



# Energy supply systems in Latvia

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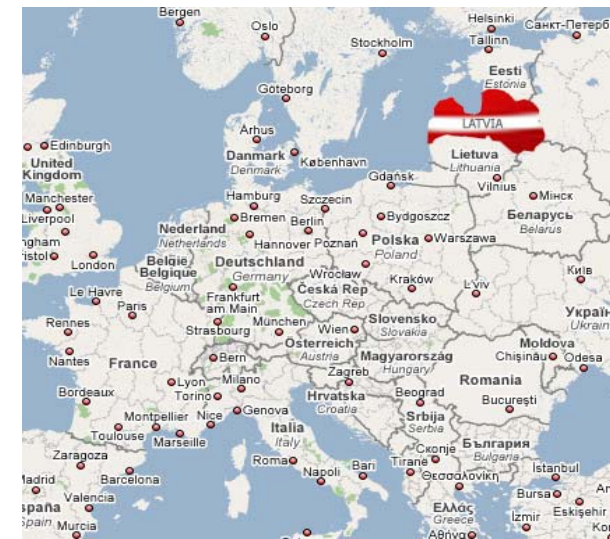
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# Latvia



- Latvia is Parliamentary Republic
  - EU Membership: since 2004
- Population – 2011: 2,067,887
  - Urban: 66%. Rural: 32%
- Territory 64,589 km<sup>2</sup>, with over 44 percent of its territory covered by forests
- Climate -Latvia's weather features a temperate maritime climate, with mild summers, moderate winters, and frequently High levels of humidity and precipitation.
- GDP - \$ 34.921 billion
  - per capita - \$13,662





## Introduction

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Latvia is not rich in the natural energy resources – about 65% of them are imported. Therefore Latvia's dependence on the external energy sources is being retained; the more so – it is ever increasing.

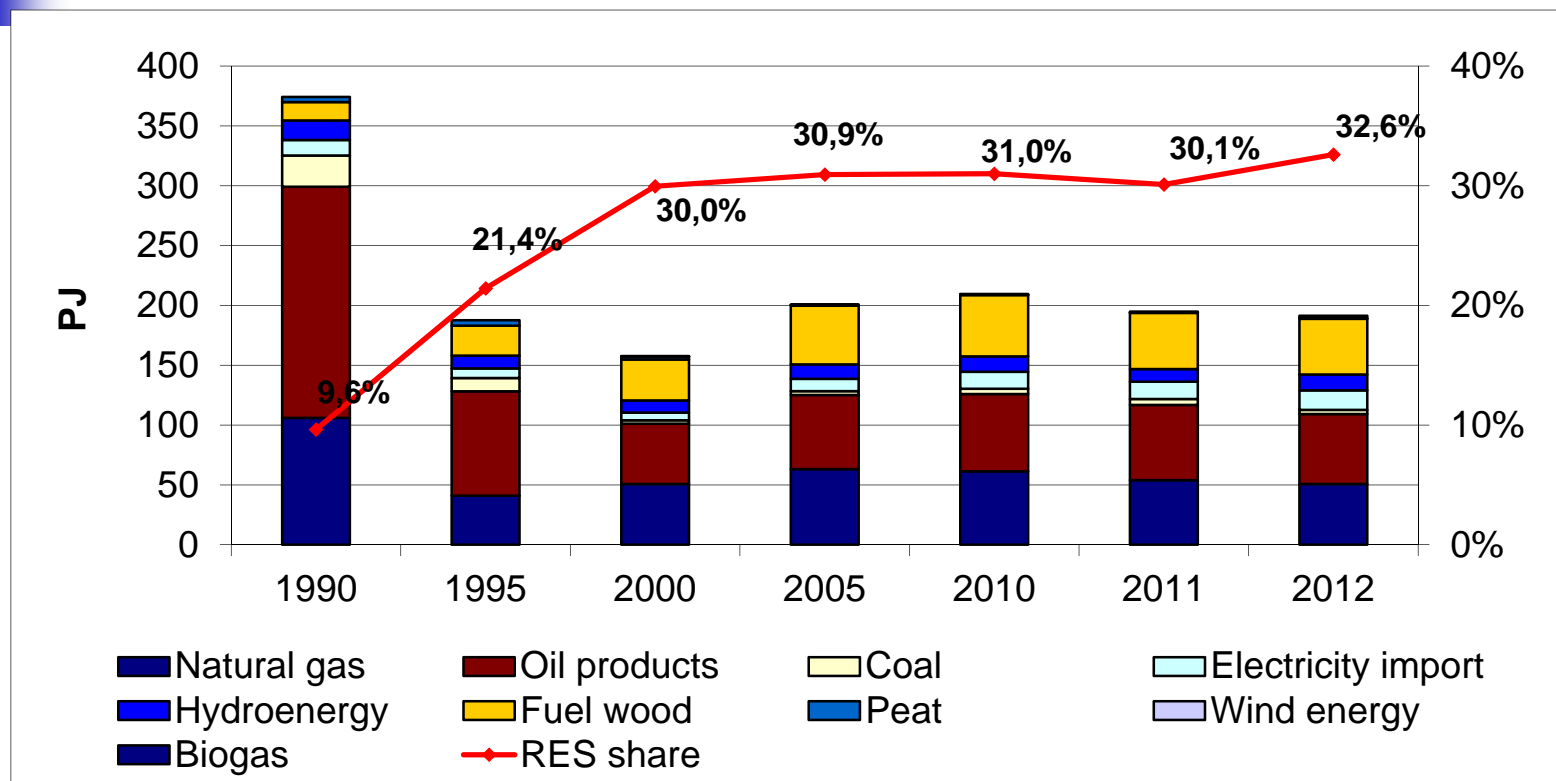
The most used Renewable Energy Sources (RES) in Latvia are wood and hydro resources; besides, the wind energy and energy from waste.

## Latvian energy self-sufficiency and import (2012)



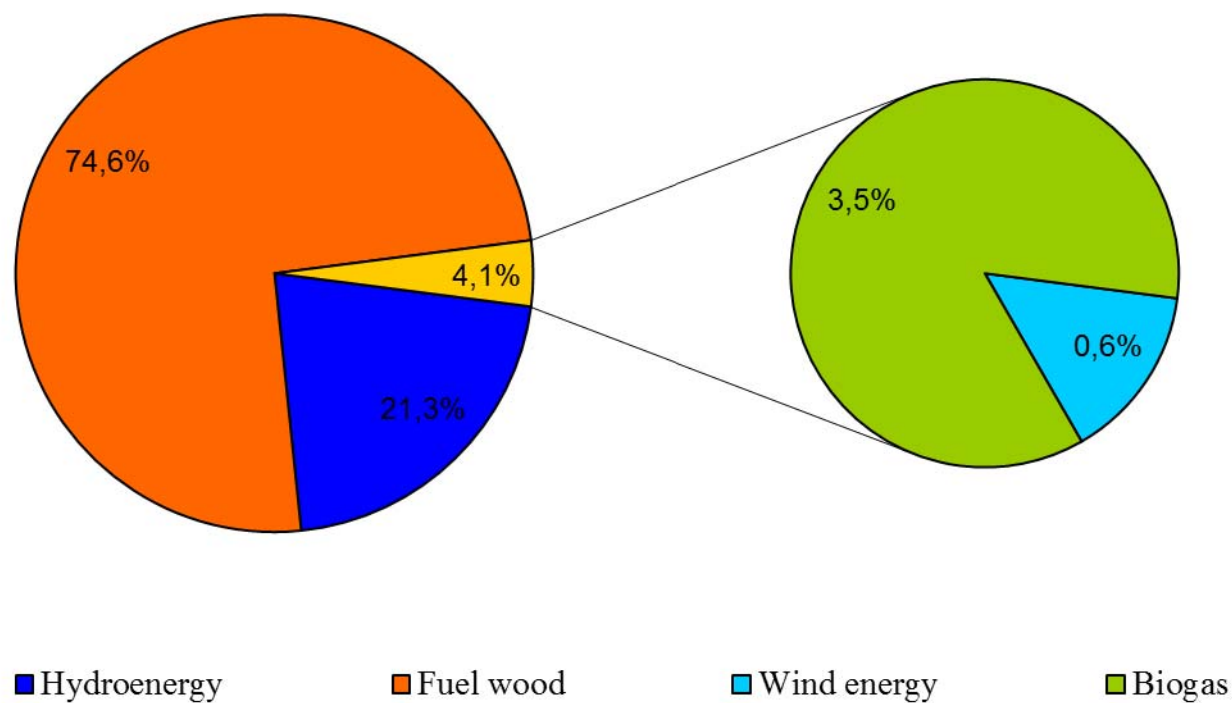
In 2012, the total consumption of primary energy resources in Latvia amounted to 182.9 PJ, and self - security in the total consumption of primary energy resources was 35.2%. In the total consumption of primary energy sources, firewood with its total consumption forming 46.5 PJ (25,4 %) was the most widely used local energy resource, electricity generated in hydropower stations and wind power stations constituted 13.7 PJ (7,5 %).

## Dynamic of primary energy resources supply and share of renewables



The RES share in the consumption of primary resources increased from 9,6% in 1990 up 32,6% in 2012. This happened owing to the wide utilization of wood fuel. The production of electricity from RES in 2012 was 55.03 % of the total its production.

# RES structure in 2012 in Latvia





# Energy legislation in Latvia

- **Energy Law** – the legislative base for Energy Sector.
- Electricity market is regulated by **Electricity Market Law** that entered into force in 2005. This Law reinforces **RES** promotion and their access to the grid on fair conditions.
- **Renewable Energy Law** was accepted (15.02.2011) by the Cabinet of Ministers, but not approved yet by the Parliament.

## **In Latvian NREAPlan** (National Renewable Energy Action Plan)

Share of RES in Gross Final Energy Consumption by year 2020:

- 2010 – RES total in Energy mix 29,9%;
- **2020 - 40%.**
- 2010 - RESe electricity in the electricity mix 48,5%.
- **2020 - RESe - 60% (Share of RES in gross electricity consumption), from which:**
  - Hydro – 58,8%
  - Solar (2 MW) - 0,1 %
  - Wind - 17,5%
  - Biomass – 23,6 %.



# Energy Policy

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The main approaches to the energy policy are directed at increasing security of energy supply of the country:

- by encouraging diversification of supplies of the primary energy resources,
- by creating conditions for increasing subsistence of electric energy generation,
- by preventing isolation of the regional electric energy market through new interconnections.

Creation of competition conditions for promoting the use of renewable and local energy resources and environmental protection also plays a substantial role.





## Priorities of the Energy Policy

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The main priorities of the policy-planning document "*Guidelines for Development of Energy Sector for 2007-2016*" are:

- to ensure **security of supply** in the country;
- to increase **self sufficiency** and facilitate **diversity of supplies** as well as **reducing dependency** of external suppliers of primary energy resources;
- to increase **effective use of renewable sources** of energy and **energy production in cogeneration** (CHP) processes;



## RES advantages in the Latvian energy balance

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In 2012, the RES share in the Latvian final energy consumption reached 32.6%.

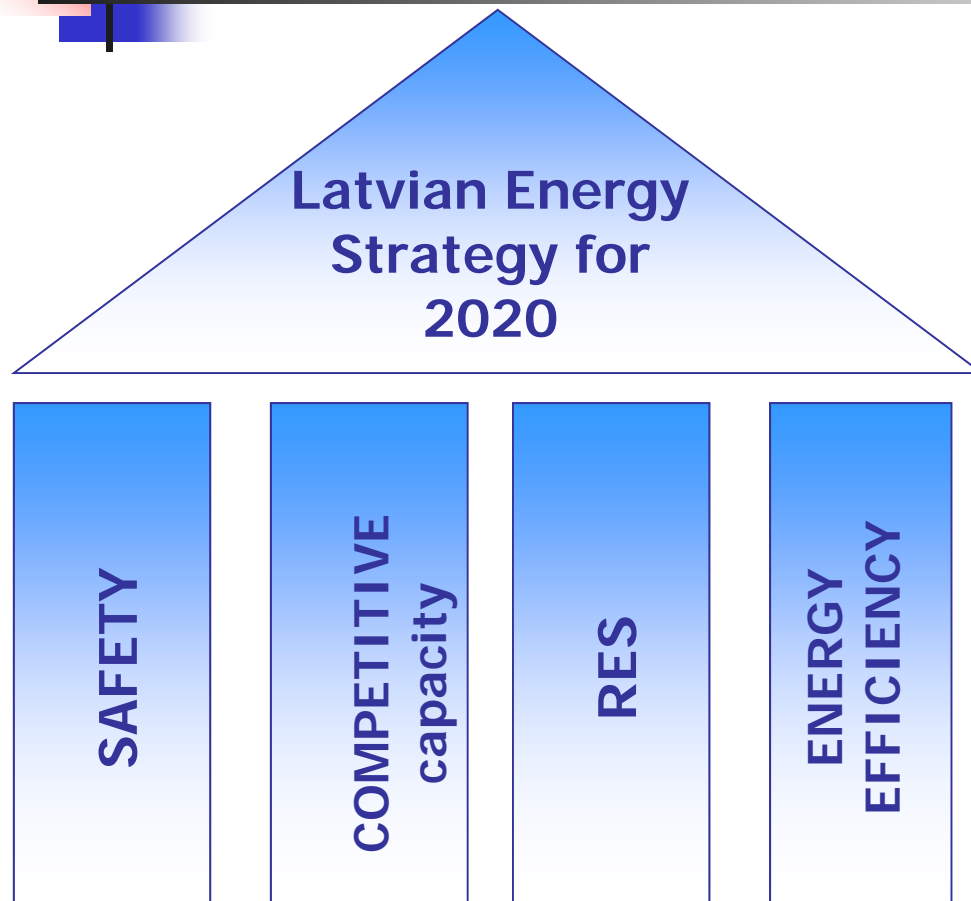
The *RES share* in energy consumption:

- for heating was 45-50%,
- for district heating – 18%, and
- for electricity production – > 40%.



# Latvian energy strategy for 2020

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It is vital importance to increase the Latvian energy independence.

Therefore, it is obligatory that the state Energy Strategy for 2020 includes the RES development.



## Objectives of the strategy for RES promotion:

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- Increase of the RES share in the energy mix (mainly in the heating and transport sectors).
- Introduction of sustainable support mechanisms for RES.
- Priority for economically attractive technical solutions.
- Promotion of RES and related technologies by raising investments.
- Development of a sustainable and cost-based support mechanism for the RES use.
- Achievement of the 40% RES share in the final energy consumption by the year 2020.



## Electricity supply

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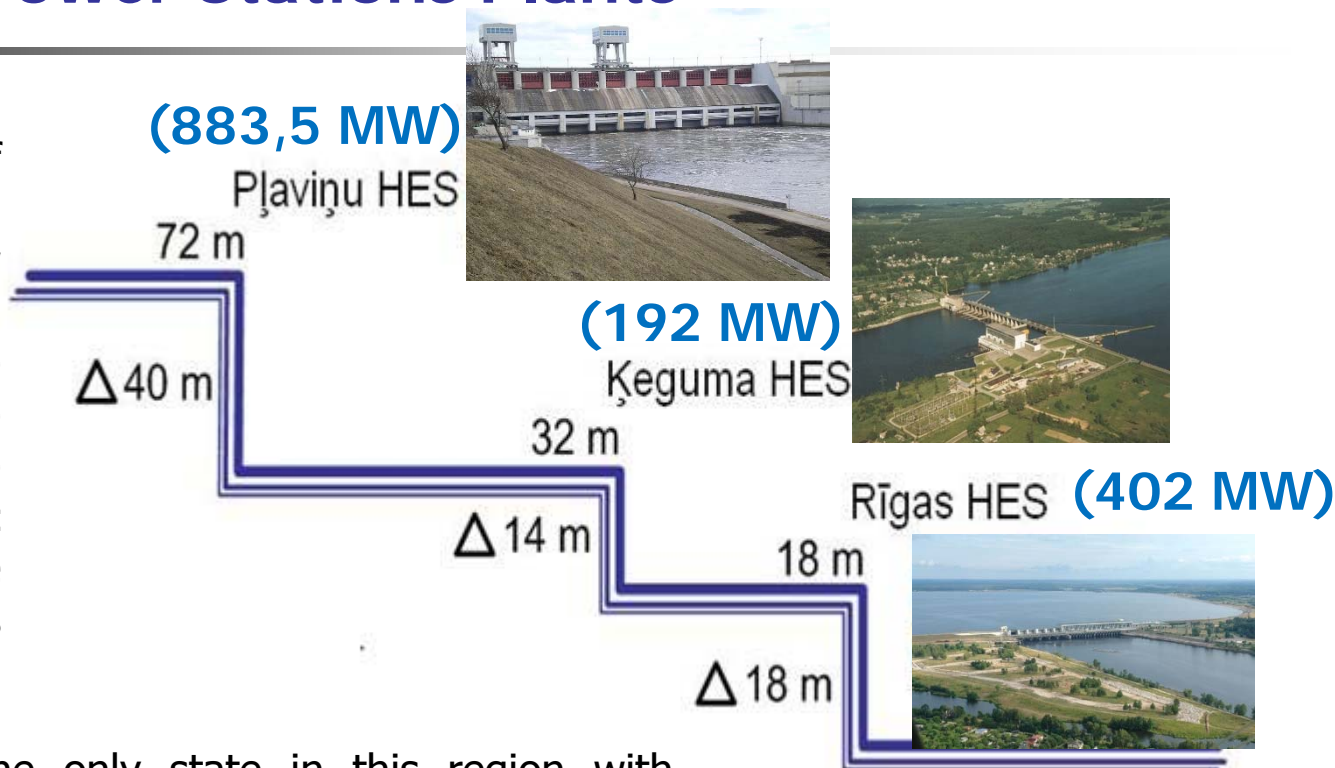
A part of electricity is generated by Latvian HPPs, CHPs, biogas and wind power plants, whereas the rest is imported. Mainly the imported fuels – natural gas and heavy fuel oil and local fuels – firewood – are used in heat energy generation.

Power transmission network in Latvia is extensive. The main grid consists of 330 kV and 110 kV lines and substations (5260 km). Distribution network basically consists of 20 kV and 0.4 kV lines, while 6-10kV actually is for cable network. Total length of the network is 94,701 km.

# Electricity production Hydro Power Stations Plants

The volume of electricity generation depends on the flow rate in the Daugava River. After closing the Ignalina NPP at the end of 2009, the situation in the electric energy market in the Baltic States has changed.

Latvia is no longer the only state in this region with insufficient amount of electric energy generated in its power plants. At the moment, Lithuania is also importing electric energy. Therefore, basically the suppliers from Estonia and Russia compete for supplying electric energy to Latvia.



# Electricity supply network in Latvia and neighbouring countries





## Electricity market

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More than 90% of electric energy generated in Latvia is generated by the JSC "Latvenergo", which also ensures electric energy imports and supply to the consumers.

Currently, 46 traders have received licenses for electric energy trade. At the moment six traders are operating actively in the electric energy market having signed contract on use of the system with JSC «Sadales tīkls».





## Power generation

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In 2012, the JSC "Latvenergo" generated 68% of the total electricity supply (6448 GWh), it purchased 15% from small electricity energy producers and net imports of electric energy constituted 17%. Compared to the previous year, the total electric energy supply has increased by 1.6 percent.

In 2012, 2340 GWh of electricity was produced by high efficiency cogeneration. The existing heat energy production plants are gradually replaced with efficient cogeneration plants using local energy resources. Their replacement and efficient use of energy resources greatly contribute to the reduction of greenhouse gas emissions.



## Electricity supply in Latvia, TWh

	2005	2010	2011	2012
Total electricity supply	7,1	7,5	7,3	7,5 / 100 %
Gross electricity generation including:	4,9	6,6	6,1	6,2 / 83 %
from renewable energy resources:	3,4	3,6	3,1	4,1 / 55 %
large HPPs*	3,3	3,6	2,8	3,6
small HPPs	0,1	0,1	0,1	0,1
biomass and biogas power stations	0,0	0,1	0,1	0,3
wind power stations	0,1	0,1	0,1	0,1
From fossil energy resources	1,5	3,0	3,0	2,1 / 28 %
large CHPs**	1,3	2,4	2,4	1,4
other CHPs	0,2	0,6	0,6	0,7
Net electricity import	2,2	0,9	1,3	1,3 / 17 %

\*Daugava cascade - Riga HPP, Kegums HPP, Plavinas HPP; \*\*Riga CHP-1 and Riga CHP-2



## Cogeneration

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Riga CHP-1:  
(144 MWel,  
493 MWth)

Latvia heat supply system is based on municipal heat utilities. Heat energy which is produced in cogeneration cycle is up to 50% from the total heat energy production in the district heating or 15% from the total heat energy which produced in Latvia.

Heat energy for district heating is produced in Combined Heat and Power Plants (CHP) (Riga CHP1 and Riga CHP2 – these plants produced 33% of the total district heat production) in a certain number of cogeneration plants, district boiler houses and boiler houses of industries.



Riga CHP-2:  
(662 MWel,  
1347 MWth)



## Heat supply (I)

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In 2012, 1.2% of the total generated heat energy has been supplied to the industrial sector, 72.0% – to households, 26.8% – to other consumers.

The breakdown of heat energy distributed by regions is the following:

- Riga region – 51.7%,
- Pieriga region – 11.6%,
- Vidzeme – 6.1%,
- Kurzeme – 10.5%,
- Zemgale – 8.1%,
- Latgale – 12%.



## Heat supply (II)

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The heat energy for sale produced in 663 boiler houses and 132 cogeneration plants having generated 7.46 TWh.

In 2012, natural gas was the main resource for generation heat energy and power energy. The share of heat energy produced using:

- natural gas as fuel - 78.4%,
- woodchips – 14.2%,
- firewood – 2.2%,
- heavy fuel oil – 1.1%,
- other types of fuel – 4.1%.



## Natural Gas supply (I)

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Currently, the JSC "Latvijas Gāze", which from the year 1997 has the exclusive rights to carry out transmission, distribution, storage and trade of natural gas, is the only enterprise operating in the Latvian natural gas market.

The natural gas consumption in 2012 was 1508 mln. m<sup>3</sup>. The biggest consumers of natural gas in 2012 were CHP and heat supply enterprises of the JSC "Latvenergo" – 63,9%, manufacturing enterprises – 15%, other consumers – 18,2%. Riga region consumes about 65% of natural gas utilised in Latvia.



## Natural Gas supply (II)

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The Latvian gas supply system is not connected to the European Union common gas supply system.

Latvia receives natural gas only from Russia, as most of gas is supplied to Latvia by the Russian enterprise JSC "Gazprom" and a small amount by the LLC "Itera Latvija" which is controlled by the JSC "Gazprom".

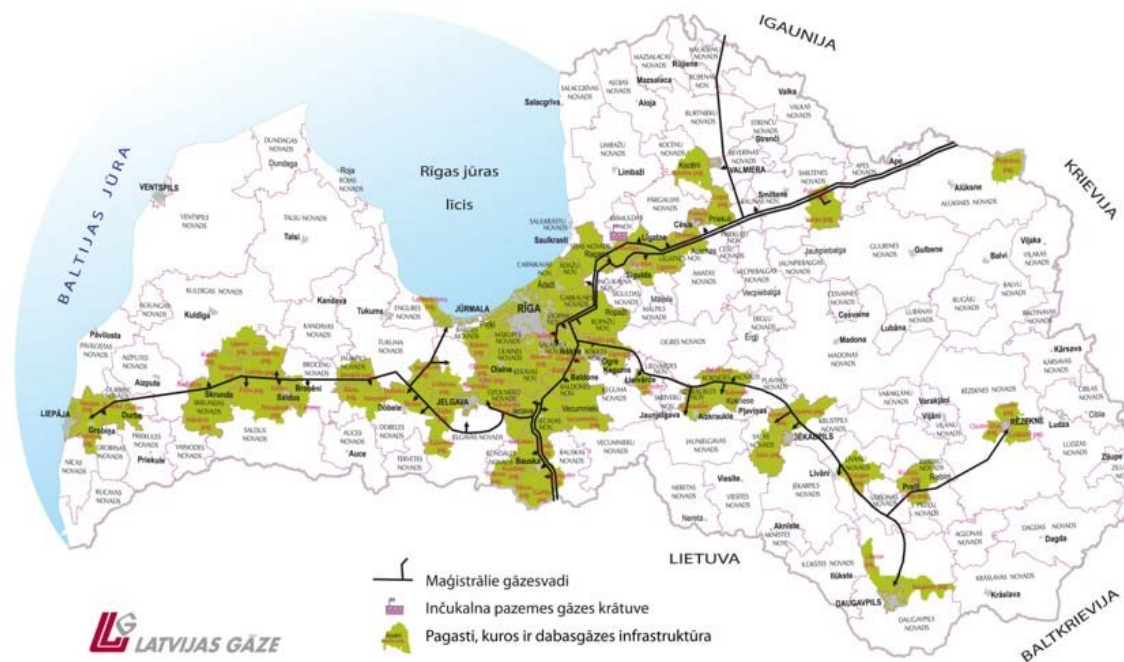
The gas supply business environment in the region and the effective gas supply agreements practically exclude third parties except a regional transmission system operator and access to Inčukalns underground gas storage. The capacity of the gas pipeline Valday-Pskov is not sufficient to ensure gas supply to the Baltic States and to the Northwest region of Russia during winter. Consequently, at the moment, the gas market in Latvia may only be open formally.

# Natural Gas distribution system

## Pagasti, kuros ir dabasgāzes infrastruktūra

dabasgāze

SĀKUMS LABAI ENERĢIJAI







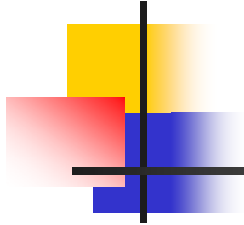


## Energy strategy for the year 2030

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The Energy Strategy 2030 sets the following objectives of the energy policy:

- Competitive economy – balanced, efficient, economically, socially, and ecologically justified energy policy based on market principles ensuring further development of the economy, its competitiveness in the region and world;
- Sustainable energy – reduced dependency on imported energy resources, new and efficient technologies for the use of renewable resources are encouraged, measures to improve energy efficiency are implemented;
- Secure supply – stable energy supply and developed infrastructure provided to energy users.



**Thank you very much for your attention!**

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