Ministry of Economics
of the Republic of Latvia

Ministry of Environment of the Republic of Latvia

Progress report of the Republic of Latvia on achieving the national indicative targets pursuant to Article 3 Paragraph 3 of the European Parliament and of the Council Directive 2001/77/EC of 27 September 2001 on "The Promotion of Electricity Produced from Renewable Energy Sources in the Internal Electricity Market".

Riga
2005

Introduction

One of Latvia's main energy policy objectives is to reduce dependence on imported energy resources.

In general, the system of energy supply (primary resources, fuel, electricity) in Latvia can be assessed as balanced and fairly diversified. The supply system of primary energy resources in Latvia consists of 3 resources of which only one – the supply of natural gas – has a heightened risk level since it is possible to receive it only from one supplier. In terms of overall fuel supplies, the share of local fuel is about 46 % and in comparison with the first half of the 1990 ies the dependence of Latvia on external sources for fuel supply has decreased 1.6 times or on the average by 70 %.

Electricity in Latvia is supplied by the local electric power plants under Latvian jurisdiction, moreover, 40 % of electricity is produced from renewable energy resources. Imported electricity is supplied by three mutually independent and competing sources. Latvian electric power plants provide 70 % (including 50 % produced by local energy resources) of the required amount of electricity in the country, however, by 2008 this index has to reach 80-90 % of the total electricity consumption.

The Legislatory and Regulatory Framework

"Electricity Market Law"(2005) is the main law regulating the use of and support for renewable energy sources. The Law stipulates:

- Latvia's objectives with regard to electricity produced from RES as a proportion of total electricity consumption in 2010 in Latvia, i.e., 49.3 %.
- The rules for new electricity production capacities and the amplification of the existing capacities.
- Regulates the generation of electricity from renewable energy sources.

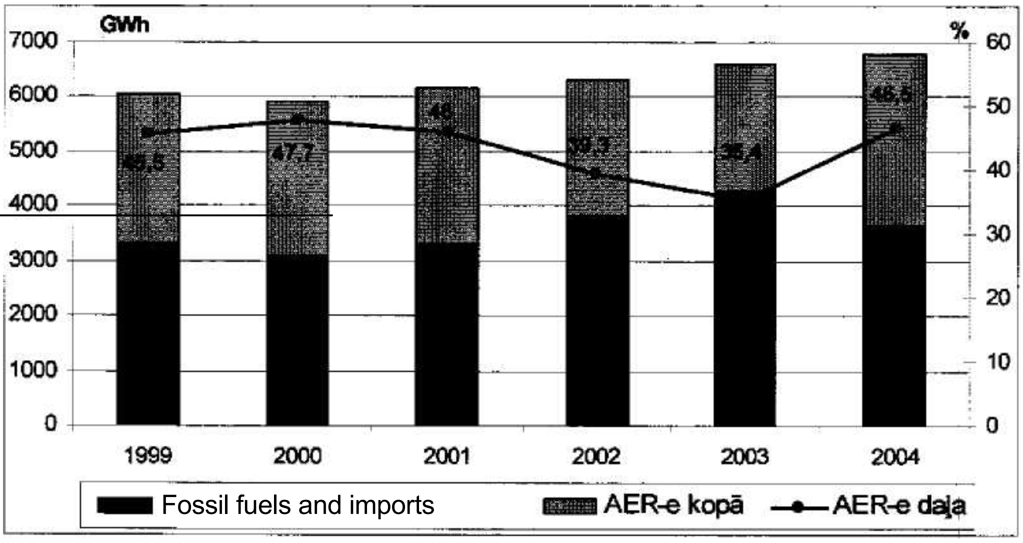
Based on this Law the Cabinet of Ministers has to adopt the following regulations in the first half of 2006:

- On mandatory procurement of electricity from co-generation plants and the pricing procedures depending on the capacity of the plant and the type of the fuel used.
- On the procedure of receiving the guarantee of origin of the produced electricity.
- On the mandatory share of electricity produced from renewable energy sources in the total electricity consumption in Latvia.
- On the criteria according to which the producers using renewable energy sources qualify for the rights to sell electricity within the

amount of mandatory procurement of electricity, and the procedures of pricing.

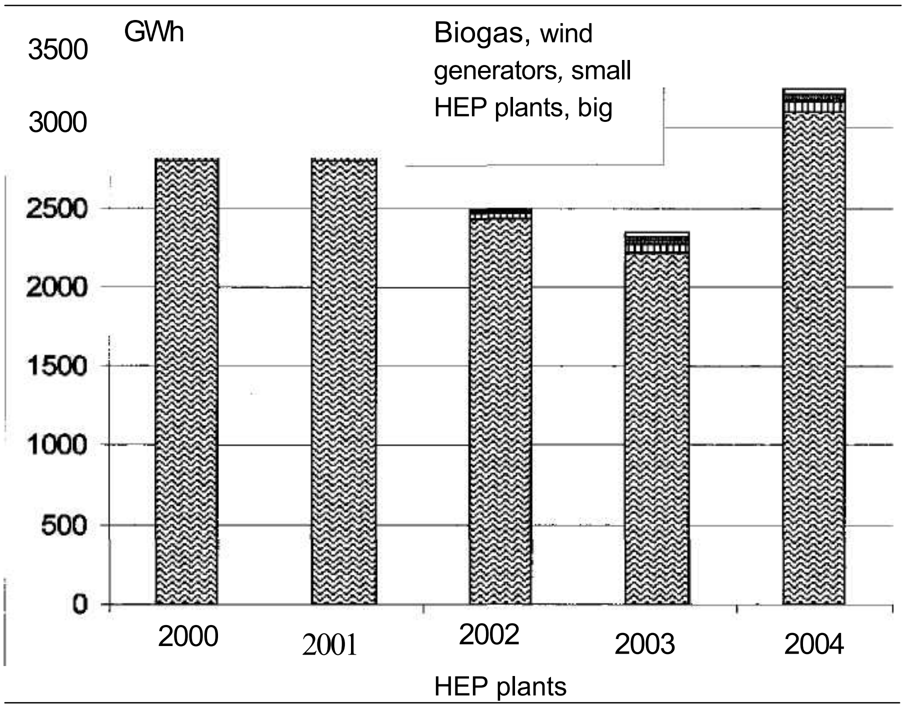
Generation of Electricity from RES

The share of renewable energy resources in electricity generation in Latvia is very significant, in 2004 it was 46.5 % (see picture 4). Hydrosources are mainly used in the big hydroelectric power plants of the public stock company *Latvenergo*. In 2004 the independent producers – the small hydroelectric power plants, wind and biogas electric power plants - provided only 2%[1] of the total amount of electricity produced in Latvia. Taking into account the fact, that the amount of electricity produced largely depends on the flow of water in the Daugava, the share of renewable energy resources in the consumption of electricity may essentially vary. The amount of electricity produced from various RES is seen in picture 5. The share of small HEP plants was only 1.9 % in 2003, but that of wind energy – 2 % of the total amount of electricity produced from renewable energy resources (RES-e) (Picture 6).

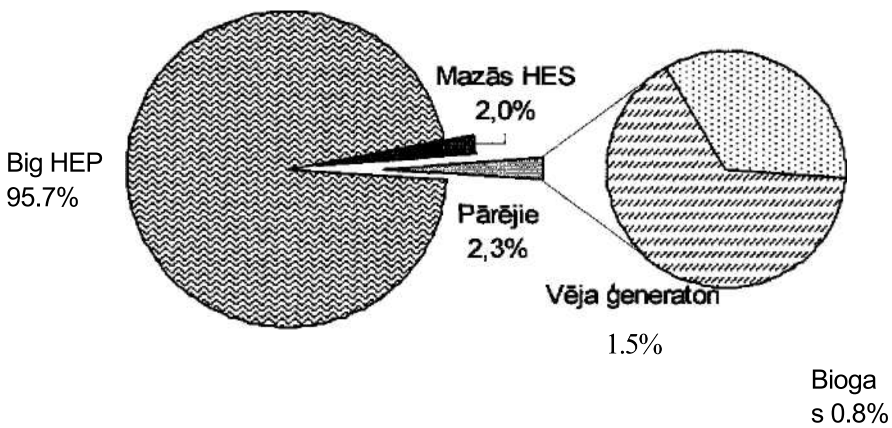


Picture 4. The structure of electricity supply and the share of electricity produced from renewable energy sources.
Source: Central Bureau of Statistics

[1] Data provided by *Latvenergo*

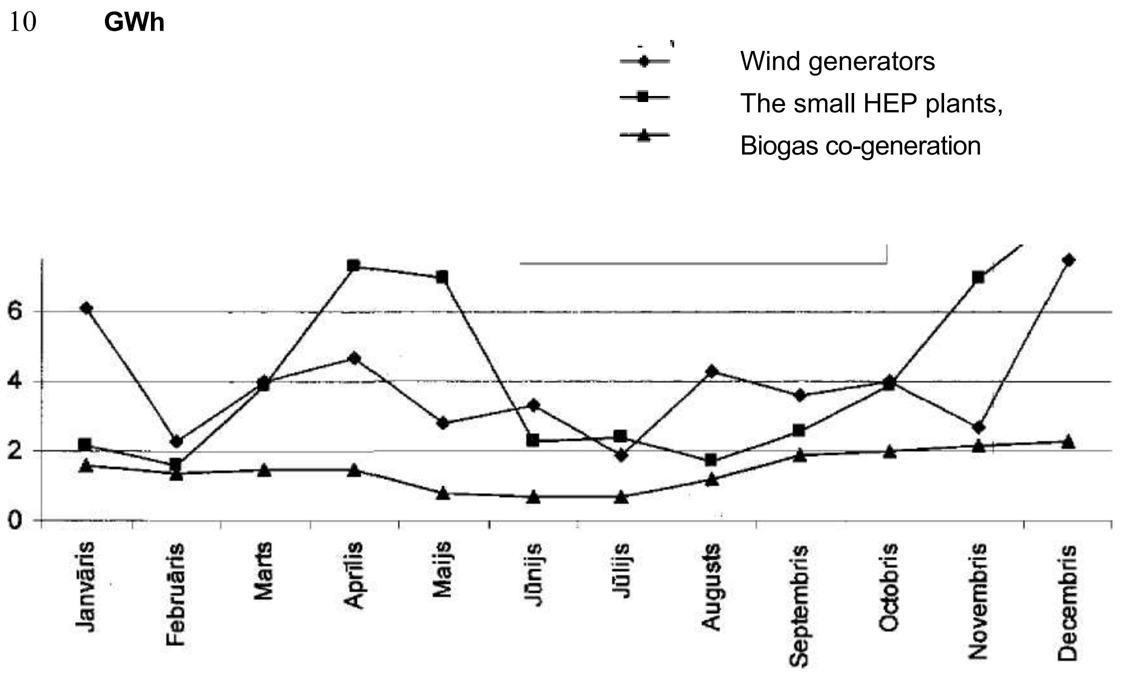


Picture 5. The amount and structure of electricity produced from renewable energy sources. Source: Central Bureau of Statistics.



Picture 6. The structure of electricity produced from renewable energy sources in 2004 (Big HEP plants 95.7 %, Small HEP plants 2.0 %, Wind generators 1.5 %, Biogas 0.8 % and the rest 2.3 %). Source: Central Bureau of Statistics.

Picture 7 shows the different operation regimes of those electricity generation technologies which use RES within a year's time. At small electric power plants the greatest amount of electricity is produced in the spring months, with wind generators the amounts vary within the year, but the co-generation plants produce the greatest amount of electricity during the heating season. Thus, in amplifying the input of independent electricity producers, greater attention should be paid to their integration into the electricity supply system.



Picture 7. Electricity produced by the small hydroelectric power plants, wind generators and the small co-generation plants in 2003. Source: Central Bureau of Statistics.

y-axis: January, February, March, April, May, June, July, August, September, October, November, December

The Use and Potential of Renewable Energy Sources

Biomass

The Biofuel Law and Energy Law of Latvia define biomass as the biodegradable fraction of products, waste, and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste. The type of biomass most often used for energy generation in Latvia is wood, a small amount of straw is also used, as well as biogas obtained from anaerobic decomposition of biodegradable materials. It is possible to use biomass as basic fuel or blend it with other fuels in installations that use fossil energy sources, e.g., coal co-generation plants.

Wood

Wood is the major local fuel in Latvia. In 2004, the share of wood in the total amount of primary energy sources was 24.4%[2] from the total electricity consumption. Wood is used in centralized, local and individual heating systems, and its share in energy supply (heating and electricity production) was 45 % in 2004. In 2004 74 % of wood used for energy generation was firewood, 20 % were woodchips and 6 % were wood residues[3]. Wood residues from the small

2 Data provided by the Central Bureau of Statistics
3 Data provided by the Central Bureau of Statistics

felling areas and the small wood processing plants are used in small amounts because of their high costs[4].

Annual wood consumption for energy generation in Latvia by years can be seen in table 2. It is evident that it has a tendency to grow.

Table 2. Wood consumption for centralized energy generation in TJ

	2000	2001	2002	2003
Thermal power plants of general use	0	208	636	898
Boiler-houses of general use	5 286	5 829	6 465	7 564
Enterprise thermal plants		26	54	47
Enterprise boiler houses	3 049	3 250	3 739	4 074
Total	**8 335**	**9 313**	**10 894**	1 583

Source: Central Bureau of Statistics

It has to be marked that Latvia is exporting great quantities of wood for energy generation. In 2004 1.4 million t of wood, consisting of 1 million t of wood chips and 400,000 t of wood pellets, were exported from the ports of Latvia. The energy value of this amount of wood is approximately 15,000 TJ. The total energy value of wood exported for energy generation in 2004 was 20,314 TJ[5]. For comparison — this amount of energy equals the amount consumed by the whole electricity supply system in Latvia, i.e., 7,000 GWh or 25,180 TJ[6].

The great potential of wood in Latvia can be explained by the fact that forests cover 45 % of the territory of the country, their total area is 2923.2 thousand ha. The average forest area per head in Latvia is 1.25 ha, which is 4.5 times more than the average figure in Europe. At the beginning of 2004 the total amount of wood in the forests of Latvia was 578 million m^3. The annual increment of wood is 16.5 million m^3 on the average, but in 2004 10.75 million m^3 of trees were felled, i.e., 66 % of the annual increment[7]. However, we have to take into account the fact that a great amount of the increment consists of brushwood and wood of little value, but the felled trees are valuable timber.

According to the resource types wood used for energy generation can be divided into the following groups:

- wood processing by-products and residues;
- firewood;
- residues from the main felling areas and sanitation felling areas;
- brushwood;
- stumps;
- annual amount of naturally dying wood;
- secondary wood waste (wood from garbage dumps)

4 Market Analysis of Wood Used for Generating Energy; Vides projekti Ltd., 2004

5 Source: Central Bureau of Statistics

6 The Impact of the Energy Sector on Economic Development and the Quality of Life. Investment and Development Agency of Latvia, 2005

7 Source: State Forest Service

Several studies of the assessment of the potential of wood resources have been made. The assessment data differ significantly. That is why table 3 gives the average data of different sources[8]. The assessed potential of wood biomass was recalculated in accordance with the data of roundwood processing in 2002 and the methodology generally used in studies of this type[9].

Table3. Fuelwood potential in Latvia

Fuel wood type	Potential in mill. m^3a year	Potential in PJ
firewood (roundwood of little value)	1.8-2.4	12-16
felling wood waste (including sapling care)	1.8-2.7	12-18
brushwood	0.3 – 0.75	2-5
Stumps	0.1-0.4	0.7-3
annual amount of naturally dying wood	-0.3	-1.5
woodprocessing by-products and waste	1.6-4.5	14-37
secondary wood waste from garbage	-0.3	
Total	6.2-11.35	44.5 – 82.5

We see in table 3 that the greatest assessment differences are related to timber and wood felling residues as well as to wood processing waste. The lowest assessment mark of the potential is lower than the annual consumption amount of wood resources, excluding the exported wood resources. Obviously, the potential of timber and wood felling residues and wood processing wastes have to be related to the development of technologies (since they determine the efficiency of fuel use) and the price level of woodfuel in comparison with other energy resources. The current tendency to raise prices of fossil fuel resources may foster the development of the potential of wood resources of little value.

At present firewood obtained from cut roundwood is mainly used. A great deal of firewood corresponds to the demands set for timber which could be used for processing value-added wood products. That is why in the future more attention

8 Renewable energy sources program, 2000. Prepared by *C0WI Euginccrs and Plannen AS-Bkb EC DG1A and LK* for the Ministry of Economics within the framework of *Phare* Energy Sector Agreement Nr.SFR96704.
Latvia; Sectoral Environmental Assessment on the Utilization of Domestic Peat and Wood as a Fuel Source for Heating Systems, 1995. Prepared by Swedish
Board for Investment and Technical Support LK for the Ministry of Environmental Protection and Regional Development and the World Bank; according to the methodology used in the report, the wood biomass potential assessed in the report was recalculated in accordance with the felling data for 2003.
Latvia: Wood Harvesting, Distribution and Conversion Study, 1995. Prepared by *Jaako Poery Dentehland GmbH* for the European Reconstruction and Development Bank; according to the methodology used in the report, the wood biomass potential assessed in the report was recalculated in accordance with the felling data for 2003.
Strategy for Utilizing Sawdust and Wood Processing Waste in Latvia. Final report: World Bank & *LR VARAM*, consortium *Indufur Ūy* (Helsinki),
Plancenter Ltd. (Finland), *VTT Energy (Iyvaskyla*, Finland), 1999.
Bntnanis K. The Use of Wood in Energy and Building. First stage report of the National forest program

9 Implementation of long-term planning instruments in the assessment of climate change, emission decrease and renewable sources development scenarios, LAS Institute of Physical Energetics, draft report, 2005

should be paid to a more complete, effective and rational utilization of wood and wood waste.

Wood is mainly utilized to generate thermal energy, yet woodfuel could be used much more economically if it were generating both thermal energy and electricity. It takes 30 % less fuel to produce thermal energy in a co-generation process than to produce the same amount of thermal energy and electricity separately. Besides, the advantage of wood co-generation lies in the possibility to use local fuels and to apply a CO2 emission factor of zero to the wood used. The main drawbacks of this technology are the high capital and operational costs, hindering the development of co-generation. At present there are only 4 wood co-generation installations in Latvia, with a total electric energy capacity of about 2.5 MW.

Straw

At present there is one boiler house using straw as fuel in Latvia. It is financially assisted by the Energy Agency of Denmark. It produces 20 TJ of thermal energy a year, utilizing 1300 t of straw[10].

Straw obtained from agricultural activities in Latvia has not been considered a significant source of potential fuel.

The total annual amount of excess straw in Latvia is between 150 and 570 thousand tons and has a distinctly regional character, the greatest amount of excess straw is produced in Zemgale. Given that the average calorific power of straw is 4.0 MWh/t, the total energy value of the above mentioned amount of straw is 2.2 – 8.2 PJ[11].

The utilization of straw as fuel depends on the distance of transportation, climactic circumstances, storage conditions, etc. Taking this into account when planning the use of straw as fuel, the above mentioned potential amount of straw fuel should be decreased.

Analysing the structure of Latvian agriculture and the objectives of agricultural policy, we can forecast that grain crop growing will not significantly increase over the next few years. The advisable production and consumption amount is 0.2 PJ. As the straw resources are produced in the countryside, they should be utilised in small village or rural boiler houses, their capacity not exceeding 2 MW[12].

Biogas

Biogas is combustible-gas obtained in the process of anaerobic

10 Renewable energy Sources in Estonia, Latvia and Lithuania: Strategy and Policy Targets, Current Experiences and Future Perspectives. Baltic Environmental Forum. Riga, 2003

11 Renewable energy sources. Final report. *PHARE*, 2000

12 Implementation of long-term planning instruments in the assessment of climate change, emission decrease and renewable energy sources development scenarios. Study report. State Road Fund, 2005

fermentation of biomass. It contains on the average 60-75 % of methane (natural gas) and 25-40 % of CO2 (carbon dioxide).

There are biogas co-generation installations in Latvia the joint capacity of which is 7.5 MW. The capacity of the generator installed at stock company ,,Rīgas ūdens" Ltd. (Rīga Water) biological water purifying station ,,Daugavgrīva" is 2 MW. Active slime is used for obtaining biogas. At the waste deposit site ,,Getliņi" biogas is obtained from waste biodegradable fraction; the installed generator of 5 MW is not used, though, to its full capacity. According to the Liepāja region municipal waste management project a biogas generator having the capacity of 450 kW has been installed and is functioning. In the future it has been planned to use one more generator with the capacity of 1 MW, when there is a sufficient amount of biogas produced from waste. The total amount of electricity generated by biogas is 1 % from the amount of electricity produced by renewable energy sources. The potential sources of obtaining biogas are:

biodegradable municipal waste,

active slime,

processed pig and cattle dung,

animal waste,

organic waste of food industry,

green mass (grass, garden waste).

In the process of biogas generation various hazardous organic wastes are neutralized, thus, biogas is not only a valuable source of energy, but it has a significant role in the ecological aspect — in decreasing environmental pollution and collecting greenhouse gases. Proper procession of stock-breeding waste is essential in environmentally friendly agricultural activities. But the utilization of active slime to generate biogas is the only method providing secure slime processing in order to use it as manure, since the thermophyl process helps to exterminate pathogens, parasite eggs and weed seeds, while the usual method of slime freezing does not give such an effect.

The amount of biomass resources usable for biogas generation was assessed in 2004 as follows: 5.8 million t — manure; 400 thousand t – biodegradable municipal waste; 34 thousand t – animal waste; 180 thousand t – sewage slime (36 thousand t of dry slime); a small amount of waste from public catering and food processing. From this amount of biomass 290 million m3 of biogas can be obtained, which can generate about 5 PJ of energy, at the same time providing manure for agriculture. Assessing the technical and organizational possibilities, the total potential of generating biogas could be 121 million m3 a year, yielding about 2 PJ of energy13.

[13] *Agito Ltd.* The Potential of Biogas Generation in Latvia. Riga, 2005

In the course of time production getting more centralized (larger farms and enterprises), logistics, the sorting practice of biodegradable materials and the work of the controlling institutions improving, the volume of available biogas will increase.

Hydroenergy

The second major renewable energy source in Latvia is hydroenergy. It supplies 98 % 14 from the total amount of electricity generated by RES. The use of hydroelectric power plants (HEPP) and watermills has long-standing traditions in Latvia which go back to the first half of the XX century. Conditionally the HEPP can be classified according to their capacity. Recently it was considered that small were those HEPP the capacity of which was not more than 2 MW, but at present small HEPP are those whose capacity does not exceed 5 MW. This classification follows from Electricity Market Law, since HEPP the capacity of which exceeds 5 MW are not eligible for special terms of energy purchase that are applied to RES.

Hydroenergy is used in 3 big Latvenergo hydroelectric power plants on the Daugava cascade (Ķegums HEPP, Pļaviņas HEPP and Rīga HEPP) and in 14915 small hydroelectric power plants. The capacity of the small HEPP in Latvia and their output is seen in tables 4 and 5.

Table 4 The capacity of hydroelectric power plants

Hydroelectris power plants	Capacity in MW
Pļaviņas HEPP	870
Rīga HEPP	263
Ķegums HEPP	401
Small HEPP	26.2

Source *Latvenergo*

Table 5. Energy generated at the HEPP in GWh

	2000	2001	2002	2003	2004
Big HEPP	2794	2796	2431	2212	3039
Small HEPP	25.3	37.1	32.6	50.85	65.52

Source: Latvenergo

The amount of electricity generated at the hydroelectric power plants is changeable. In the last five years it has varied from 2.2 TWh to 3.0 TWh. The increase of the amount of electricity generated at the small hydroelectric power plants in 2003 in comparison to 2000 can be explained by the rapid growth of the number of HEPP in this period. In 2001 and. 2002 more than 40 HEPP having the total capacity of more than 10 MW were built, since the government promised aid in the form of double tariffs.

Viewing the potential of hydroelectric plants in Latvia, we find that the following development tendencies of the small HEPP are possible:

[14] 2004, source - *Latvenergo*

[15] 2004, source - *Latvenergo* It has to be marked that the data on the number and capacity of the small HEPP provided by the public stock company *„Vides projekti" Ltd.* (Environment projects) study differ from those of *Latvenergo* – the total capacity of 150 small HEPP is 27.3 MW

HEPP of small capacity functioning at their former places or places of former watermills,

HEPP of small capacity functioning at “new” places,

Technological updating of the existing small HEPP, increasing their effectivity and decreasing their negative impact on the environment.

There is also the possibility to build big hydroelectric power plants, in some cases erecting also dams to avert the risk of floods in territories near the Daugava river (esp. in Jēkabpils). According to Latvenergo estimates, the potential capacities of the new hydroelectric power plants on the Daugava river could possibly be 30 MW in Jēkabpils and 100 MW in Daugavpils16. Yet we have to take into account the fact that the implementation of the big hydroelectric power plant building projects is hindered by the negative attitude of society towards them and the risk of negatively affecting specially protected nature reserves (NATURA 2000).

In 1999 an assessment of the potential of small rivers in Latvia was worked out in Jelgava17.The calculation of their hydrotecnical potential is based on the river hydrology. The study reviews about 293 plants whose anticipated output could exceed 100,000 kWh a year per plant. The total yearly output was estimated at 150 million kWh. From the plants included in the list 105 plants have been reconstructed, but 188 plants are currently not in use. Practically the hydroenergy resources of the small rivers range from 150 to 300 million kWh electricity a year. In 2004 the total output of the small HEPP was 65 million kWh. It means that from the potential resources of the small rivers only 20 % - 40 % are being utilized.

According to the data of the Latvian Small Hydropower Association, it is currently possible to build new plants with the capacity of 15.4 MW on seven small rivers which could generate 51 million kWh of electricity yearly in Latvia. Electricity supply of the existing small HEPP could be also increased by modernizing them. Taking into account the financial and technical possibilities of the existing HEPP to implement new technologies, electricity supply could be increased by 10-20 %. Latvian society has different views on the impact of small HEPP on the environment. The public stock company „Vides projekti” Ltd. made a study of that impact in 2004-200518. It lists 24 environmentally hazardous small HEPP. The main solution the study offers is the implementation of new, environmentally friendly technologies, the revision of the existing norms for water level fluctuations and enhanced supervision of the compliance of the small HEPP to the laws and regulations controlling their activities.

[16] National energy resources program in Latvia, 1998

[17] *J.Strūbergs, K.Siļķe.* Assessment of the Hydroenergy Potential of Small Rivers in Latvia. Jelgava, 1999

[18] Performance assessment of the small hydroelectric power plants. Public stock company *“Vides projekti” Ltd.* Riga, December 2004 - January 2005.

Wind energy

At present Latvia has wind generators having the total capacity of 26.9 MW. Their most rapid growth was observed in 2002, when generators with the capacity of 23.8 MW were installed. Currently there are seven enterprises using wind energy which have installed 41 wind generators. The amount of electricity supplied by wind generators during a number of years is shown in table 6.

Table 6. Electricity produced by wind generators in GWh

	2000	2001	2002	2003	2004
WES	4.4	3.4	11.2	48.5	49.1

Source: Latvenergo

The distribution of wind energy resources in Latvia is irregular. Latvian wind atlas shows zones with various wind speed intervals — from 3.5 m/s to more than 5.0 m/s. The potential of wind energy has been studied and assessed in several projects yielding different results. Theoretically, the average potential is from 250 to 1250 million kWh or from 0.8 to 4.5 PJ a year19. According to the estimates of the Latvian Wind Energy Association, it is possible to install wind generators in Latvia with the total capacity of 600 MW.

Part of the regions in Latvia with the highest estimated wind utilization potential are protected nature reservation territories and restrictions on economic activities are in force in them. In the last years there is a new tendency in the world – to set up wind generators at sea that allows to overcome the existing legislative barriers for land-based wind generators. The costs for setting up the installations necessary for this technology are higher. The use of wind energy is determined by the fact that the velocity of wind is not constant. It hampers the operation of wind power plant installations since at times the occasional low energy yield has to be compensated from other sources. One more barrier to choosing wind generators is the necessity to integrate them into the electricity supply grid. Thus, the utilization of wind energy is determined not only by the availability of wind energy but also by technical demands.

Solar energy

Solar energy can be used to generate thermal energy (solar collectors) and electricity (photo voltaic elements). In Latvia the sun rays have comparatively low intensity. The total amount of solar energy is 1109 kWh/m2 a year, which is a little more than in the Scandinavian countries. In Latvia solar thermal energy can be used from the last ten days

[19] Implementation of long-term planning instruments in the assessment of climate change, emission decrease and renewable energy sources development scenarios. Study report. State Road Foundation, 2005

of April when the intensity of sun rays is 120 kWh/m2 to the first ten days of September. During this period (approximately 1,800 hours) it is possible to use solar energy by installing solar collectors. At present within the framework of pilot projects solar collectors have been installed in Aizkraukle[20] — on the roofs of the secondary school and the boiler house (absorber area 208 m2) and in Ulbroka[21] at the mechanical workshop of the SC „Grauds PI" Ltd. (absorber area 4 m2). The installations are used to obtain warm water. In Aizkraukle the project is being implemented with the financial aid of the Energy Agency of Denmark. The experimental installation at Ulbroka is used for research purposes. The projects have demonstrated that solar energy cannot compete at present with other forms of energy due to its high costs. However, Latvia has sufficient amounts of solar energy resources for practical use.

Potential purposes for utilizing solar energy in Latvia could be hot water supply in summer months, especially at summer houses, hotels, grain drying-kilns or for haymaking. The use of solar energy has to be planned in order to ensure hot water supplies in the summer months, since in order to satisfy the demand for hot water all year round it is necessary to combine solar energy with traditional ways of obtaining thermal energy. However, it increases the capital and operational costs.

As Latvia has done research of the potential use of solar energy to generate electricity, it would be advisable in the future to implement projects on the practical use of photovoltaic equipment combining this with other energy resources.

Geothermal energy

Various studies point out that the main resources of geothermal waters are situated in the southwestern part of Latvia at a depth of 1,300 — 1,800 m. The temperature of the Jelgava-Eleja region underground waters is 25-30°C. The total area that could be used to generate geothermal energy is 12,000 km2. The building of a low-capacity geothermal power plant producing a few MW in the southern part of the Liepāja region or in the vicinity of Eleja[22] seems most promising. However, the utilization of geothermal heat is hindered by the comparatively low temperatures of underground waters.

Geothermal heat pumps for heating buildings are also available on the Latvian market.

Fixed tariffs

Up to 2005 state policy concerning RES was realized by setting quotas each year for the establishment of new electrical capacities. Energy

[20] www.gimnazija.aizkraukle.lv
[21] LZP Scientific project No. 01.0518 annual survey
[22] State Geology Service. Earth's Core Resources in Latvia. Riga, 1997

procurement for fixed tariffs was guaranteed from these capacities. The new capacity quotas for various types of RES in the previous years have been the following.

Table 7. Capacity quotas for electricity generation from renewable energy sources [23]

year	Total	hydroen.	wind en.	biomass	biogas	other
2002.	30 MW	10 MW	0	10MW	10MW	0
2003.	3MW	0	1MW	1MW	1MW	0
2004.	2MW	0	0	1MW	1MW	0
2005.	23 MW	0	0	20 MW	3MW	0

Latvia has supported electricity generation from renewable energy sources in the form of fixed tariffs. The terms for receiving support have often changed. That is why there are energy producers in Latvia who use one type of renewable energy resources but sell the generated energy according to different terms – double tariffs, average sales tariffs, tariffs fixed by the regulator and contract prices. In 2005 the Energy Law deleting articles regulating support to electricity generated from RES and the Electricity Market Law were adopted, which do not determine fixed tariffs. That is why support in the form of fixed tariffs is not applied any more. However, there are some electricity producers who still receive it due to contracts concluded earlier.

The System of Achieving RES Indicative targets

GWh, new capacities are indicated in the brackets

	2004	**2010**
Electricity consumption in GWh	**6786**	**7642**
Big HEPP	2790	2790
Existing small HEPP	58	70
New small HEPP		8 (2.5 MW)
Existing wind generators	47	47
New wind generators		298 (133 MW)
Existing biomass ans biogas power plants	25	27
New biomass and biogas power plants		510(78MW)
Biomass as additional fuel in co-generation		18(3MW)o
Total	**2926**	**3768**
% share	**43.0%**	**49.3%**

[23] Cabinet of Ministers Regulations No. 28 of 15 January 2002; Regulations No.545 of 30 September 2003; Regulations No. 40 of 24 January 2004 and Regulations No. 250 of 4 December 2005.”Regulations regarding Total Volume and Specific Volume for Each Type of Electric Power Generation, if Renewable Energy Resources are Utilised for Electric Power Generation”

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The Compatibility of Support Measures to the Electricity Produced from RES with Latvia's Commitments in the Context of Climate Change

1. Latvia's Commitments to Reduce Climate Change

In 1995 the Saeima of the Republic of Latvia ratified the UN Framework Convention on Climate Change. The Convention stipulates that up to 2000 member states have to stabilize greenhouse gas emissions at the 1990 level, a task that Latvia has fulfilled. In 2002 Latvia ratified the Kyoto Protocol of the Convention, which stipulates that from 2008 to 2012 the average greenhouse gas (GHG) emissions have to be reduced by 8 % in comparison with 1990.

2. The Measures Taken to Achieve the National Indicative Targets

Support measures to electricity generated from renewable energy sources (RES) have been taken starting with the year........, when the.........Law was adopted. The support measures have been described in Chapter.... of the present report. The above measures were implemented already before May 2004, when the demands of the European Parliament and Council Directive 2001/77/EC (27 September 2001) on the promotion of electricity produced from renewable energy sources in the internal electricity market became binding for Latvia and the indicative target – to achieve 49.3 % share of electricity generated from renewable energy sources in the gross national energy consumption by 2010 – was set. After accession to the European Union Latvia started work on implementing the above directive. As the previous support policy to RES was not effective enough, the Electricity Market Law was adopted in 2005, containing provisions for generating electricity from renewable sources and its sale. National support laid down by the Law in the form of mandatory procurement is directly connected with achieving the indicative targets set for Latvia by the directive. The corresponding regulations by the Cabinet of Ministers have been planned for the first half of 2006 providing also the methodology of tariff calculation for electricity produced from RES as well as the terms for its procurement.

The application of fixed tariffs has fostered the increase of RES electricity generation capacity in Latvia from 1,534 MW to 1,597 MW, increasing the number of independent producers by 150. The total capacity of electricity generated by independent producers – wind power plants, small hydroelectric plants, Wood co-generation power plants and biogas co-generation power plants – in 2005 was 63.2 MW.

The following measures to foster the consumption of electricity generated by RES have been taken:

1. Support schemes in the form of fixed tariffs for electricity generated by RES (started before the indicative targets were set).

2. Working out and adopting the necessary laws and regulations (started after the indicative targets were set) — the Electricity Market Law, providing for mandatory procurement of electricity generated by RES, connecting it directly with the achievement of indicative targets.

3. Climate change reduction program for Latvia from 2005 to 2010, the indicative target – to achieve 49.3 % share of electricity generated from renewable energy sources in the gross national energy consumption by 2010 has been included as one of the indices of the results of climate policy implementation. It has been taken into account as an important provision in planning the development of the energy sector in Latvia concerning the amount of emissions.

3. The Impact of the Measures Taken to Meet the Commitments of Reducing Climate Change

In assessing how the increase of the share of electricity generated from RES in the Latvian market influences Latvia's climate change commitments we have to take into account several considerations.

First, we have to stress that Latvia has already met the obligations provided for by the Kyoto Protocol, since the amount of greenhouse gas emissions in the country is less than 92 % from the volume of emissions in 1992 (e.g., in 2003 the total volume of GHG emissions was 41.5 % from the level of 1990). That is why the use of renewable energy sources in generating electricity does not contribute directly to meeting the national commitments. However, Latvian economy developing rapidly, the total volume of GHG emissions gradually increases, and increased utilization of renewable energy sources would help to keep a low level of emissions also in the future.

Secondly, in Latvian national consumption the share of electricity produced by RES is significant – in 2005 it was 46.5 %, and this share is changing depending on the output of the big hydroelectric power plants on the Daugava cascade. The potential of the renewable energy resources in Latvia is used in electricity generation at places where the conditions for its utilization are favourable (hydroelectric power plants, wind on the shores of the Baltic sea, etc.), fossil resources are mainly used at places where there are not sufficient amounts of renewable resources (e.g., in the co-generation plants of big cities). In the last years no less than 30 % of the electricity consumed are imported, the rest is produced by gas co-generation power plants. Having such a structure of electricity supply, it is reasonable to consider the role of renewable energy sources in replacing imported energy – the more electricity is produced by HEPP, the less electricity has to be bought from other countries. But the use of fossil resources in electricity generation is practically not influenced by the increase of the share of RES. Thus, we can come to the conclusion that achieving the national targets Latvia contributes to the reduction of emissions globally, but in meeting the national climate commitments these targets do not have a decisive role.

Thirdly, from 2000 to 2005 independent electricity producers using renewable energy sources have started generating electricity, and it is possible to assess the amount of electricity produced by them from the point of view of reducing emissions. We can use for this purpose the guidelines worked out by the Ministry of Economic Affairs of the Netherlands meant for estimating the emission factors in joint projects of different countries (Operational Guidelines for Project Design Documents of Joint Implementation Projects, Volume 1: General guidelines, Version 2.2 Ministry of Economic Affairs of the Netherlands, June 2003). In these guidelines the carbon emission factor in Latvia from 2000 to 2005 has been estimated as 363 g CO_2 for one kWh of electricity. In this case, the decrease of emissions achieved by the new electricity producers who use RES and started working from 2000 to 2005 can be calculated by the following formula:

Wx 0.363= E 13,501x0.363 = 4.9 W=13,501

E = 4.9 (t) where:

W – is the total amount of electricity (MWh) generated by the new electricity producers who started working from 2000 to 2005.

E – is the decrease of CO_2 emissions (t) during the above mentioned period of time.