Latvia

Country Profile

1. Overview of Electricity Supply

Latvia achieved its independence in 1991 following the collapse of the former Soviet Union. The newly formed government immediately initiated a comprehensive package of reforms including price and trade liberalization, small-scale privatization, and macroeconomic stabilization. Many of these initiatives were successfully implemented and in the later part of the decade, Latvia experienced strong economic growth, single-digit unemployment, and increasing government stability (the national credit rating was raised in 2000 to investment grade by Moody's Investor's Services, Standard & Poor's, and Fitch IBCA). After receiving implementing such successful policies, Latvia was able to join the European Union in 2004.

Latvian's energy supply is based on a balance mixture of energy sources. Renewable energy sources in 2006 represented 33 percent of the primary energy share (IEA, 2006). Latvia's electricity produced by renewable sources was much higher at about 70 percent of the total electricity (EIA, 2005).

The state-owned electric company, Latvenergo, owns a majority of the generation capacity in Latvia. The primary source of electric generation is hydroelectric power from a cascade of dams on the Daugava river, all of which have recently undergone modernization and reconditioning. Additional generation and district heating is provided by two large thermal plants and several smaller privately owned facilities.

Transmission of electricity within Latvia is handled by seven regional transmission networks, all owned by Latvenergo. In 1998 utilities in Latvia, Lithuania, Estonia, and other surrounding countries organized the Baltic Ring Electricity Cooperation (BALTREL) with the goals of interconnecting the individual power markets into a regional exchange, and upgrading production and transmission systems in the region.

Privatization has proceeded gradually since 1994 when the Latvian Privatization Company was formed to privatize all state owned businesses. Today, privatization in Latvia is effectively complete. The country's main energy company, Latvenergo, remains state-owned and no plants to privatize it exist. Today, the private sector accounts for approximately 70 percent of the country's GDP (US State Dept., 2009).

The table below provides summary information about Latvia.

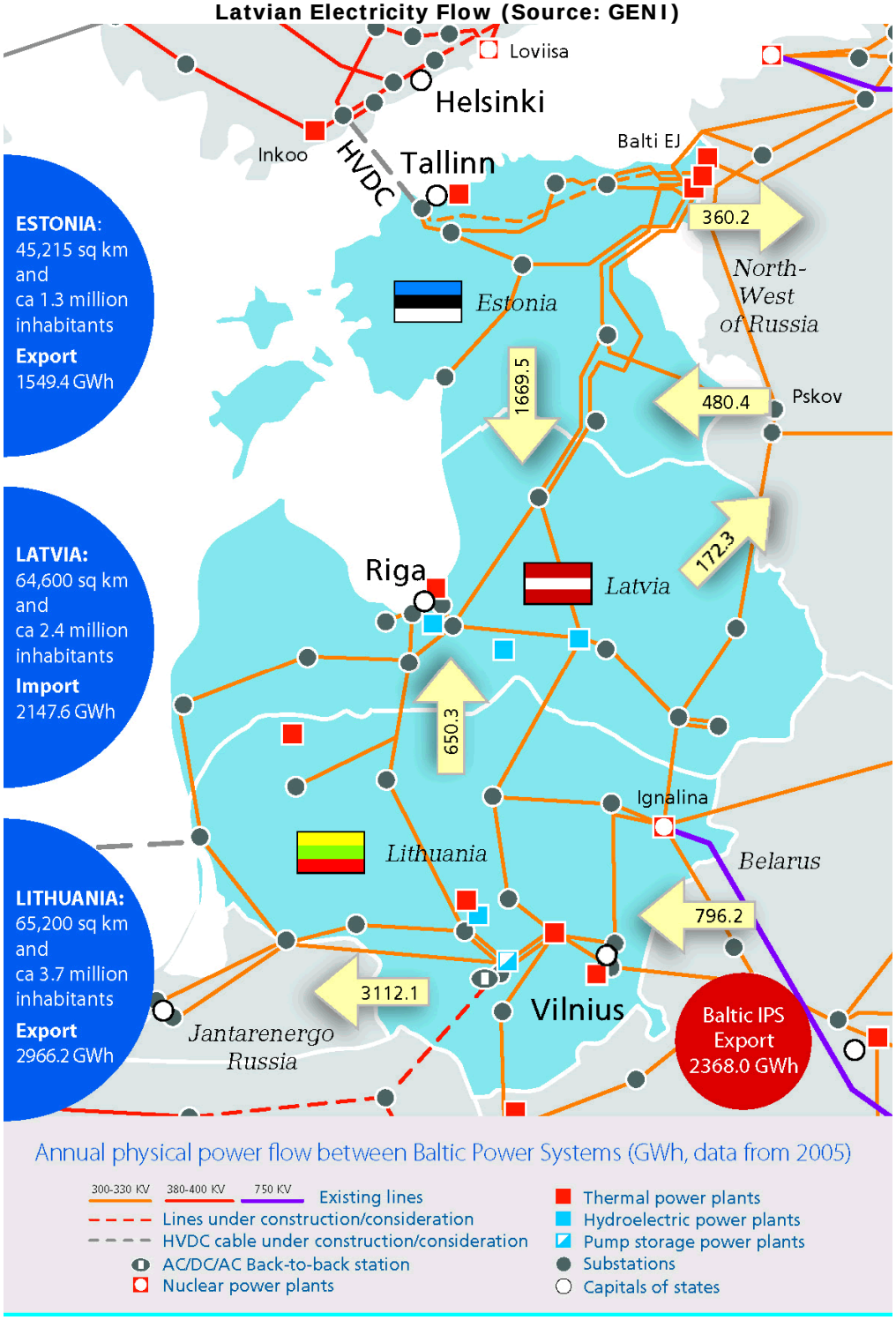
Demographical Information	
Population, millions (2009)	2.23
Land area, thousand sq km (2009)	64.59
Macroeconomic Information (2008)	
GDP, billion US$	39.0
Real GDP growth rate, percent	- 5.0
Foreign direct investment (net), million US$ (2007)	1,941
Electricity disposition, billion kWh (2006)	
Generation	4.73
Consumption	6.42
Exports	0.30
Imports	2.81
Generation capacity, GW (2005)	
Nuclear	0.00
Thermal	0.59
Hydro	1.54
Other renewables	0.03
Total	2.15

Sources: CIA World Factbook, U.S. Energy Information Administration, United Nations Conference on Trade and Development.

Latvia Country Summary Table

The following figure diagrams the electricity flow in Latvia as of 2005. The import and export information is from 2005.

Latvian Electricity Flow (Source: GENI)



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2. Energy Policy, Barriers and Incentives

As a member of the European Union, Latvia has mandatory renewable energy targets set by the EU. By 2020 Latvia must have 23 percent of its final consumption of energy be renewable. Also, at least 10 percent of the final consumption of energy in transport must be from renewable energy sources by 2020. The European Directive from 2001 states that Latvia must have 49.3 percent of their gross electricity consumption be renewable by 2010 (EREC, 2008).

Latvia supports renewable energy activity in the country with a feed-in tariff program. Until January 2003 Latvia had a feed-in tariff that was double the average electricity price. The tariff could be received for a period of 8 years after grid-connection. The tariff was very successful. Since 2003 the regulation Nr. 503 on Electricity Production from RES has been amended. Now, the new tariff system differentiates between the types of renewable energy sources and the amount of installed capacity. A guaranteed purchase exists only for a fixed amount of renewable electricity. The purchase price is calculated as a natural gas price multiplied by a factor (EREC, 2008).

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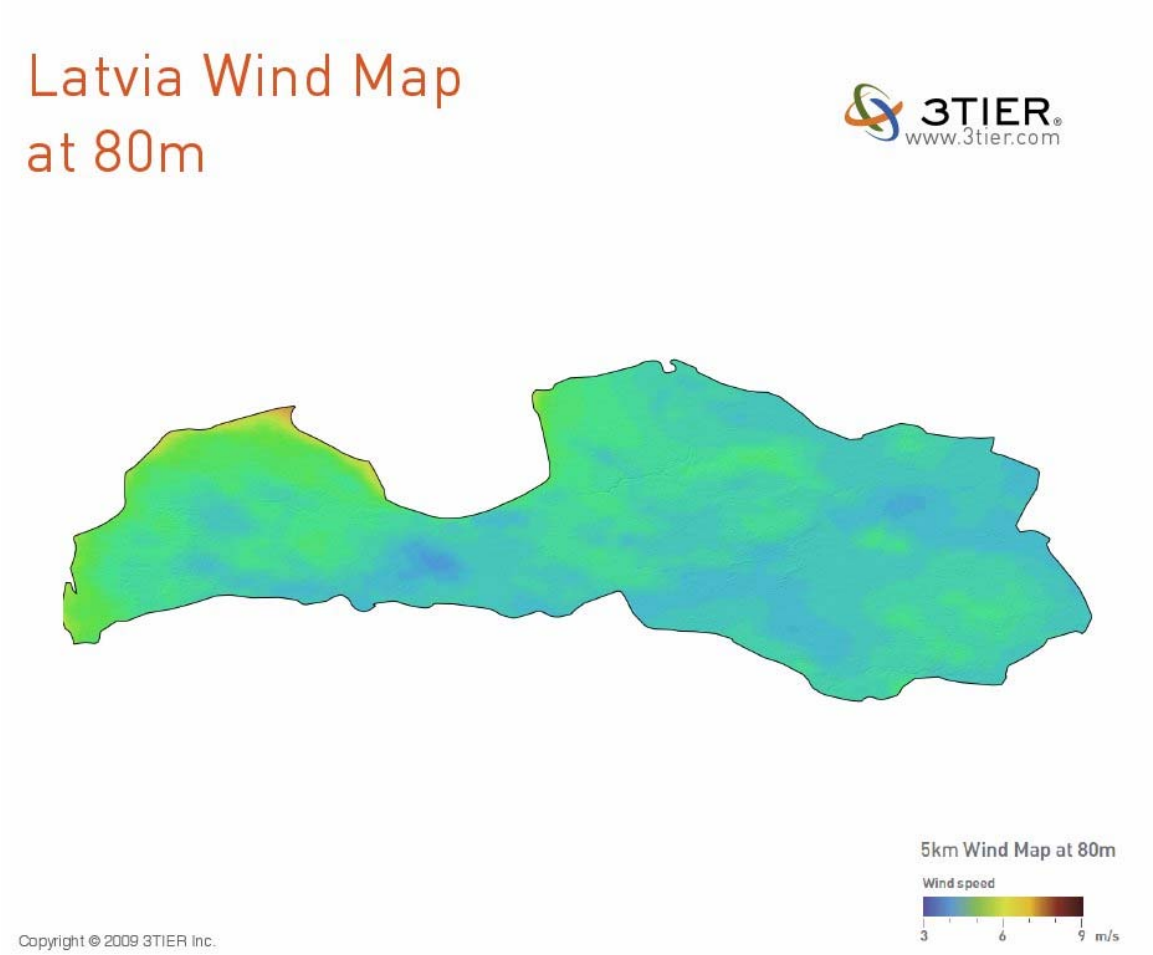
3. Wind

Latvia has a very good potential for wind energy development. The total installed wind energy capacity in Latvia in June 2009 was about 24.5 MW. A majority of the capacity is installed at the 19.8 MW parks at Liepaja on the Baltic coast (UDI, 2009). The parks have 33 Enercon E-40 turbines that were installed in 2003, which produce about 40 GWh of electricity per year. There is great potential for development, and several projects are reportedly planned.

According to the data from the Renewable Energy Program, technical potential for wind energy production has been estimated around 1,277 GWh however the practical potential is estimated at 1,000 GWh/year and it represents about 2,000 MW of wind technical/or economical potential.

The regions with the largest wind speeds are the coast of the Baltic Sean and the eastern coast of Riga Gulf in its northern part. Wind speeds in these areas reach 5.1 - 5.8 m/sec. The width of the Baltic Sea zone is about 15 - 20 km, and the Riga Gulf zone is approximately 10 - 15 km wide (EU PHARE, 2003).

Latvia Wind Resource Map (Source: 3Tier)



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4. Biomass

The use of biomass in Latvia for power production is growing. The use of landfill gas started in November 2002. Wood is the most extensive and common local energy source used for heat generation (22 percent of primary energy consumption in the country).

Biogas installations in Latvia total around 7.5 MW of capacity. Riga Water creates energy from sludge in a waste water treatment plant (2 MW) in Riga. Eco Getlini, also in Riga, collects biogas from landfills for energy production (5 MW), and Liepajas RAS in the Liepaka region utilizes biogas from landfills as well (450 kW).

Latvia's biogas potential was assessed in 2004. A total of 290 million cubic meters of biogas are potentially available for the production of energy. The available biogas is partly comprised of 5.8 million tons of manure, 400,000 tons of household organic wastes, 34,000 tons of animal wastes, and 180,000 tons of sludge from waste water treatment plants (Celmina, 2005).

The use of wood and agricultural biomass for power generation is not considered to be economically viable even with the guaranteed minimum feed-in tariffs in place. The potential use of forest residues is unexploited due to high cost involved for preparation, transportation and storage. In addition, biomass competes in electricity and heat production with peat, which is considered as renewable energy source in the country.

Approximately 12.5 percent of the timber, which is harvested in Latvia every year, ends up being used as heating fuel, and a considerable percentage of scraps from sawmills are used to produce heat energy. Nearly 200,000 m^3 of scrap (mostly chips from sawing) are used every year to produce heating fuel in the form of wood briquettes and pellets.

The major threats for the supply of wood-based fuels are related to increasing export of wood products and potential construction of a pulp and paper factory, which would increase the price for this resource. Decentralization of agricultural production has greatly decreased the potential basis for raw materials for biogas production. Mid-term potential for bioelectricity production for Latvia has been determined as follows: biogas 0.5 TWh/year; solid biomass almost 3.5 TWh/y; biowaste less than 0.1 TWh/y (total 4.6 TWh/y).

Biomass resource type	Total production	Production density
Total land area covered by	(avg. 2006-2007, km²)	(avg. 2006-2007, %)
Arable Land	11,965	19
Permanent Crops	115	0
Permanent Meadows and Pastures	6,390	10
Forest Area	29,578	46
Other Land	14,197	22
Inland Water	2,345	4
Primary crop production	(avg. 2006-2007, tonne)	(tonne /100 km²)
Total primary crops (rank among COO)	2,561,280 (8)	3,965 (11)
Top 10 primary crops		
Wheat	702,800	1,088
Potatoes	596,450	923
Barley	335,100	519
Sugar beet	242,350	375
Rapeseed	166,150	257
Rye	148,950	231
Oats	110,900	172
Cabbages and other brassicas	59,935	93
Vegetables fresh nes	40,000	62
Carrots and turnips	29,970	46
Animal units, number	(avg. 2006-2007, number)	(number / 100 km²)
Cattle	381,150	590
Poultry	4,290,000	6,642
Pigs	422,350	654
Equivalent animal units	592,990	918
Annual roundwood production	(2006-2007, m³)	(m³ / 100 km²)
Total	12,508,750	19,366
Fuel	1,003,500	1,554
Industrial	11,505,250	17,813
Wood-based panels	447,500	693
	(2006-2007, tonne)	(tonne / 100 km²)
Paper and paperboard	58,500	91
Recovered paper	75,000	116

Source: Food and Agriculture Organization of the United Nations

Latvia Biomass Resource Data

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5. Solar

The solar energy resource potential in Latvia is small compared to other European countries due to the geographic location and to the climatic conditions. During the winter months of the year solar energy reaches 0.5-0.8 kWh/m2/day while the yearly average is approximately 2.6 kWh/m2/day (year average).

There is little use of solar resource in Latvia; however, two pilot projects on solar thermal were implemented in Aizkraukle. One project concerns the use of Solar thermal for heating of a Gymnasium School and the other integrated solar thermal in a district-heating scheme.

The solar energy resource potential is small due to the climatic conditions and the northern latitudinal location of the country (between 56^0 and 58^0 north). It is characterized by the data presented in tables below.

	Riga
Jan	43
Feb	98
Mar	254
Apr	376
May	566
Jun	589
Jul	593
Aug	458
Sep	288
Oct	131
Nov	43
Dec	25
Yearly	3464

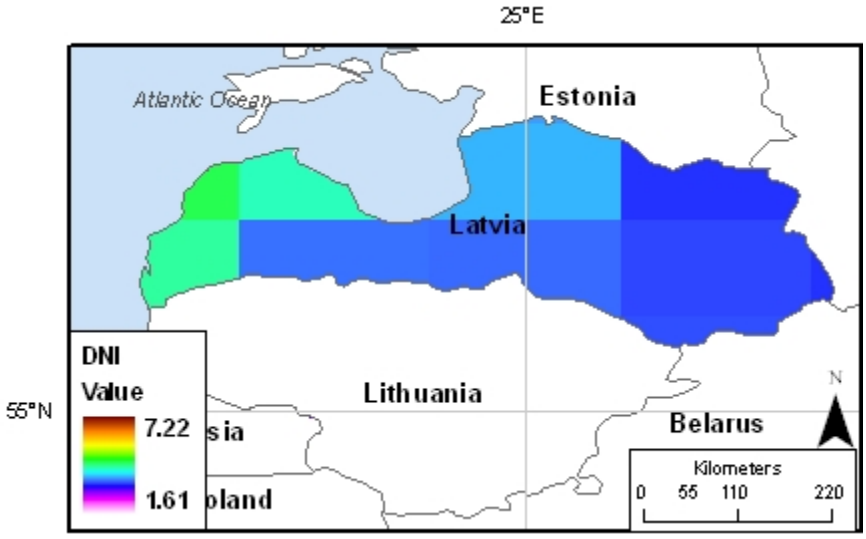
Monthly and annual total solar radiation incident on horizontal surface, MJ/m^2

	Riga
Jan	53
Feb	112
Mar	312
Apr	374
May	542
Jun	565
Jul	547
Aug	431
Sep	304
Oct	147
Nov	50
Dec	30
Yearly	3467

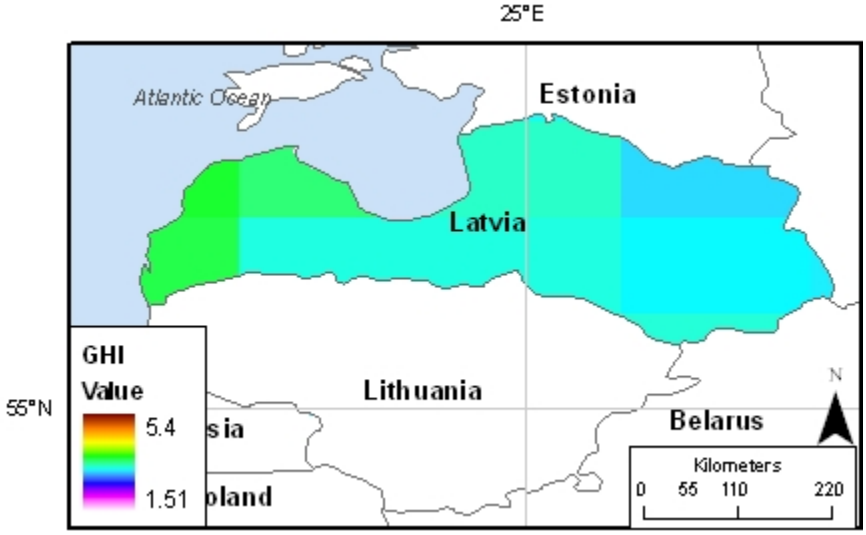
Monthly and annual direct solar radiation incident on surface normal to sunlight beams, MJ/m^2

The following figures display insolation values for Latvia. As shown, the country has moderate solar potential.

Latvia Solar Direct Normal Insolation (Source: NASA)



Latvia Solar Global Horizontal Irradiance (Source: NASA)



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6. Geothermal

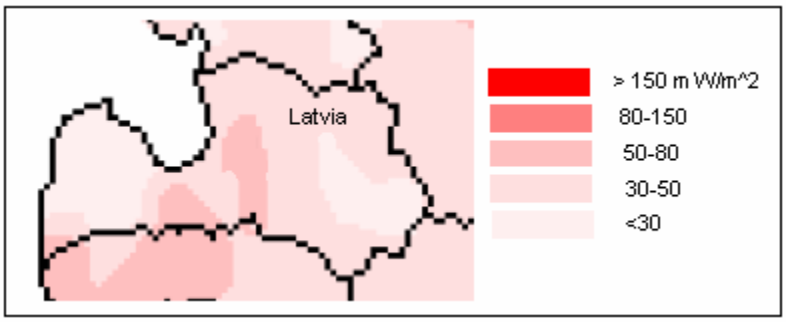
The existing geothermal resources in Latvia are not used. In fact, Latvia does not have sufficient geothermal resources for electricity generation.

With rising heat prices, geothermal heat supply systems with heat pumps could become feasible and there could be plants up to 16 MWth.

The geothermal resources in Latvia are concentrated in the Lower Devonian and Cambrian aquifers in the form of low enthalpy water. As shown in the figure below, the greatest heat

flow is in the southwestern and central portions of Latvia. The geothermal waters vary between temperatures of 25-60 °C. The waters could be used for balneological purposes, fish farming and greenhouses. However, at the moment, the low heat prices for district heating, and the little experience in the field are serious barriers to the development of this resource.

Heat Flow (m W / m^2) in Latvia



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7. Hydroelectric

Hydropower contributes to approximately 72% of Latvia's energy supply. Latvia has three major hydropower plants and 150 small-scale local facilities. There is still unused potential for electricity production on the Daugava River. Currently one large-scale hydropower plant on the Daugava River is delayed after the start of construction, the Daugava (300 MW).

According to the data from the Renewable Energy Program, the technical potential of small hydropower plants (SHPP) in Latvia, taking into account renovation of the old SHPP, is between 28-35 MW equal to about 78 GWh. Currently, 65 percent of the technical potential of the hydro energy has been exploited; 50.84 GWh were generated in SHPP in 2003.

Since 1992 an intensive reconstruction of regionally important small hydro power plants has been underway. At the end of 2001 the total number of small scale HPP in Latvia was 103 and at the end of 2002 there were 149 SHPP with total capacity 24.8 MW. The Law on Energy supports small HPP that started operations before January 1, 2003. The surplus of energy production in these plants should be purchased at a double average electricity tariff.

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8. Relevant Links

Please see webpage for relevant links.

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9. References

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10. Country Contacts

Contacts made in the preparation of this assessment are gratefully thanked for their contribution to this report. Please see webpage for contacts listing.

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