities are allowed and which are not, what type of procedures will be prosecuted and what kind of benefits will individuals get (Nystrom K., 2008).

According to the neo-institutional economy paradigm, the autocracy, contracts, cooperation or even markets are solely organizational solutions to guarantee different types of responsibilities and rights. The very existence of the governance structures and their performance reveals how institutions work and influence economic activities. Thus, institutions create some sort of environment in which all types of human activities are located, including economic ones.

Main formal elements of institutions are rules. They create relationships between firms, thus reducing risks and simultaneously show potential profits or costs. However, the formation process of institutions is always based on asymmetry between involved parties. Asymmetries manifest as:

- unequal distribution of power;
- unequal distribution of wealth and resources;
- advantages in access to information flow;
- differences in priorities and individual norms.

Regarding RES promotion, the asymmetry reveals itself in special support. According to the EU – „"support scheme" means 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" (Direktīva 2009/28/EK). The author of this paper stated that regardless of this special support created by the EU, in Latvia the market of energy produced from RES suffers serious institutional problems, namely:

- asymmetry of information between potential producers and consumers;
- asymmetry of power between Latvenergo (monopoly) and local small scale producers in electricity generation;
- legal system in energy production and energy market 'quasi' compliance with the logic of energy policy at national level;
- capacity of state and local institutions in decision making about RES promotion is restricted by the lack of knowledge due to low investments in researches on economic, social and technological benefits of RES.

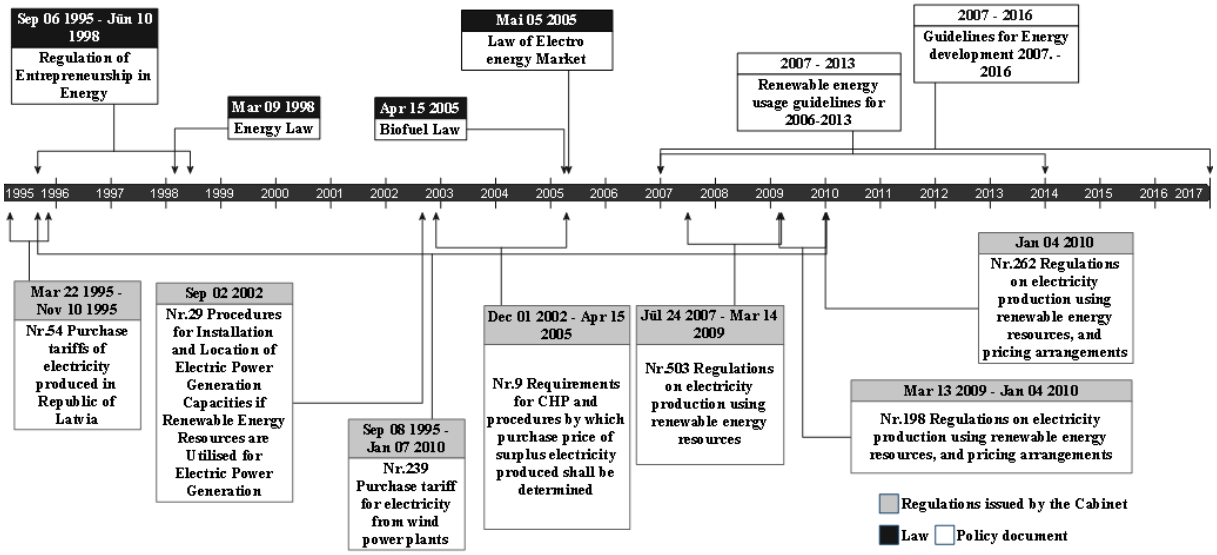
The first researches on RES usage in Latvia were done by energy sector specialists. Economic aspects of RES were not published by public research institutes till 2007. Increased attention toward RES promotion can be explained by at least two factors. First – the accession to the EU (2004) was possible also by a government promise to increase the proportion of RES and agreement with the common EU policy on RES promotion (regardless of the level of this proportion). Second – the national economy greatly improved till 2008. It should be noted that the hydro power plants had a favourable support system already since 1992 regardless of those events.

A national government determines not only the support system type and continuity, but also defines a normative system and procedures to follow. Traditionally the welfare economics approach does not analyse such outside market interventions (such as direct payments, taxies for fossil energy users etc.) because politics and economy are considered as two totally unrelated parts of human activities (Patrick M., 2008).

***National level***

The pattern of energy production and consumption changed rapidly during the last 15 years. Only five years after regaining indecency in 1990 through the process learning by doing, the first law regarding RES usage in energy sector come into force „Regulation of Entrepreneurship in Energy" (1995). Through the existing regulation at that time we can state that only two types of RES were acknowledged as considerable – hydro power plants (in Regulation No. 54) and wind (in Regulation No.239). A support amount for small and medium HPP (<5MW) was impressive – twice the average purchase tariff. This caused a building boom of HPP regardless of environmental problems which at that time had no regulation in the legal system. The need to reorganize the whole energy sector according to free market principles forced to issue the "Energy Law" in 1998. This law partially solved the problem of small HPP and their rather tiny impact in energy production (most of them were built solely for easy profit), defining the procedures and principles to support practically all RES types, including even geothermal (despite that no sufficient research data were available). The parliament, by issuing the "Energy Law", also delivered all power in RES support regulation to the Cabinet of Ministers, thus ending four year struggle for real legislative power in this field. All these events were accompanied by corruption scandals in high bureaucracy levels and uncertainty about energy policy development in the future.

From 1998 till 2005, the all RES support system was largely maintained and based on the Regulation of the Cabinet. Frequent changes in the "Energy law" regarding RES during this period and unpredictability in the Regulation (changed each year) prevented potential RES producers to invest. The Regulation of the Cabinet each year stated quotas for installation




*Source: Author's summarised data*

Figure 1. **History of basic regulations and laws regarding renewable resources usage in the energy sector in Latvia during the last 15 years**

of new electricity generation power and the purchase amount of electricity from these new power plants. Since the procedures and amount and price of quotas changed each year, energy producers appeared offering different purchase prices for the same type of resource. So, in 2004 there existed even four types of pricing, most often in hydro power usage. It should be noted that RES usage was promoted only in electricity. That period also can be characterised as politically unstable, the average ruling time of national government was one year.

In 2005 after the accession to the EU, the RES institutional environment become even more unstable. The "Law of Electricity Market" (2005) came into force and direction from the quota system was switched to the compulsory purchase system. In this year the "Biofuel Law" was also issued. At the moment, the "Law of Electric Energy Market" is a basic normative act at national level and regulations in RES support are issued largely based on this law. Two years after the acceptation of the "Law of Electricity Market", no institutional procedures and rules were created to specify the support. However, even after 2007, the real aim of these regulations and policies was not clear. EU political pressure to support RES usage in more extensive way finally forced the Cabinet, after three years, to define targets and instruments for RES in Latvia (see Fig. 1).

In 2006, the Ministry of Economics worked out the "Guidelines for Energy Development 2007-2013" and the Ministry of Environment worked out the "Renewable Energy Guidelines for 2006-2013". Mutual compliance of both guidelines is under question. In 2011, the new Energy policy is under revise and in 2012 we wait for a new integrated Energy policy document (LR EM, 2012, homepage).

Both planning documents defined targets and tasks for promoting RES usage increase, however, the main target is to achieve stable balance between energy demand and consumption during 2007-2016. In these institutional framework documents, basic tasks and potential instruments has been drawn, for example, to increase energy usage efficiency, to secure supply from local electric energy plants which use local and renewable resource with high electivity level cogeneration. The rest of energy demand should be covered with other fossil resources, thus reducing high dependence on natural gas. So, at national level, the main tasks are security and stability of energy supply as well as to cope with energy demand (Guidelines for Energy Development 2007-2013).

According to "Renewable Energy Guidelines for 2006-2013", the Cabinet also stated that the highest potential is in biomass and hydro resources, less attention is paid to wind energy usage and biogas production. The "Law of Electric Energy Market' (2005) and the "Biofuel Law" (2005) stated the targets of increase of proportion of RES in final consumption, however, the one unified strategy to achieve these target is absent (Dzene I., Marika R., 2008). Analysis of regulations issued after 2007 till 2011 shows that the Cabinet has not decided on a clear and predictable promotion system for increase of RES in final consumption. Based on these Guidelines, the "Biogas Production and Usage Development Program 2007-2011" was issued in 2006.

Regulation No.503 (2007) is practically the first national practical document because it defines the procedures and rules to get a compulsory purchase quote for renewable energy producers (see Fig.1). Despite many un-clarities and non-compliance with other regulations (till 2009), the first real stimulus

Table 1

**Compulsory purchase of electricity according to the Cabinet Regulation No. 262. „Regulations on Electricity Production Using Renewable Energy Resources and Pricing Arrangements" in 2011**

| Type of energy | Amount offered by public buyer, MWh | % of total | MWh | % of total | Compulsory purchase amount, MWh | % of total |
|---|---|---|---|---|---|---|
| Hydro (<5 MW) | 131 106 | 9.8 | 81 810.0 | 7.8 | 49 296.0 | 16.8 |
| | 100% | - | 62.4 | - | 37.6 | - |
| Wind (<0,25 MW) | 17 878 | 1.3 | 13 163,5 | 1.3 | 4 714.5 | 1.6 |
| | 100% | - | 73.6 | - | 26.4 | - |
| Wind (>0,25 MW) | 337 697 | 25.2 | 294 151.3 | 28.1 | 43 545.7 | 14.8 |
| | 100% | | 87.1 | | 12.9 | |
| Biogas | 525 085 | 39.2 | 471 102.7 | 45.0 | 53 982.7 | 18.4 |
| | 100% | - | 89.7 | - | 10.3 | - |
| Biomass and fossil | 329 089 | 24.5 | 187 149.7 | 17.9 | 141 939.3 | 48.4 |
| | 100% | - | 56.9 | - | 43.1 | - |
| Solar | 662 | 0.0 | 580.0 | 0.1 | 82.0 | 0,0 |
| | 100% | - | 87.6 | - | 12.4 | - |
| Total | 1 340 855 | 100 | 1 047 690.1 | 100 | 293 565.3 | 100 |

*Source: LR ME homepage (2011)*

for biogas and biomass usage promotion was created. Simultaneously regulations to support increase in biomass and biogas usage in cogeneration was issued. The inability of national government to decide on a more active promotion system has been shown by issuing Regulation No. 503. However, Regulation No. 198 "Regulations on Electricity Production Using Renewable Energy Resources and Pricing Arrangements" (2009) appeared thanks to increased knowledge of potential benefits of RES. This regulation cancelled connection between a purchase price of electricity from renewable energy resources and a natural gas market price. With this regulation, the RES system at national level has been clearly directed towards mixed schemes regarding the compulsory purchase and quota systems. In May of 2011, such mixed support has been cancelled for unknown reasons (Regulation No.262). Till the summer of 2011, it was possible to participate in a support scheme which contained:

- Rights to sell electricity in the compulsory purchase system (Regulation No.262, 2010);
- Right to get guaranteed support for electricity power installed in an electricity station (Regulation No. 262, 2010);
- Right to get guaranteed support for electricity power installed in a cogeneration station (Regulation No. 221, 2009);
- Rights to sell electric energy produced in cogeneration in the compulsory purchase system (regardless of resources used) (Regulation No.221, 2009);
- Participation in the quota system for biofuel (Regulation No. 280, 2008).

In addition to the mentioned mix of quota and purchase systems, other institutional instruments exist to promote and stimulate fossil resource change with renewable ones. The Ministry of Agriculture manages instruments of EU funds – supports biomass growing and biogas projects; the Ministry of Economics - electricity production from biomass and biogas, biofuel production (since 2007), but the Ministry of Environmental Protection and Regional Development – the Climate Control Instrument (since 2008). No instruments exist to promote renewable resources usage in heat production.

The data publicly available in the homepage of the Ministry of Economics (since the autumn of 2009) allow us to summarise practical results of the mentioned promotion schemes during 2009-2011 (see Table 1). Wind power stations (WPS) with a power of over 0.25 MW are the most actively newly registered (87.1% of all quota) plants, the second are biogas plants – 89.7% of all available quotas. A vertical analysis by comparing differences between resources reveals that the public seller (JSC Latvenergo) keeps little value sun energy and WPS with a power of less than 0.25 MW (available total amount of quota is around 1%). Biogas (39.2%) and WPS with a P>0.25 MW (25.2%) are considered as a potentially better solution.

Each year since 2007, JSC Latvenergo (a natural state-owned monopoly in electricity transmission and distribution in Latvia) calculates a needed amount from RES (with the main aim – to cover shortages in electricity and decrease the import proportion). The principles of quote creation are based on Latvia's RES targets in 2020. However, the proportion of RES type,

Table 2

**KPFI projects connected with RES promotion and their budgets**

| Title of project | Budget of the project (LVL) | Year of announcement |
|---|---|---|
| 1. Technology development in greenhouse emission reduction | 1 741 560 | 2010 |
| 2. Transition from fossil energy to renewable energy resources | 8 082 346 | 2010 |
| 3. Usage of renewable resources in transport | 3 522 621 | 2010 |
| 4. Usage of renewable resources in households (I part) | 4 432 721 | 2011 |
| 5. Usage of renewable resources in households (II part) | 7 218 785 | 2011 |
| 6. Usage of renewable resources in reducing GHG emissions | 27 716 876 | 2011 |
| 7. Development of technologies which reduce GHG emissions and realization of pilot projects | 2 793 646 | 2012 |

*Source: MEPRD homepage, 2011*

(wind, solar, biogas etc.) that has been stated each year by Latvenergo, is not publicly available. That caused the lack of quota for potential wind energy producers in March of 2009 because the available amount of quota has been distributed within three weeks. It should be also noted that many producers got the quota, having the electricity generation powers only on the paper, but the consumers already pay for that an increased electric energy tariff in which the RES proportion is also included (Public Utilities Commission home page, 2011).

Relatively newer state support is the „Climate Change Mitigation Programme for 2005-2010" (VARAM homepage, 2012). The Programme is based on the Kyoto Protocol to the Convention. Latvia signed the Protocol in 1998, and Saeima ratified it in 2002. The Programme is Latvia's state budget programme with the aim to mitigate climate change and to promote reduction of greenhouse emissions in Latvia. The primary goal of this programme – to ensure that starting with 2008, the total amount of GHG emissions does not exceed 92% of 1990 level. In this programme, there are also supported projects which involve using renewable energy resources. Real activities in this programme started only in 2008 when first agreements with partners were signed. However, a full report about projects and their results for the period 2008-2011 is not available yet (Report of Climate Mitigation Instrument in 2008, 2009). The latest available data are shown in Table 2.

The Program was not renewed after 2010, since it was clear that the Kyoto Protocol will be realized. The Ministry of Environmental Protection and Regional Development continues to work based on the accepted „Strategy for the Realisation the JI Projects under the UNFCCC Kyoto Protocol for the Time Period from 2002 to 2012". The total sum spend during this program so far is LVL 55 508 555, the most important project „Usage of Renewable Resources in Reducing GHG Emissions" was launched in 2011 with LVL 27 million.

Summarising the available data on support schemes on national level, the author has to agree with researchers' conclusion that they are fragmented and rather formal, since they have not essentially stimulated increase of renewable energy resources proportion in final consumption (E&IC, 2009). The legislation and support procedures has been changed very essentially within the last three years and even in the beginning of 2012 the policy is not clear about energy sector development and the role of renewable resources in it. This does not create a positive stimulus for potential investors in RES.

***Impact of EU support***

The EU working policy and legislation directed towards increase of electricity generation from RES and fossil fuel change to biofuel. The great push for doing that is the growing energy import dependency in all EU member states (EU Energy in Figures, 2010). The total amount of received subsidies during the last four years can be seen in Table 3.

Several measures are available for RES promotion:

- "Aid for Energy Crops" is a direct payment for areas in which energy crops are grown, which are utilised for the manufacture of energy products (2007-2010);
- Rural Development 3. axis sub-programme offers measurement „Energy Production from Agricultural and Forestry Biomass";
- "Production of Energy Resources from Agricultural and Forestry Products"

The aid for energy crops stopped in 2010, since this measure exceeded a limit of 2 million ha of agricultural areas in the EU. Latvia's farmers started to receive this payment from 2008 till 2010. An analysis of direct payments for growing energy crops shows that initially an average payment for it was lower, but later the number of farms stabilized. A regional analysis shows that most of such farms were located in Zemgale and Vidzeme. The total amount received in this measurement is LVL 1.88 million.

Table 3

**EU funds in renewable resources promotion in Latvia and State subsidies**

| Measure | Measures | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|
| Energy production from agricultural and forestry biomass | LVL | x | x | 4 788 177 | 5 883 317 |
| | Number of farms | x | x | 9 | 14 |
| Production of energy resources from agricultural and forestry products | LVL | 66 116 | 467 451 | 879 555 | 427 604 |
| | Number of farms | 4 | 10 | 15 | 7 |
| Aid for energy crops | LVL | x | 801 675 | 542 353 | 538 250 |
| | Number of farms | x | 430 | 168 | 170 |
| State subsidies – annual biofuel support | LVL | 4 938 179 | 3 946 161 | 6 872 771 | 4 310 482 |
| | Number of firms | 4 | 7 | 8 | 8 |

*Source: author's made summary based on Rural Support Service data (2011)*

Producers of energy resources from agricultural and forestry biomass received additional subsidies during the period 2007-2010 – in total LVL 1.84 million. However, the number of farms is rather small. We may conclude that this measure is received by a very short range of farms.

The biggest financial support in the EU Rural Development Fund is allocated to "Energy Production from Agricultural and Forestry Biomass" with a total amount of LVL 10.6 million. This support started only in 2009, but the number of farms is constantly increasing.

The highest support thanks to EU directives is received by private companies which produce biofuel. Within the period 2007-2010, firms received a special subsidy of LVL 20 million from the state budget. However, the increase of biofuel proportion in Latvia is not observed. So, in total, all firms and farms involved in biofuel, biomass, and biogas production received 34.3 million. The biggest part of this support is received in the last two years with many energy power installations in process.

There exist indirect supports since 2005 with issuing the "Biofuel Law" (2005) for biofuel with a lower excise duty and a compulsory proportion of biofuel in fossil fuel in 4.5-5% of final annual consumption. So formally Latvia has fulfilled institutional requirements regarding support for RES.

**Conclusions**

The pattern of energy production and consumption changed rapidly during last 15 years. Latvia historically has a relatively high proportion of RES in final electricity consumption.

From 1998 till 2005, practically the RES support system was largely created by several regulations of the Cabinet. However, increased attention to RES promotion at national level was paid only before the accession to the EU. During the institutional environment creation and harmonizing with the EU institutional and legal system after the accession to the EU RES, the institutional environment become even more unstable and predictable. Formal targets has been stated in planning documents, but the existing support schemes in Cabinet regulations for RES changed each year. The most basic rules of RES promotion are formed by regulations of the Cabinet (elaborated by the Ministry of Economics) since 1995.

Summarising the available data on support schemes on national level, the author has to agree that it is fragmented and rather formal, since they have not essentially stimulated the increase of renewable energy resources proportion in final consumption. The total amount of financial support through this support schemes is around 89 million during the period 2007-2011. No data are available on the effectiveness of compulsory purchase of electricity. Here, the role of the natural monopoly in RES promotion in Latvia has to be analysed more deeply.

The results of RES promotion will be not be seen in the nearest future immediately because it should take time for Latvia's producers and farms to adapt and optimise technologies for active electricity and heat production from RES in the exiting institutional environment. These farms and firms started to receive the real financial support only since 2008.

The most stable support available is accessible through EU funds in Latvia. RES support of the EU does not change so fast as that of Latvia.

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