

Republic of Latvia
Cabinet
Order No. 129
Adopted 9 February 2016

On the Energy Development Guidelines for 2016-2020

1. To support the Energy Development Guidelines for 2016–2020 (hereinafter – the Guidelines).
2. To determine the Ministry of Economics as the institution responsible for the implementation of the Guidelines, and the Ministry of Finance, the Ministry of the Interior, the Ministry of Education and Science, the Ministry of Transport, the Ministry of Agriculture, and the Ministry of Environmental Protection and Regional Development as the co-responsible institutions.
3. For the institutions involved in the implementation of the Guidelines to submit a report to the Ministry of Economics on the results of the implementation of the activities provided for in the Guidelines until 1 December 2017 and 1 December 2020.
4. For the Minister for Economics to submit the informative report to the Cabinet:
 - 4.1. until 1 October 2018 – on the implementation of the Guidelines in 2016–2017;
 - 4.2. until 1 October 2021 – on the implementation of the Guidelines in 2018–2020.
5. For the institutions involved in the implementation of the Guidelines to ensure the implementation of the measures included in the Guidelines in 2016 within the limit of the funds granted from the State budget. To examine the issue of granting additional funds from the State budget for 2017 and subsequent years during the preparation process of the draft law On the State Budget for 2017 and the draft law On the Medium-term Framework of the Budget for 2017, 2018, 2019, together with applications of the new policy initiatives of all ministries and other central State institutions, considering the financial possibilities of the State budget.
6. To repeal the Cabinet Order No. 571 of 1 August 2006, On the Energy Development Guidelines for 2007–2016 (*Latvijas Vēstnesis*, 2006, No. 122).

Prime Minister

Laimdota Straujuma

Minister for Economics

Dana Reizniece-Ozola

ENERGY DEVELOPMENT GUIDELINES for 2016-2020

(Informative Part)

Ministry of Economics
Riga, 2016

CONTENTS

Introduction

1. Targets of the Energy Policy
 - 1.1. Targets of the EU Energy Policy
 - 1.2. Long-term Targets of the Energy Policy of Latvia
 - 1.3. Policy Results to be Achieved and Their Performance Indicators
2. Core Principles of the Energy Policy
3. General Characterisation and Development Trends of the Energy Sector
 - 3.1. Primary Energy Resources
 - 3.1.1. Renewable Energy Resources
 - 3.1.2. Fossil Energy Resources
 - 3.1.3. Other Energy Resources
 - 3.2. Establishment of the Internal Energy Market
 - 3.2.1. Electricity Market
 - 3.2.2. Natural Gas Market
 - 3.3. Energy Infrastructure
 - 3.3.1. Electricity Infrastructure
 - 3.3.2. Natural Gas Infrastructure
 - 3.3.3. Transport Charging/Fuelling Infrastructure
 - 3.4. Heating Supply
 - 3.5. Renewable Energy Sources
 - 3.6. Energy Efficiency
 - 3.7. Management of Crisis Situations
 - 3.8. Innovative Solutions in the Energy Sector
 - 3.9. Strengthening of International and Regional Cooperation
4. SWOT Analysis
 - 4.1. Electricity
 - 4.2. Natural Gas
 - 4.3. Heating Supply
 - 4.4. Energy Efficiency
 - 4.5. Most Significant Problems to be Solved
5. Planning of Subsequent Actions
6. Impact of the Policy on the State and Local Government Budget

List of Abbreviations Used

ACER	Agency for the Cooperation of Energy Regulators
RES	Renewable Energy Sources
USA	United States of America
BEMIP	Baltic Energy Market Interconnection Plan (regional cooperation and coordination with the countries around the Baltic Sea)
BRELL	Treaty entered into by and between the transmission system operators of Belarus, Russia, Estonia, Latvia and Lithuania
CEF	Connecting Europe Facility
CSB	Central Statistical Bureau of the Republic of Latvia
MoE	Ministry of Economics
ERDF	European Regional Development Fund
EU	European Union
ESCO	energy service company
ETS	Emissions Trading System
EUROSTAT	Statistical Office of the European Communities
MoF	Ministry of Finance
GIPL	Gas Interconnector Poland-Lithuania
GDP	Gross domestic product
IRENA	International Renewable Energy Agency
PCI	Projects of common interest
Cabinet	Cabinet
NDP2020	National Development Plan 2014-2020
NPS	Power spot trading Nord Pool Spot
NGO	Non-governmental organisations
OECD	Organisation for Economic Co-operation and Development
MP	Mandatory procurement
MPC	Mandatory procurement component
UGSF	Underground gas storage facility
TSO	Transmission system operator
SAIDI	Duration of electricity supply interruptions per 1 client a year
SAIFI	Frequency of electricity supply interruptions per 1 client a year
LNG	Liquefied natural gas
IEA	International Energy Agency
GHG	Greenhouse gases
SET	Subsidised energy tax
PUC	Public Utilities Commission
SWOT	Strengths and weaknesses, opportunities and threats

Units of measurement:

GWh	Gigawatt hour
ha	Hectare
J	Joule
kW	Kilowatt
kWh	Kilowatt hour
kV	Kilovolt
Mtoe	Millions of tons of oil equivalent
MW _{el}	Electric power in megawatts
MW	Megawatt
MWh	Megawatt-hour
m ²	Square metre
m ³	Cubic metre
PJ	Peta-joule
TWh	Terawatt-hour
V	Volt
W	Watt

Introduction

The Energy Development Guidelines for 2016–2020 (hereinafter – the Guidelines) are a policy planning document which prescribes the core principles, targets, and action directions of the Latvian government policy in the energy sector for the time period from 2016 to 2020. Their objective is to define a strategy for a competitive, safe, and sustainable energy policy, concurrently outlining the long-term trends for the development of the sector in all fields of the energy sector.

On 28 May 2013, the Cabinet (hereinafter – the Cabinet) noted the informative report “Long-term Strategy of the Energy Sector of Latvia 2030 – Competitive Energy Sector for the Society”¹ (hereinafter – the Energy Strategy 2030), assigning the Ministry of Economics (hereinafter – the MoE) to develop the energy policy guidelines for the period up to 2020 and to submit them to the Cabinet for examination.

During development of the Energy Policy Guidelines the informative report “On the financing of the Energy Policy within the Period from 2014 to 2020”² was prepared which was examined at the Cabinet meeting of 20 May 2014.

The Guidelines were developed based on the competence of the MoE laid down in Sub-paragraph 5.3 of the Cabinet Regulation No. 271 of 23 March 2010, By-laws of the Ministry of Economics, to develop and implement policy in specific sectors of national economy, including the energy sector, and based on the laws and regulations governing the drawing up of development planning documents which lay down the information to be included in the content of the Guidelines and the structure of the document, as well as the outlined tasks and the measures to be implemented for their fulfilment.

The Guidelines also provide detailed settings of the NDP2020 energy policy, as well as targets of the recommendation of the Council of the European Union (hereinafter – the EU) for the 2014 National Reform Programme of Latvia (see Annex 2).

There are several other factors which justify the necessity for the development of the Guidelines. In 2016, the applicable Energy Development Guidelines for 2007–2016 have partially lost their topicality, as well as several planning documents for the period up to 2020 are in effect which also include energy issues. During the period of operation of the Energy

Guidelines for 2007–2016 new national development planning documents which are higher in hierarchy have been adopted (Sustainable Development Strategy of Latvia up to 2030, NDP2020), the situation in strategic planning of the electricity sector of Latvia and Baltic has changed, and the range of energy policy introduction instruments has been reviewed.

On 23 October 2014, the draft Guidelines developed by the MoE were handed over for public discussion and posted on the website of the MoE (https://em.gov.lv/lv/par_ministriju_sabiedribas_lidzdaliba/diskusijai_nodotie_dokumenti/), fulfilling the obligation specified in Sub-paragraph 10.2 of the Cabinet Regulation No. 970 of 25 August 2009, Procedures for Public Participation in the Development Planning Process, (hereinafter – Cabinet Regulation No. 970) to ensure public access to the documents to be discussed throughout the period of public discussion. Upon fulfilling that referred to in Sub-paragraph 10.1 of Cabinet Regulation No. 970, the time period for public discussion of the draft Guidelines during which public representatives provided proposals was at least 30 days before the announcement of the draft Guidelines in the meeting of State Secretaries.

In addition to the public discussion on the website of the MoE, a meeting for discussion of the draft Guidelines with participation of the sectoral and public representatives was organised at the MoE on 22 November 2014 and at the Energy Sub-committee of the National Economy Council on 24 November. Apart from the abovementioned meetings also several meetings with representatives of individual sectors took place in order to discuss the issues to be addressed in the draft Guidelines. The proposals submitted by sectoral representatives prior and after announcement of the draft Guidelines in the meeting of State Secretaries were evaluated and the draft Guidelines were updated.

During the preparation of the Guidelines, in accordance with the procedures laid down in the law On Environmental Impact Assessment, in order to assess the potential environmental impact and to involve the public in discussing the document and decision-making, as well as to draft proposals in order to prevent or reduce the potential negative impact on human health and environment, a strategic environmental impact assessment was carried out.

1. Targets of the Energy Policy

1.1. Targets of the EU Energy Policy

In accordance with Article 4 of the Treaty on the Functioning of the European Union, energy is one of the fields in which the EU and Member States have a shared competence.

The EU must reach the following climate and energy policy targets by 2020 which were brought forward in the European Council of 8/9 March 2007³:

- to achieve at least a 20 % reduction of GHG emissions by 2020 compared to 1990 level;
- to increase the share of renewable energies in energy consumption up to 20 %;
- to increase energy efficiency by 20 %.

For the EU to achieve the target specified in the Roadmap⁴ in 2050 for transition to a competitive low-carbon economy – to reduce GHG emissions by 80–95 % and to provide clarity to investors about the development of both policies after 2020, the European Council of 23/24 October 2014 took a decision⁵ **on climate and energy targets for the time period from 2020 to 2030**, and they are as follows:

– to achieve at least a 40 % reduction of GHG emissions compared to 1990 level.

The EU Member States must jointly reach the abovementioned target in a more cost-effective manner, providing that a reduction in the following amounts is achieved by 2030 compared to 2005:

- in the amount of 43 % in the sectors belonging to the Emissions Trading System (hereinafter – the ETS), and
- in the amount of 30 % for non-ETS⁶ sectors.

The target of the ETS has been jointly specified for all EU Member States – individual targets and freedom of choice for their achievement (reduce emissions or acquire emission quotas) has been specified for all participants, but the target for GHG emissions of non-ETS sectors will be specified for each Member State individually (at the national level with a binding target), re-distributing the liabilities for reducing emissions;

- to increase the share of renewable energies in the total energy consumption by at least 27 %. This target is binding at the EU level which means that Member States will have the right to determine the national level targets themselves;

- to increase the energy efficiency target by at least 27 % compared to the estimates of future energy consumption. This target is indicative at the EU level. A review clause of the target has been indicated in the conclusions of the European Council, determining that targets may be reviewed and increased up to 30 % until 2020;

- prevention of inadequate interconnections between the gas and electricity networks of Member States, and also ensuring synchronous operation of Member States in European networks as foreseen in the European Energy Security Strategy will also remain a priority after 2020. Therefore, by 2030 it is expected to achieve at least the 15 % interconnection target. The 10 % interconnection target which had to be achieved by 2005 was already specified in the 2002 European Council, however, it still has not been achieved in separate Member States.

The establishment of the European Energy Union is one of the priorities of Jean-Claude Juncker, President of the EC, who became the President of the European Commission on 1 November 2014. It is related to reforms in the energy policy in the EU, emphasising the management of the energy policy. The reform has the following objectives:

- solidarity and trust to improve safety of energy supply for Member States through joint cooperation;

- coordination among Member States in the development of national energy policy;

- joint investments for Member States by coordinating investment programmes and their conditions;

- establishment of a functioning EU internal market providing that Member States will gradually reduce the protection of national markets from other Member States or will take decisions for the benefit of particular companies;

- coordination of the EU Member States prior to negotiations with the third countries.

The Energy Union is oriented towards diversification of energy sources, reduction of energy dependence of the EU Member States, the ability of the EU to change the direction and routes of flows of energy resources in case of necessity, as well as to increase the use of renewable energy sources (including local renewable energy sources) in the Energy Union.

1.2. Long-term Targets of the Energy Policy of Latvia

The energy policy of Latvia is directed towards ensuring further development of the economy of Latvia, and also the increase of its competitiveness in the region and the world, as well as public welfare and environmental quality.

The main objective of the energy policy of Latvia is to increase the competitiveness of national economy together with the implementation of other sectoral policies by facilitating the safety of supply, formation of energy resources and energy prices specified by the free market and competition, sustainable generation and consumption of energy with two targets of the energy policy:

- **improving the safety of energy supply** which provides for stable energy supply available to the consumers of energy by reducing geopolitical risks, diversifying the sources and routes of supply of energy resources, developing interconnections and the infrastructure of the national internal energy supply, introducing smart technologies in energy supply networks, forming reserves of energy resources, and participating in the improvement of the legal

framework. Long term optimisation of the costs of the safety of energy supply also requires regional cooperation:

- further integration into the networks of the EU and Scandinavian countries, achieving levelling of prices in the region;

- diversification of energy supply by solving issues of both electricity and gas infrastructure within the framework of the internal energy market at the EU level;

- **sustainable energy** which ensures sustainability of energy in economic, social, and environmental sense. This is planned to be achieved by improving the energy efficiency, introducing smart technologies, and promoting highly efficient generation technology and technologies for the use of renewable energy sources (hereinafter – the RES).

- In relation to the **renewable energies**, several targets have been laid down in Latvia for the time period until 2020:

- the share of the RES in gross final energy consumption in 2020 – 40 %, the target is binding, laid down in the RES Directive 2009/28/EC⁷ and in the national reform programme of Latvia “EU 2020”;

- the share of the RES in gross final energy consumption in the transport sector in 2020 – 10 %, the target is binding, laid down in the RES Directive 2009/28/EC and in the national reform programme of Latvia “EU 2020”;

- to reduce the GHG emissions per one unit of fuel or energy supplied until 2020 by 6 %.

- In relation to **energy efficiency**, several targets have been laid down in Latvia⁸ for the time period until 2020:

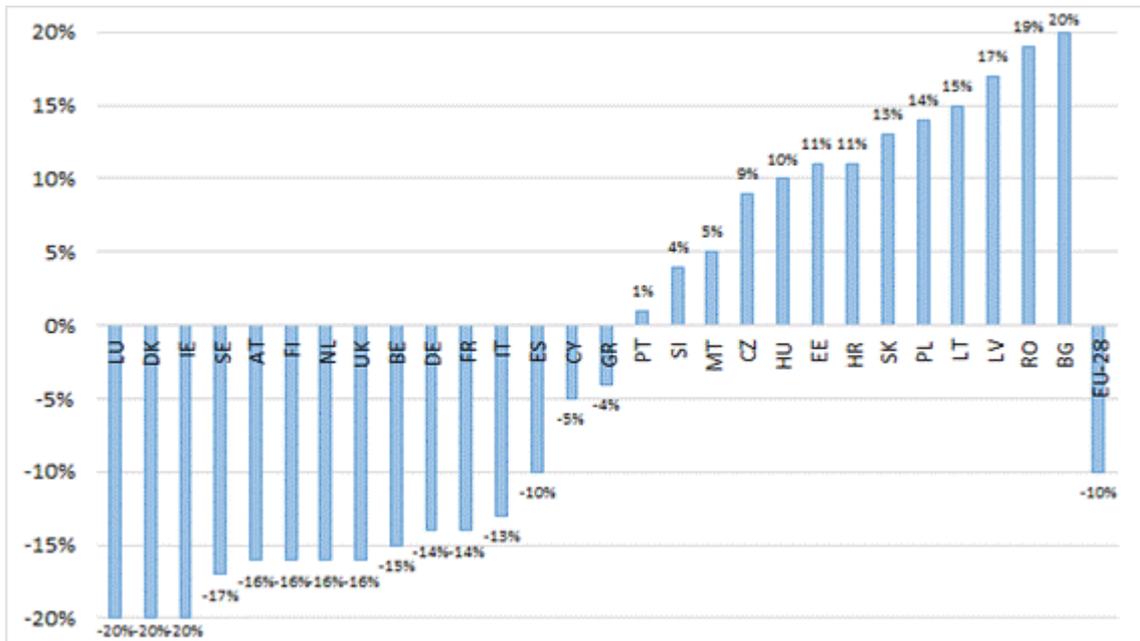
- savings of primary energy in 2020 – 0.670 Mtoe (28 PJ), the target is not binding, laid down in the national reform programme of Latvia “EU 2020”;

- mandatory national accumulated final energy savings until 2020 – 0.850 Mtoe, the target is binding, laid down in accordance with the Energy Efficiency Directive 2012/27/EU⁹;

- each year 3 % of the area of buildings of direct administration are renovated (maximum forecast – in total 678 460 m² renovated) – the target is binding, laid down in the Energy Efficiency Directive 2012/27/EU;

- to reduce the average consumption of thermal energy for heating (with climate correction) by 50 % compared to the consumption in 2009 (202 kWh/m²), the target of 150 kWh/m² per year must be achieved by 2020. The target is not binding, defined in the Energy Strategy for 2030.

- reduction of energy intensity from the oil equivalent of 372.9 kg per EUR 1000 of the GDP in 2010 to the oil equivalent of 280 kg per EUR 1000 euro of the GDP in 2020.



Source: Directorate-General for Climate Action of the European Commission

Figure 1. Non-ETS targets of the EU Member States for 2020¹⁰

- At the EU level **GHG emissions** must be reduced by 20 % until 2020 compared to the amount of emissions in 1990. Therefore, Latvia¹¹ has mandatory targets in the environmental sector which also concern energy in the most direct way:

- to restrict greenhouse gas emissions in non-ETS sectors in such a way that the increase would not exceed 17 % compared to 2005 (see comparison with other EU Member States in Figure 1);

- to restrict the total GHG emissions of the State so that they would not exceed 12.16 Mt of CO₂ equivalent in 2020.

1.3. Policy Results to be Achieved and Their Performance Indicators

In order to evaluate the progress in achieving the targets, the policy results to be achieved and their performance indicators have been laid down, and they are both binding and indicative at the level of the EU or Member States (see Table 1).

Table 1

Results of the Energy Policy of the EU and Latvia and their Performance Indicators

Policy result (performance indicator)	EU-27/EU-28		Latvia			
	Target value		Actual value		Indicative intermediate value	Target value
	2020	2030	Base value (year)	2013	2017	2020
Sustainable energy						
Action directions for achieving the target: <i>Diversification of primary energy resources, increase of the share of RES</i>						

1.1.	Share of the energy generated from RES in the final gross energy consumption (%)	20	27	34.3 (2009)	37.1	37	40
1.2.	Share of the energy generated from RES in the final gross energy consumption in transport (%)	10		1.35 (2005)	3.1	5	10
Action directions for achieving the target: 4. Efficient thermal energy market; 6. Improved energy efficiency							
1.3.	Increase in energy efficiency (%)	20	27				
1.4.	Primary energy savings (gross domestic energy consumption, Mtoe)			0.144 (2012)	0,160	n/a	0.670
1.5.	National mandatory accumulated final energy savings, Mtoe (GWh; PJ)			1161 (2012)	1896	3483	0.85 Mtoe (9897 GWh; 35.6 PJ)
1.6.	Each year 3 % of the area of buildings of direct administration is renovated (in total renovated, m ²)						678 460 m ²
1.7.	Specific consumption of thermal energy in buildings(kWh/m ² /year)			250 (2012)	230	160	150
1.8.	Energy consumption for the creation of domestic gross product (kg of oil equivalent per 1000 euros of the GDP)	280	<150	372.9	350	320	280
Increasing the safety of energy supply in the region							
Action directions for achieving the target Diversification of primary energy resources, Creation of an efficient energy market, Efficient energy infrastructure, Strengthening of international and regional cooperation							
2.1.	Connections of the infrastructure in the electricity market (capacity of interconnections compared to the installed generating capacity, %)	10%	15%		4% ¹²	n/a	10%
2.2.	Connections of the infrastructure in the gas market Integration in the EU networks, possibilities to			1	1	≥ 1	≥ 1

	procure natural gas from different sources (<i>number of sources</i>)						
2.3.	Energy dependence – net import of energy resources/gross domestic energy consumption plus bunkering (%)	n/a	n/a	41.6 (2010)	42.4 (2014)	43.2	44.1

2. Core Principles of the Energy Policy

The future energy policy will be created on the basis of the following core principles:

- integration of the EU climate and energy policy targets into the national policy;
- regional cooperation with Estonia and Lithuania and other countries around the Baltic Sea (Baltic Energy Market Interconnection Plan (hereinafter – the BEMIP)) (see Sub-section 3.9) in order to ensure coordinated development and implementation of the energy policy in the region;
- competitive energy price which is based on the principles of operation of the market and respects interaction between different sectors;
- safety of energy supply which is the basis for taking each decision so that the provision of energy resources would be sufficient for national economy, including households;
- improvement of safety and quality of energy supply as the basis for restoring and developing the existing infrastructure with the objective of promoting the competitiveness of national economy;
- efficient use of resources, including cost effectiveness is promoted at all stages of energy generation, transformation, transportation, and use;
- equal conditions of competition for individual groups of producers or suppliers;
- availability of energy to consumers with a comparatively low level of income;
- availability of information regarding the measures that ensure implementation of the energy policy;
- introduction of innovative solutions, including smart technologies;
- being conscious of environmental protection and climate change problems, sustainable policy oriented towards reduction of GHG emissions;
- energy efficiency as one of the main policy instruments which allows to reduce costs and, by reducing the energy consumption, increases the safety level of energy supply;
- efficient use of renewable energy sources in all sectors, including transport.

3. General Characterisation and Development Trends of the Energy Sector

3.1. Primary Energy Resources

The dependence of Europe on imported energy resources keeps increasing. According to the forecasts of the International Energy Agency (hereinafter – the IEA) more than 80 % of the consumed oil and gas will be imported in 2035. The global energy consumption in 2035 could increase by more than a third where China, India, and Middle Eastern countries will consume more than 60 % of the forecasted increase.

The price variations of electricity in the global market are significantly affected by the prices of fossil energy. For example, shale gas revolution in the United States of America (hereinafter – the USA) ensures certain advantages to energy-intensive industrial producers of the USA in comparison to the EU producers. In 2012, the gas price for industrial producers in the USA was four times lower than for the EU producers. Within seven years (2005–2012) the industrial price index determined by the IEA for the actual price of electricity increased by 37 %

for the European members states in the Organisation for Economic Co-operation and Development (hereinafter – the OECD) (see Annex 1), while it decreased by 4 % in the USA. Shale gas revolution in the USA also prompted more intense use of black coal in the EU, because otherwise the competitiveness of the EU would decrease. Latvia mostly uses imported energy resources. In 2013 local energy resources ensured 34.9 % from the total consumption of primary energy resources. Majority of them were RES – wood biomass, hydro-resources, wind, biogas, biofuels, and local energy resources – peat, waste. The remaining part or 65.1 % of energy resources among which oil products and natural gas are the most important were imported from different countries of the Baltic region, EU, and the third countries, including from Russia. Natural gas was supplied only from Russia, which represented 26.9 % (50.27 PJ) (see Figure 2).

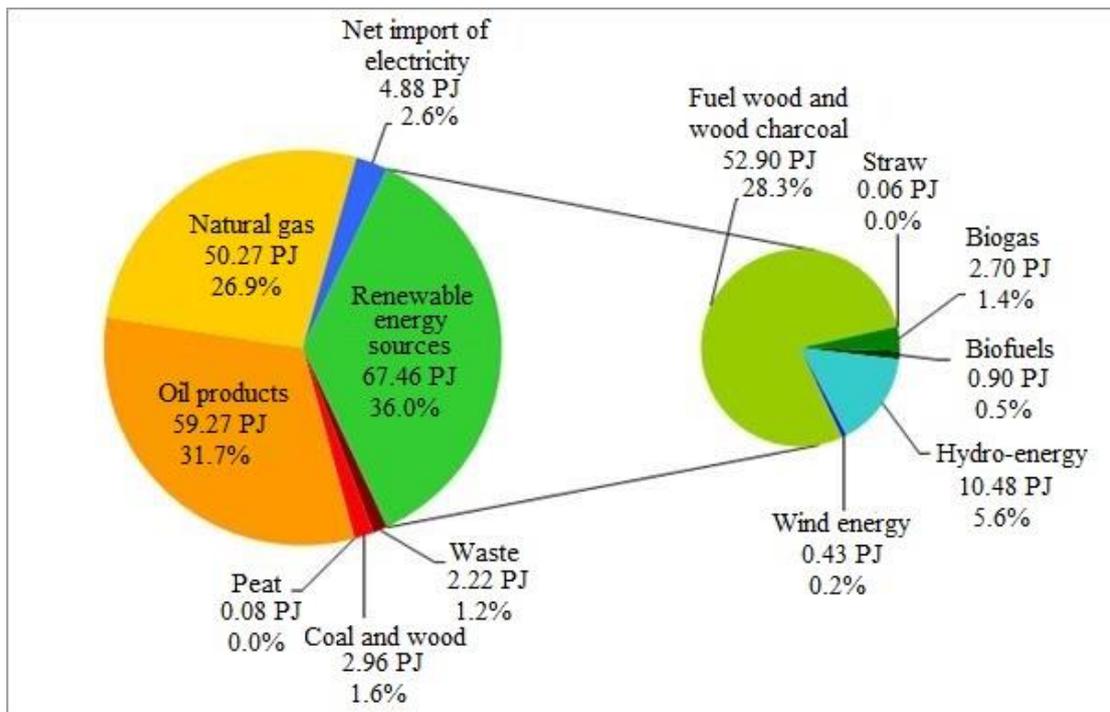


Source: The External Trade database of the Statistical Office of the European Union (hereinafter – EUROSTAT) was used in estimates.

* Commonwealth of Independent States

Figure 2. Flow of primary energy sources in Latvia in 2013

Renewable energy sources, oil products and natural gas prevail in the structure of the primary energy resources of Latvia (see Figure 3). Contrary to individual EU countries, the consumption of black coal keeps decreasing in Latvia, and in 2013 it amounted to only 121 thousand tonnes. Significant changes in the structure of primary energy resources are not planned in the time period until 2020.



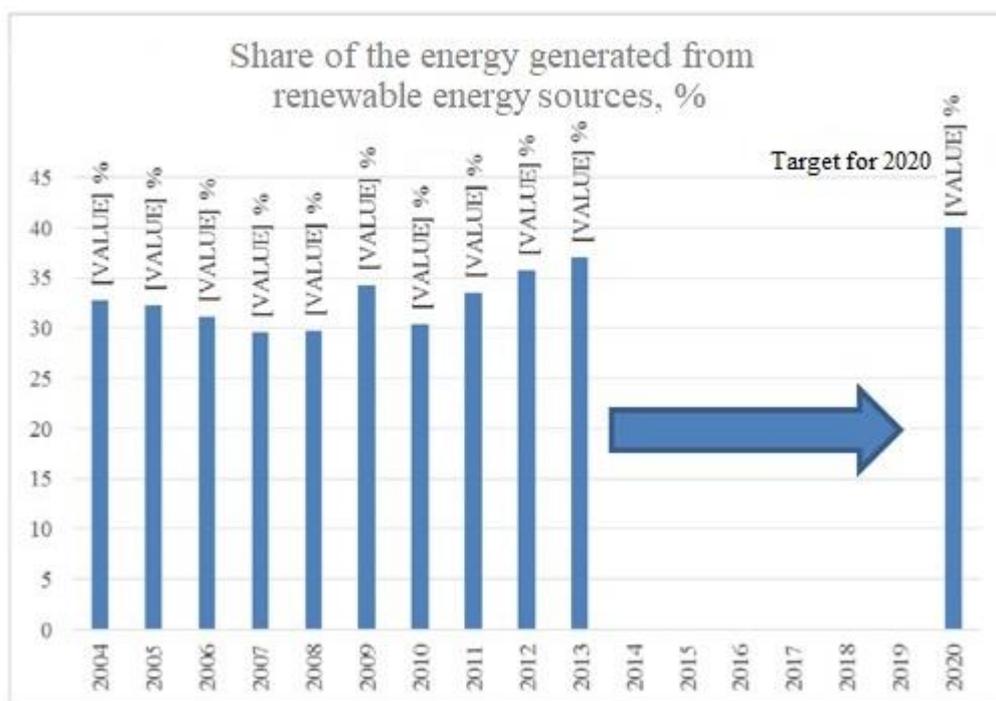
Source: Central Statistical Bureau of the Republic of Latvia (hereinafter – the CSB)

Figure 3. Structure of the consumption of the primary energy resources of Latvia in 2013 (by the types of energy resources), PJ and %

3.1.1. Renewable Energy Sources

The actual share of RES in the total consumption of primary energy resources keeps slowly rising (see Figure 4). It is expected that by 2020 it will reach the target laid down in the RES Directive 2009/28/EC – 40 %.

In Latvia, the most important RES are **wood biomass and hydro-energy**. Wood biomass is the most important local fuel which in Latvia is used for the centralised and local heating supply, as well as in co-generation. In the last five years, the total consumption of fuelwood has been constantly rising. 6477 m³ solid (45.65 PJ) of fuelwood were consumed in 2010, 6677 m³ solid (46.90 PJ) – in 2011, 7314 m³ solid (52.50 PJ) – in 2012, 7327 m³ solid (53.11 PJ) – in 2013, and 7668 m³ solid (55.92 PJ) in 2014. Its share in the balance sheet of the primary energy resources of Latvia of 2014 amounted to 30 % of the total consumption of primary energy resources. It is expected that the consumption of biomass will continue to rise in the energy sector.



Source: EUROSTAT

Figure 4. Actual share of RES in the total consumption of primary energy resources¹³

In terms of cost-effectiveness, **hydro-energy¹⁴** is characterised by the comparatively lowest amount of capital investments per generated quantity of energy. Latvia has suitable conditions for the use of hydro-energy, and individual hydroelectric power plants in combination with accumulation of energy in water reservoirs with flexible generation possibilities from fossil or biogas energy resources may be used also as base electric power plants.

Considering the development of modern and environment-friendly technologies, the use of hydro-energy resources in all rivers should be based only on nature-friendly methods related to conservation of the environment. This principle should also be applied to all operated hydroelectric power plants. For it to be implemented, it is necessary to review the conditions and rates for the application of the natural resources tax for all hydroelectric power plants.

Theoretical hydro-energy resources of the medium and small rivers of Latvia are 900 GWh of electricity per year, without using River Venta, River Lielupe, and the middle and lower sections of River Gauja. The hydro-energy resources of small rivers that can be practically used are estimated to be within the borders of 250–300 GWh of electricity per year. Hitherto only 70 GWh have been mastered, that is 23–28 % of the potential power of the former water mills and former small HPPs. Taking into account the legal framework currently in force¹⁵, it is prohibited to build and restore hydroelectric power plants on specific rivers and river sections. In relation to the other rivers and river sections which are not included in the abovementioned legal framework, it is necessary to receive the documentation necessary for construction and to perform the necessary environmental protection procedures to construct new hydroelectric power plants.

The quantity of electricity output in Latvia depends on the flow of River Daugava. Cascade on River Daugava – Rīga HPP, Ķegums HPP, and Pļaviņas HPP ensures on average 40 % of the electricity consumed in Latvia. In concern for efficient use of water resources and environmentally safe economic activity, hydro-aggregates of Rīga HPP on River Daugava are being gradually restored. The main objective of reconstruction projects is to replace the outdated hydraulic turbines in order to ensure safe, efficient, continuous, and competitive operation of Rīga HPP on River Daugava in the common energy supply system. As

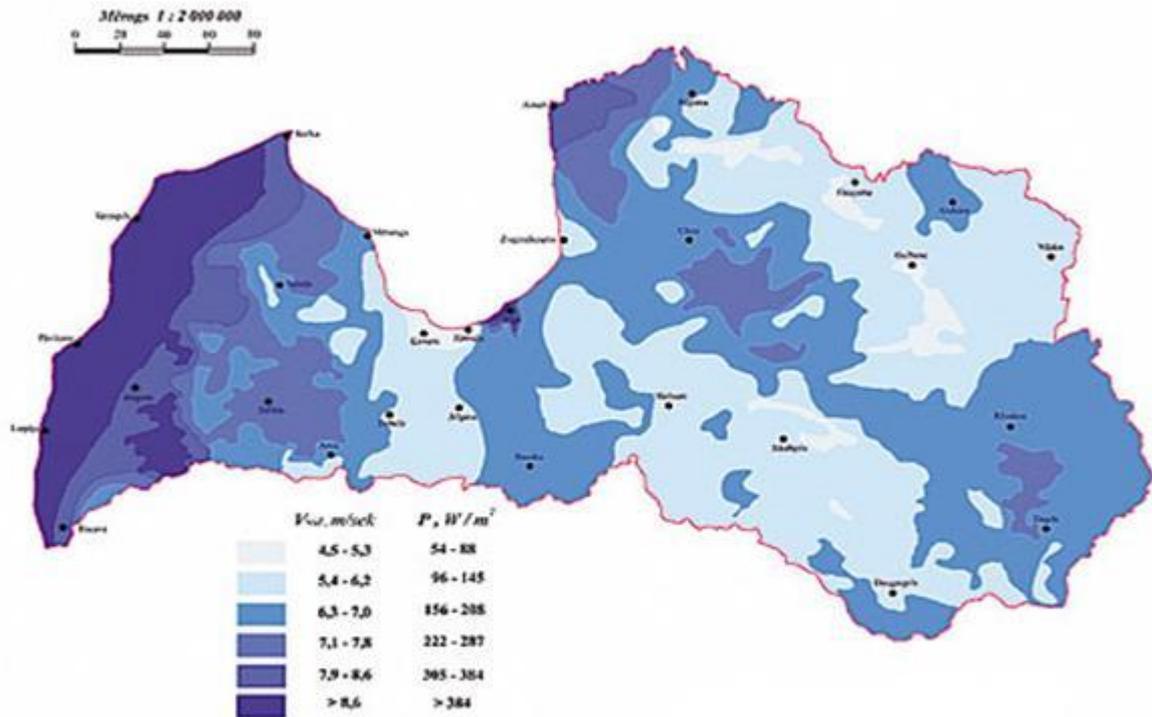
a result of reconstruction the operational parameters of hydraulic turbines, such as installed capacity and efficiency coefficients, will be improved, thus increasing the output of electricity in a year. In total twelve of the twenty three hydro-aggregates of Rīga HPP on River Daugava were modernised in 2015. At the end of 2013 a contract on the replacement of two hydro-aggregates in Pļaviņas HPP was entered into, but at the beginning of 2014 – on the reconstruction of three hydro-aggregates in Ķegums HPP. The reconstruction process of all 11 hydro-aggregates that have not been reconstructed by now is planned to be completed in 2022, and it is estimated that the total restoration costs might exceed 200 million euros. In 2014, the total investments in the assets of Rīga HPP on River Daugava were 20.4 million euros of which 9.9 million euros were invested in the programme for the restoration of hydro-aggregates of Rīga HPP on River Daugava and 8.1 million euros were invested in implementation of various projects for the safety of hydroelectric structures.

In relation to the potential threats in the sector, floods in the river Daugava near Pļaviņas HPP may endanger the hydrostructure itself, as well as tear the sluices of Rīga HPP and Ķegums HPP. Consequently, damage would be caused throughout the lower reaches of River Daugava up to the sea. Solutions for reducing such threats should be evaluated after 2020.

Whereas **the division of wind energy resources in Latvia** is distinctly uneven (see Figure 5). Areas with different average annual intervals of wind speed – from 2.8 m/s up to more than 5.4 m/s – are marked in the wind atlas of Latvia. Wind turbines start to generate energy when the wind speed reaches 2.5 m/s.

Only those regions of the inner part of the territory of Latvia where wind forms due to elevations are favourable to the wind energy. The region of Latvia that has the highest wind speed is the coast of the Baltic Sea and the western coast of the Gulf of Riga, its northern part. Wind speed in these areas is from 5.1 to 5.8 m/s.

The wind potential in the inner part of the territory of Latvia is up to 1.5 TWh (rationally obtainable electricity per year). The forecast of transmission system operators (hereinafter – the TSO) shows that the potential of wind energy in the deep sea might reach 95 MWh. In 2014, the total installed electric power in wind parks of Latvia was 69 MW (from them support within the framework of the mandatory procurement (hereinafter – the MP) was received by 53 wind parks with the total installed power 58.3 MW) and potentially two projects of wind parks with the total electric power of 73 MW could be implemented.



Source: <http://www.windenergy.lv>

Figure 5. Wind atlas of Latvia (average wind speed per year at 100 m height)

In Latvia **solar energy** as a resource for the generation of electricity or thermal energy has been used in a restricted manner, as the high technological costs¹⁶ have hitherto hindered full use of the existing resource. In 2013, the renewable energies generated from sun amounted to less than one per cent in the balance sheet of renewable energy sources of Latvia, regardless of the fact that globally solar energy technologies are considered one of the most significant energy sources¹⁷ of the future. As the possibilities for the storage of renewable energies are developing, significant attention should be paid to the energy accumulation and stocking solutions, as well as to the combination of solar energy technologies with other renewable energy sources. Such approach ensures sustainable energy supply and enables optimal use of the available solar radiation potential.

The main **geothermal resources** of the territory of Latvia are related to ground waters the temperature of which exceeds 30 °C, and to basement hot rock. The possibilities for the use of geothermal waters are related to geothermal anomalies of Eleja and Southern Latvia where temperature exceeds 57 °C on the basement in Eleja District and 50 °C to 65 °C in the coast area of the Baltic Sea.

From 1993 to 1996 Latvia and Lithuania implemented a project under management of a Danish undertaking *Petroleum Geology Investigators* within the framework of which an assessment of the potential of geothermal energy in Latvia was carried out. In Devonian and Cambrian layers it was estimated to amount to 65 000 PJ, equating to 1.6 billion toe. Based on the calculations made within the research, if hot waters would be extracted in the territory of Latvia, the total capacity of thermal plants could be starting from 175 MW¹⁸.

The use of geothermal energy is a perspective direction in Latvia as the use of geothermal energy in heating technologies of high efficiency allows to reduce the CO₂ emissions, allowing to partially refrain from the use of fossil fuel and increase the independence from imported fuel. However, currently one of the most substantial restrictions for the use of

geothermal energy in Latvia is the relatively large investments that are necessary for the introduction of new technological solutions in Latvia.

3.1.2. Fossil Energy Resources

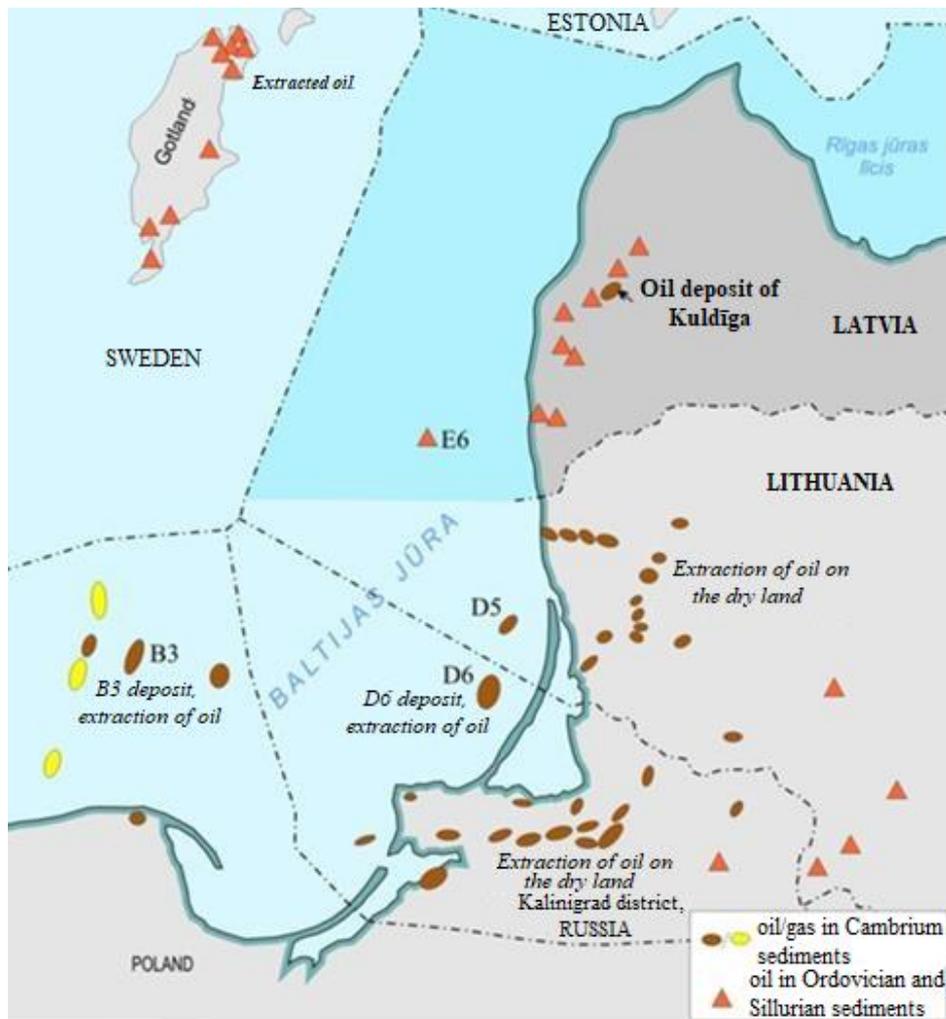
Latvia has a potential for the extraction of hydrocarbons (see Figure 6). In total approximately 35 hydrocarbon deposits, including one oil deposit (Kuldīga) has been discovered in Latvia both on dry land and also in internal maritime waters, territorial sea and exclusive economic zone of the Republic of Latvia. Moreover, oil manifestations (signs) in rock pores or cracks were observed in oil search and exploration drills. Experimental extraction of hydrocarbons is taking place in once licence field on dry land. At the same time significant changes in the energy balance sheet of Latvia are not expected to be made until 2020.

The southern part of the shelf of Latvia with the lowest degree of geological risk, i.e., the possibilities of discovering the foreseeable oil deposits, is the most perspective. Commercial oil deposits could have formed here in large- and medium-sized local rises. Several objects of significance from the point of view of searching for oil are located in the dispute zone of the Latvia–Lithuania border and, regardless of the interest, are not available for exploration.

The other group of perspective oil objects is the objects identified in the central shelf and the dry land next to it. Oil manifestations and small oil deposits were found in many of them, and also the oil deposit of Kuldīga which is the only such deposit in Latvia was discovered.

At the end of 2015, several licences for the use of subterranean depths issued by the Ministry of Economics were in effect for the search, exploration, and extraction of hydrocarbons both in the Baltic Sea (E6, E5, E23 structures) – in internal maritime waters, territorial sea and exclusive economic zone of the Republic of Latvia, and in the territory and on the dry land. The undertaking *Odin Energi Latvia SIA* has a licence for the use of subterranean depths for the search, exploration, and extraction of hydrocarbons in the sea¹⁹. In turn, for the exploration and extraction of hydrocarbons on the dry land¹⁰ in the territory of the Republic of Latvia:

- in Dunalka rural territory of Liepāja district and in Durbe municipality the licence has been issued to the undertaking *GotOil Resources Limited, Loon Energy, Alvilis Bušenieks*;
- in Nīca rural territory of Liepāja district the licence has been issued to the undertaking *Baltic Oil Corporation PS*;
- in Gudenieki rural territory of Kuldīga district the licence has been issued to the undertaking *Baltic Oil Management SIA*.



Source: Latvian Environment, Geology and Meteorology Centre

Figure 6. Hydrocarbon deposits and extraction of oil in the Baltic oil province

Natural gas has a significant place in the structure of primary energy resources of Latvia, in 2013 it amounted to 26.9 % or 50.27 PJ of the total consumption of primary energy resources, but in 2014 – 24.4 % or 45.39 PJ.

In 2013, the total consumption of natural gas in Latvia was 1461 mill. m³ which is 3.1 % less than in 2012. The majority of natural gas – 1007 mill. m³ or 68.9 % was used in the transformation sector, including 877 mill. m³ were consumed for the generation of electricity and thermal energy in co-generation, and 130 mill. m³ – for the generation of thermal energy in boiler-houses. In 2013, 124 mill. m³ of natural gas or 8.5 % of the total consumption of natural gas of Latvia was used in the household sector, 174 mill. m³ (11.9 %) – in manufacturing, and 156 mill. m³ (10.7 %) – in other sectors. In 2014, the consumption of natural gas decreased to 1313 mill. m³.

The main supply route of natural gas to consumers of Latvia is the main networks of gas pipelines which branch off Yamal–European gas pipe in Tver district (Russia), to Saint Petersburg, Pskov, and then to Estonia, Latvia. The main networks of natural gas of the Baltic States are well developed, and their ability of providing stable supply is increased by the Inčukalns underground gas storage facility (hereinafter – the UGSF) the capacity of which is 2.3 bill. m³ of active gas. Inčukalns UGSF is the only functioning storage facility in the Baltic States, and it ensures the stability of regional gas supply. In summer season when the consumption of natural gas in the region is lower than during the cold season, natural gas is pumped into the storage facility for it to be supplied to consumers in Latvia, Estonia, north-western region of Russia, and (in smaller amounts) Lithuania during the heating

season. Inčukalns UGSF gives an opportunity to provide natural gas to consumers of Latvia, and it is not affected by short-term changes in demand for natural gas in other countries.

At the beginning of 2015, the liquefied natural gas terminal in Klaipėda (Lithuania) was accepted into operation, thus there is a possibility to purchase LNG transported by ships and, therefore, to improve the situation in the field of the safety of gas supply even more. Moreover, with completing the Klaipėda–Kuršėnai pipeline, additional volumes of gas may be supplied to Latvia, enabling that a significant part of the daily consumption of Latvia of 12.5 million cubic metres comes from an alternative source.

Terminals for ensuring transit of **oil products** by sea routes in Latvia are well developed (Riga, Ventspils), significantly expanding the diversity and competition of supply. Supply channels of oil products are sufficiently diversified as the oil products are supplied from both Eastern and Western markets. International retail oil companies that operate in Latvia may procure oil and oil products from different regions of the world. Bringing in of motor gasoline and diesel fuel for retail and wholesale needs in Latvia is possible from at least 10 oil processing undertakings within the radius of 1000–1500 km. The oil product pipeline from Samara in Russia and Novopolotsk in Belarus allows transportation of diesel fuel with the possibility of supplying it in Ilūkste and Ventspils.

Evaluation by product categories in 2014 compared to 2013 shows – the sales volume has increased for diesel fuel (by 7 %), car gas (by 13 %), fuel gas (by 9 %). In turn, the sales volume has decreased for gasoline (by 3 %), petrol (by 32 %), fuel oil (by 57 %)⁹.

3.1.3. Other Energy Resources

The remaining part in the structure of primary energy resources of Latvia is formed by net import of electricity, as well as peat, coal, coke, and waste.

Extraction of **peat** provides certain potential for ensuring energy independence. Extraction of energy peat from already prepared peat deposits, for the harvesting of which there are licences in effect, may be commenced in the area of approximately 4000 ha, extracting at least 700 thous. t of energy peat per year²⁰. More than 300 boilers in which peat can be incinerated were operating in Latvia in 2015. Approximately 462 thous. t of peat per year may be used for the generation of thermal energy. At the same time, by using peat as a heating fuel, it is important that the environmental quality does not deteriorate, particularly it is not permissible in more densely populated areas and, mainly, in Riga. Concurrently, it is important that the use of peat does not endanger achievement of the GHG emission reduction targets.

A small number of coal boiler facilities is still remaining in Latvia, mainly in private sector, part of them in Riga.

Use of waste for the generation of energy currently is not widely developed in Latvia. Primarily, this issue must be addressed within the framework of the waste management policy. Here such preconditions as the preparation of waste for regeneration, as well as economic efficiency from the aspect of waste processing are of significance. If new waste sorting facilities are constructed, then, for example, such household waste as textile, wood, cardboard, polymer admixtures or the so called alternate fuel (RDF) may be used for the generation of energy.

3.2. Establishment of the Internal Energy Market

Establishment of an integrated internal energy market of Europe that functions efficiently ensures, in the long term, higher flexibility of the system, competition among undertakings, thus promoting the development of services and competitive prices, as well as strengthens transparency of the market and improves energy safety.

The third energy package determines that it is necessary to strengthen and deepen the cooperation of the TSOs of the EU Member States which would guarantee the efficiency of control of transmission systems and transparent approach to the electricity and natural gas transmission infrastructure on the national borders of countries. The third energy package establishes an institutional framework for the development of network codes and guidelines with the purpose of coordinating, when necessary, technical, operational and market regulations governing electricity and gas networks.

In the field of electricity in 2013, the EC presented an initiative to develop a package of EU documents, determining the network codes of the EU level which until this moment were laid down only in the regulations of Member States or electricity transmission systems operators of the European network (ENTSO-E). The network codes in the sector of European electricity transmission will cover three areas – network connection, network operation, and transboundary electricity market. Altogether 10 network codes will be developed in these three areas (see Table 2). Concurrently, the development of regulation of more technical level – network codes in electricity and natural gas sectors – is taking place.

Table 2

Network Codes in Electric Energy

1. Requirement for network connections	– for electricity producers
	– for consumers of electricity
	– for high-voltage direct current systems and modules of an electricity park
2. Operation of the network	– operational safety
	– planning and schedule of operation
	– regulation of the network frequency and reserves
	– emergencies and restoration of operation
3. Single electricity market	– guidelines for assigning capacity and overload control
	– assigning of future capacity
	– balancing of electricity

In turn, in the natural gas sector gas regulations regarding overload control procedures, assigning of capacity, balancing and cooperation ability, and data exchange have been adopted in the time period until 2015. The following documents are to be developed in 2016:

- regulations regarding coordinated structures of transmission tariffs;
- regulations regarding a market-oriented approach of EU scale to distribution of the newly-built gas transmission capacity;
- regulations in relation to the oncoming CEN standard regarding the quality of high calority gas.

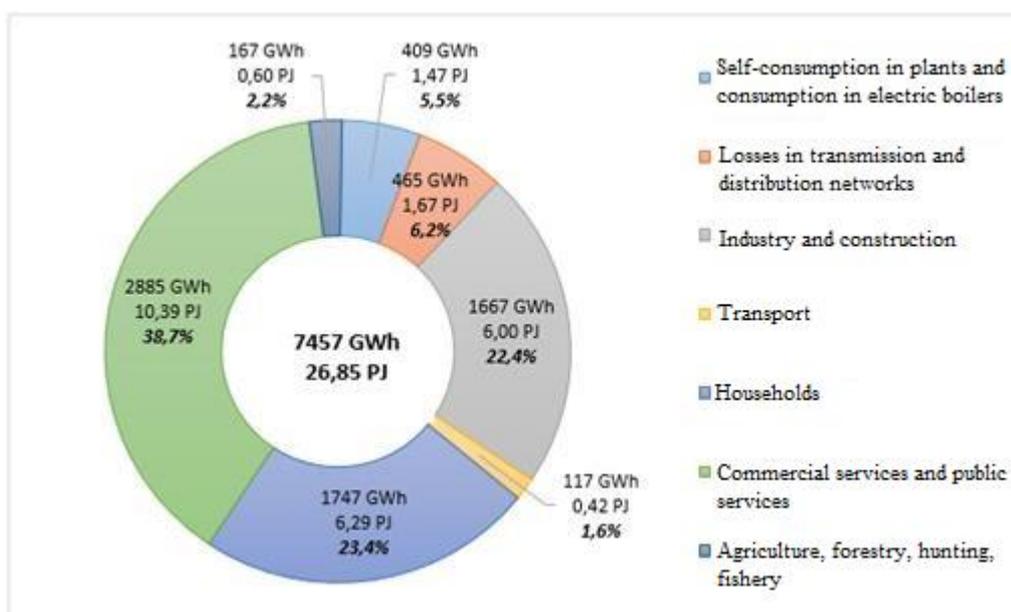
Network codes will promote the efficiency of control of the transmission systems, uniform conditions for linking the regional markets, ensuring the use of electricity and natural gas transmission infrastructure between the borders of the EU Member States for the single EU energy market.

3.2.1. Electricity Market

Consumption of Electricity

Gross consumption of electricity of Latvia was 7564 GWh in 2013 which is by 3.8 % less than in 2012. In 2014 gross consumption of electricity was 7457 GWh which is by 19 % less than in 2013. Three dominating consumption sectors should be highlighted in the gross electricity consumption structure of 2014 – commercial services and public services (38.7 %), household sector (23.4 %), and industry and construction (22.4 %) (see Figure 7).

Industry and construction is the second largest final consumer of electricity in Latvia. The largest energy consumers in the manufacturing industry are the manufacturing sector of wood products (except for manufacturing of furniture), the manufacturing sector of metals, the manufacturing sector of food products and beverages, as well as the manufacturing sector of non-metallic mineral products. Further rise in prices of energy resources may affect several sectors of significance to the economy, namely, sector of commercial and public services, processing industry (including all types of wood processing), as well as manufacturing of food, and construction. The largest undertaking of metallurgical industry in Latvia *Liepājas metalurģis AS*, whose consumption of electricity has decreased significantly in 2014, has a significant impact on consumption of electricity.



Source: CSB

Figure 7. Structure of gross electricity consumption in Latvia in 2014, GWh, PJ, %²¹

Generation of Electricity

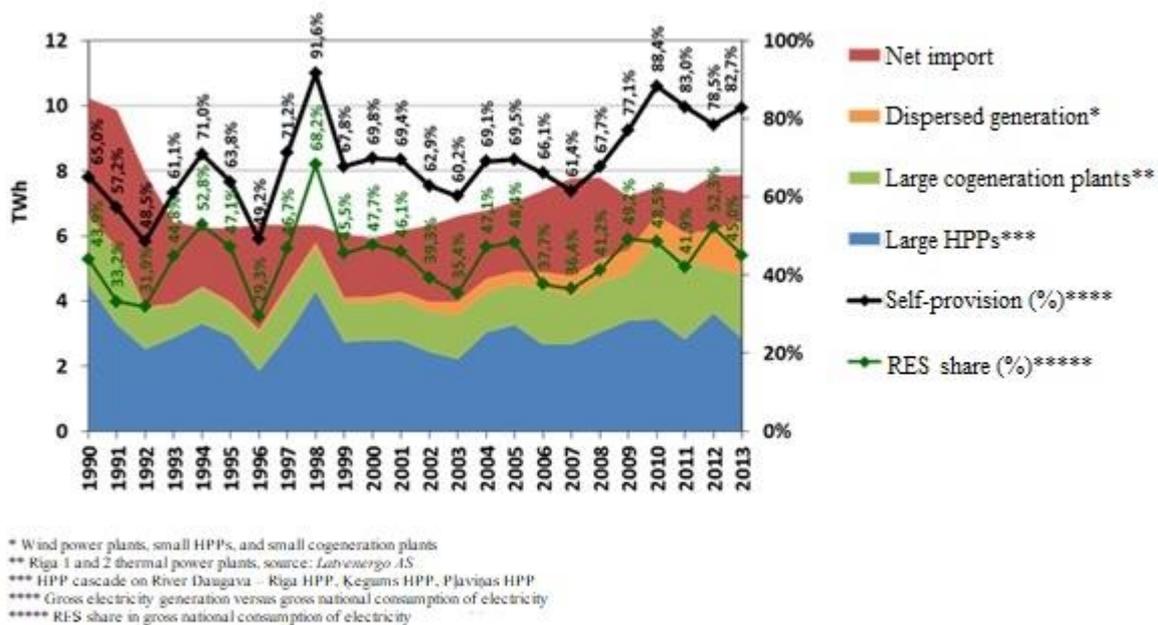
From the total gross electricity consumption of 7457 GWh of 2014 *Latvenergo AS* generated 64.2 % in its plants (Rīga 1 and 2 thermal power plants, cascade power plants of Rīga HPP on River Daugava, Aiviekste HPP, Ainaži wind power plant, Liepāja generation units), procured 17.9 % from the small electricity producers, as well as 17.9 % was formed by the net import of electricity. Rīga 1 and 2 thermal power plants are the only power plants of base capacities in Latvia with the installed capacity above 100 MW which can ensure continuous generation of electricity and heat both in co-generation and condensation mode with the maximum summary annual load up to 7500 h. The price of natural gas is one of the most significant cost factors which affect the operation of Rīga 1 and 2 thermal power plants. Short-

term reaching of the maximum price at *Nord Pool Spot* (hereinafter – the NPS) in the trading district of Latvia is less motivating for the operation of Rīga 2 thermal power plant in condensation mode, however, it allows for the operation of the plant in co-generation mode – taking into account the low heat load of the Rīga city during the summer season because inexpedient use of the producer thermal energy reduces the operation efficiency of the plants and, accordingly, increases the costs per MWh generated. Limited loading of Rīga 2 thermal power plant in co-generation mode in the summer season is possible, if the electricity price in NPS trading district of Latvia on 24 hour basis exceeds 45 EUR/MWh. Concurrently, it should be noted that, as the oil prices are decreasing, the competitiveness of natural gas technologies is also increasing – at relatively low prices of natural gas thermal power plants could implement a significant increase in domestic electricity output which, in turn, would cause increase in consumption of natural gas, activating the natural gas market.

In Latvia, the largest part of electricity is generated in three power plants of the HPP cascade on River Daugava – Ķegums, Pļaviņas and Rīga HPP the total installed capacity of which in 2013 was 1559.5 MW. In 2013, 2852 GWh of electricity were generated in these plants, forming 46 % of the total gross electricity amount generated in Latvia. The full installed capacity of HPPs can only be used in spring during the flood or high water period which lasts approximately two months. The highest amount of electricity output is usually in April. In individual cases, short periods of high water are also observed in winter. On an annual basis, power plants of the HPP cascade on River Daugava are able to ensure 200–250 MW in base mode. Plants of the HPP cascade on River Daugava also serve as the capacities for balancing of the electricity system and covering the peak (maximum) loads. Electricity outputs of the high water period allow the HPP cascade on River Daugava to successfully compete with the Baltic and Finnish NPS in the electricity market. In the time period until 2020, construction of new HPPs of higher capacity on River Daugava is not intended.

In the future, the dispersed generation of electricity might have a larger role, particularly it might have the potential in such places where services of the system are not available.

Self-sufficiency in electricity in Latvia by years varies (see Figure 8); it amounted to 61 % in 2013 accordingly (88 % in 2014). In turn, the annual evaluation report of TSOs on 2015, by evaluating the forecast of balance sheets of electricity and electrical power according to a conservative scenario²², indicates that the deficit of capacities might increase from 60 MW in 2015 to 160 MW in 2020 which, in turn, forms 96 % from the self-provision in 2015 and 89 % – in 2020. Approximately 1/5 part of the total gross electricity consumption of Latvia is formed by net import of electricity (17.9 % in 2013). Electricity is mainly imported when the water level is insufficient for the generation of hydro-electric power, as well as when it is not necessary to operate thermal power plants in co-generation mode, mostly during the summer. By ensuring sufficient interconnections in the EU global market, self-provision is of smaller significance for safe energy supply.

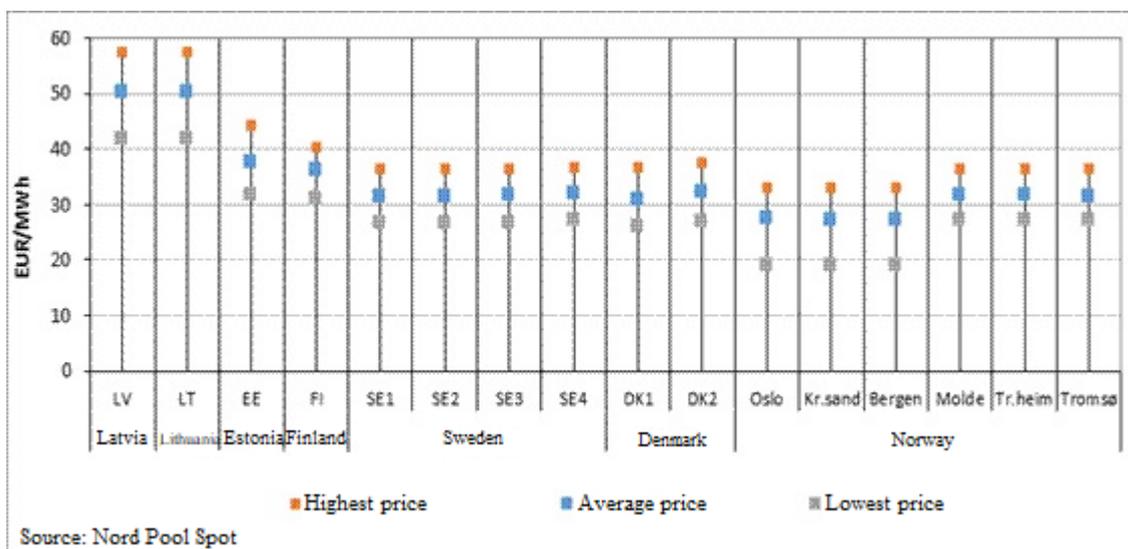


Source: CSB

Figure 8. Electricity supply structure of Latvia

Retail Trade of Electricity

In order to develop cross-border trade, and also to stimulate competition in the Baltic electricity market, NPS trading districts of electricity exchange platform were opened in the Baltic. The trading district of Latvia commenced operation on 3 June 2013, whereas Lithuania joined the NPS electricity exchange in June 2012, and Estonia – in 2010.



Source: NPS

Figure 9. Electricity prices in the NSP exchange in 2014, EUR/MWh

Distinct price variations can be observed by comparing trading districts of Latvia-Lithuania with trading district of Estonia-Finland (see Figure 9). The basis for the formation of price variations is insufficient capacity of power transmission in the cross-section of Estonia-Latvia, and insufficiency of market competitive generation in Latvia and Lithuania due to

comparatively high variable costs of electricity generation. Prices of Latvia and Lithuania as regions of electricity deficit are the same because the transmission capacity between both countries is sufficient. After switching on of the *NordBalt* (interconnection of Sweden-Lithuania, flow capacity 700 MW) cable at the end of 2015, levelling of prices is anticipated in different trading districts of the region.

In 2014, operation of contracts of the *Nasdaq OMX Commodities* exchange of financial instruments was commenced in Latvia. The financial instruments market organised by the *Nasdaq OMX Commodities* exchange has been operating in the Nordic countries for ten years already. Until establishment of the third Estonia–Latvia interconnection in 2020, limited liquidity can be anticipated in the financial instruments market of *Nasdaq OMX Commodities* in these countries, however, the risk of price instability might reduce.

Retail Trade of Electricity

The electricity price in the conditions of a free market is most efficiently determined in the long term. Therefore, there are no more regulated electricity tariffs in an open electricity market, however, the system services and the mandatory procurement component are being regulated. Consumers of electricity may choose the electricity trading offer which is the most appropriate for their consumption of electricity.

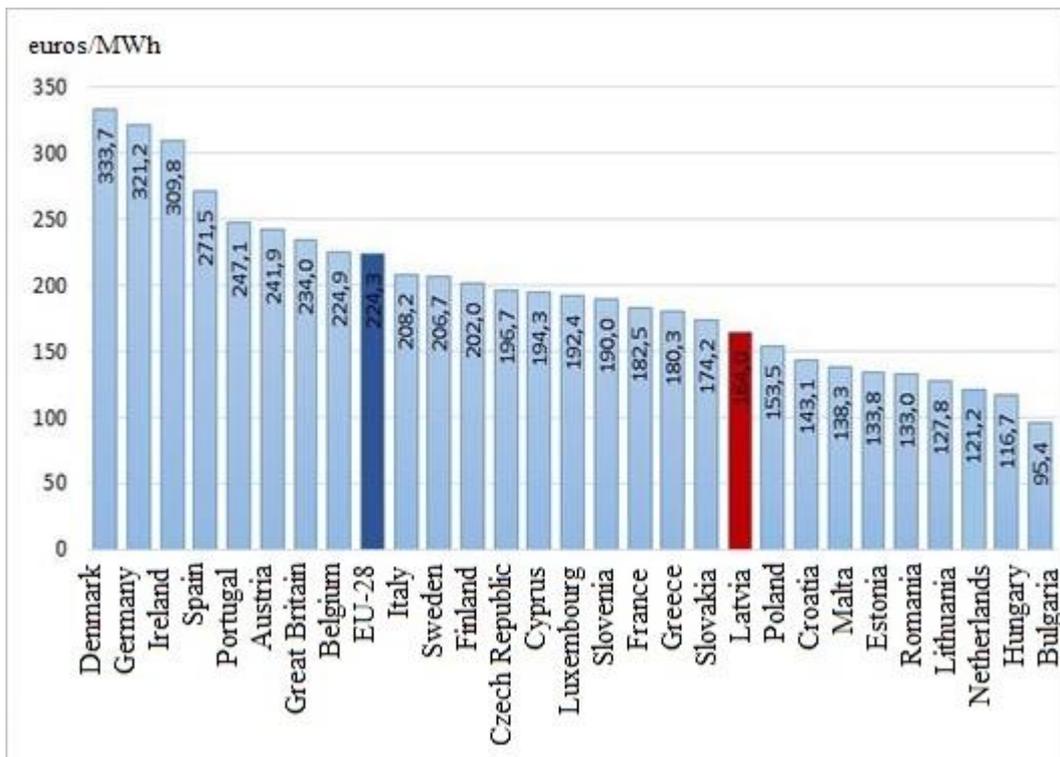
In Latvia, opening of the electricity market began on 1 July 2007. The different stages of opening the electricity market are presented in Figure 10:



Source: Ministry of Economics

Figure 10. Division of the electricity market according to stages

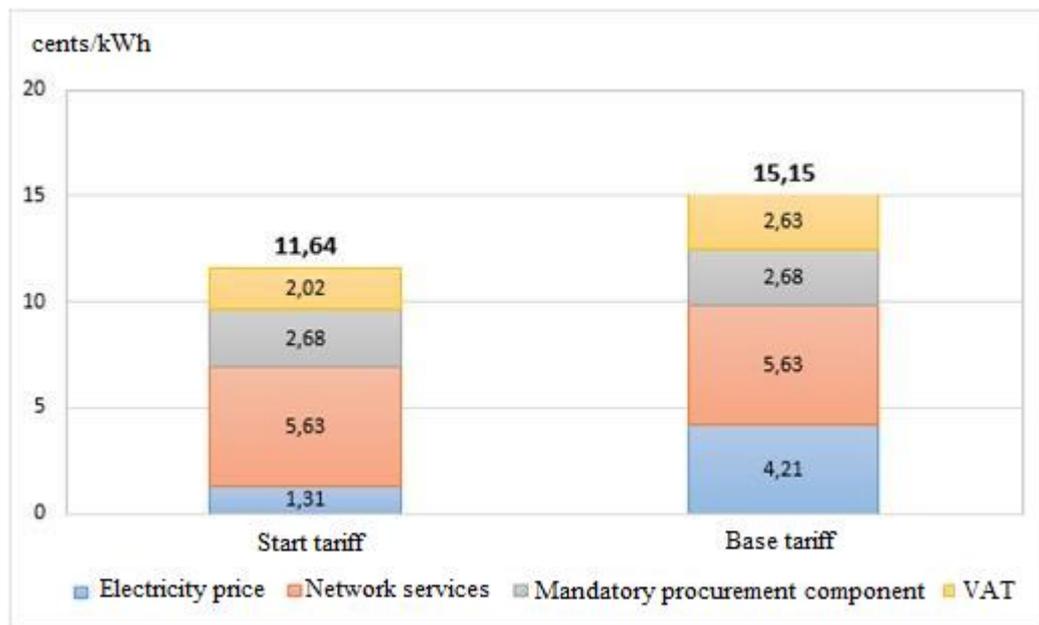
In accordance with the Eurostat data, the electricity price (including all taxes and duties) for households (with the annual consumption of 1000–2500 kWh) in Latvia in the first half of 2015 was the tenth lowest in the EU – 164 euros/MWh (see Figure 11). Accordingly, in Estonia – 133.8 euros/MWh and in Lithuania – 127.8 euros/MWh.



Source: Eurostat

Figure 11. Electricity price (including all taxes and duties) for households (with the annual consumption 1000–2500 kWh) in the first half of 2015, euros/MWh

The total price of electricity is formed from the electricity price, services of the transmission and distribution network, the mandatory procurement component (hereinafter – the MPC), the trade service, and the value added tax (VAT 21 %). After liberalisation of the electricity market in 2015, the prices of network services approved by the Public Utilities Commission (hereinafter – the PUC) are in effect – 5.63 cents/kWh and the MPC which currently is specified 2.68 cents/kWh and is partially financed from the State budget funds. Therefore, only the wholesale price of electricity is variable, varying depending on the market situation. In 2014, the average wholesale price in the price zone of Latvia was 50.12 cents/kWh which exceeded the wholesale price of electricity included in both the start tariff and the base tariff (see Figure 12).



Source: Ministry of Economics

Figure 12. Electricity tariff structure for household electricity users (in effect from 1 April 2011 to 31 December 2014)

On 1 January 2015, the electricity market was opened also to households as it is provided for by the amendments to the Electricity Market Law of 20 March 2014. Concurrently with opening the electricity market to households, approximately 847 300 household consumers joined the market, forming approximately 90 % of the total number of users. The electricity price is not subsidised for all households anymore. The reduced electricity price is provided for the vulnerable groups of inhabitants – poor or low-income families (persons), families with a disabled child, persons with the first group disability, and large families (the difference of the electricity price is subsidised).

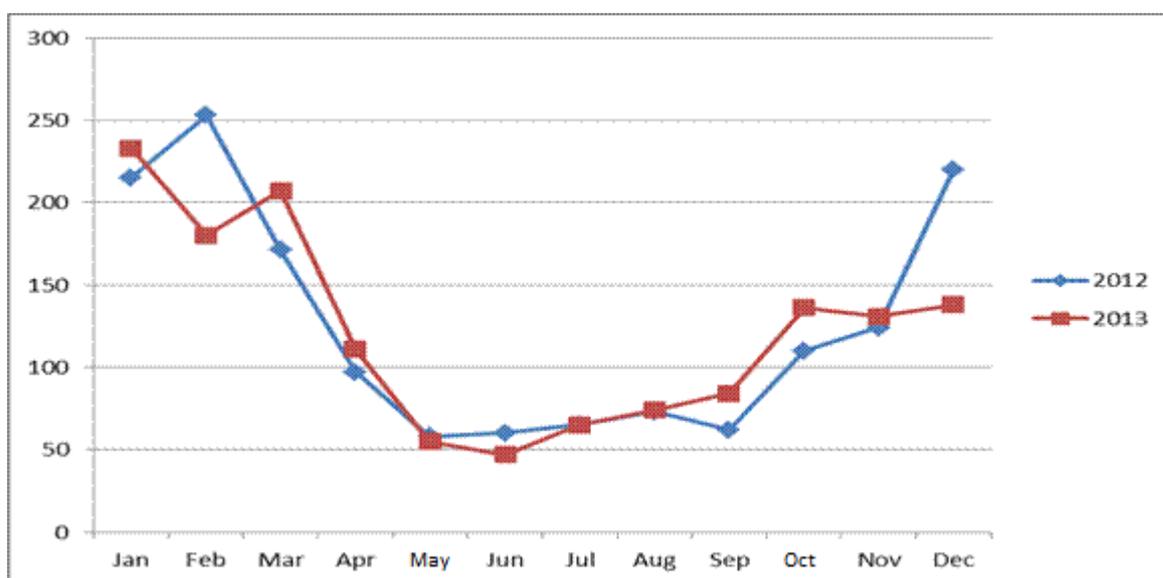
A poor or low-income family (person), as well as a family with a disabled child and a person with the first group disability is provided with 100 kilowatt hours of electricity for the subsidised price of 0.0131 euros per kilowatt hour in each accounting period (calendar month) and a large family – with 300 kilowatt hours of electricity for the price of 0.0131 euros per kilowatt hour in each accounting period (calendar month). In such case, the total electricity price (including the electricity price, trading services, mandatory procurement component, value added tax, and network services) is equivalent to the previous start tariff – 11.64 cents per kilowatt hour. In turn, for the amount of electricity which exceeds the abovementioned 100 kilowatt hours for a poor or low-income family (person), as well as family with a disabled child and a person with first group disability, and 300 kilowatt hours for a large family in the accounting period, the protected consumer pays the price offered by the electricity trader and selected by the protected consumer or the specified universal service price. The obligation of the service provider of a protected consumer in 2015 was fulfilled by the *Latvenergo AS*, however, it will be selected according to the procedures of a competition in accordance with the requirements laid down in the Electricity Market Law and the Public Procurement Law. Henceforth, the operation of this solution should be evaluated, improving it in case of necessity (including evaluating the possibilities of providing assistance to less protected social groups also for the provision of other essential services).

3.2.2. Natural Gas Market

At large the European Union still depends, to a great extent, on the natural gas supplies of the third countries. The natural gas supply system of Latvia is not directly connected to the systems of other EU Member States, except for Lithuania and Estonia. However, since Klaipėda LNG terminal is operating, there is a possibility to receive natural gas physically not only from Russia, but also from other countries.

Consumption of Natural Gas

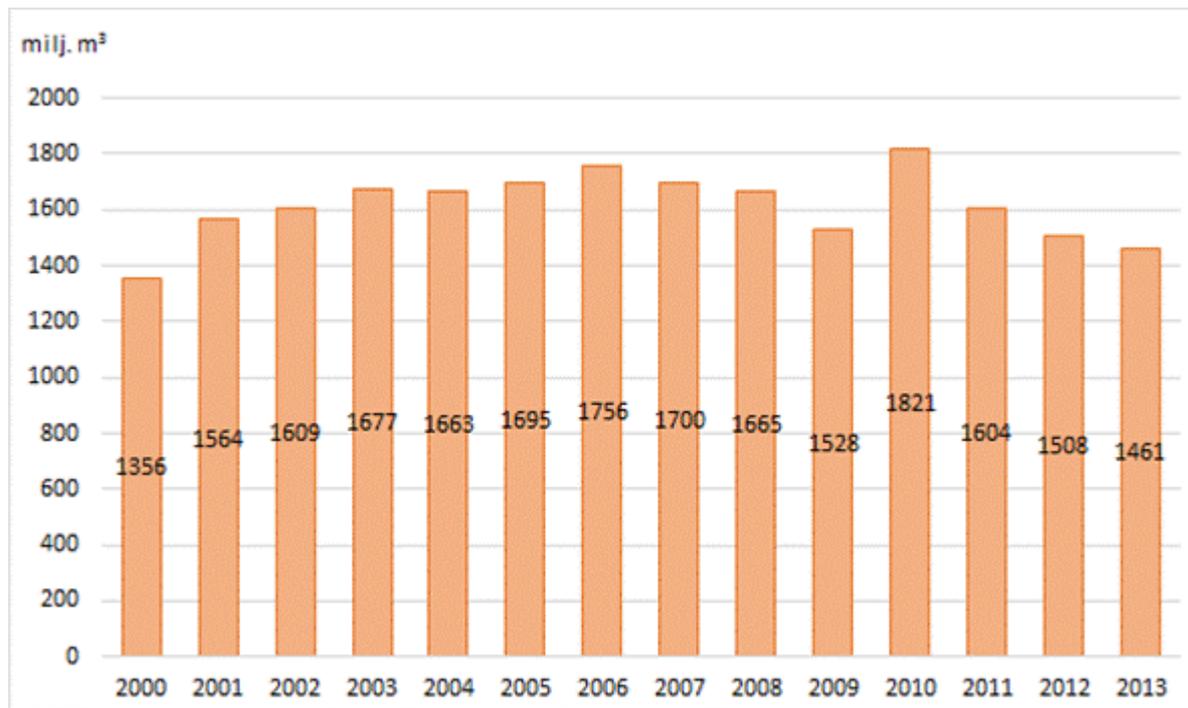
The structure of natural gas consumption of Latvia is very much seasonal by nature (see Figure 13). The heat loads of the centralised heating supply system increase significantly in the winter.



Source: CSB

Figure 13. Fluctuations of the natural gas consumption in 2012–2013 by months, mill. m³

Since 2010 the consumption of natural gas has decreased in Latvia (see Figure 14). The main sectors where natural gas is consumed are the transformation sector (energy sector), industry, and construction, as well as the household or individual consumption sector. Approximately more than 50 % of the total consumption of natural gas in the country is used for the generation of electricity and centralised thermal energy in cogeneration plants. The two largest power plants of Latvia (Rīga 1 and 2 thermal power plants) are the plants of combined cycle natural gas in which electricity and heat for the heating supply of the Riga city is simultaneously generated. Taking into account the seasonal nature of high heat loads, intensity of the large cogeneration plant electricity generation in co-generation mode is also seasonal.



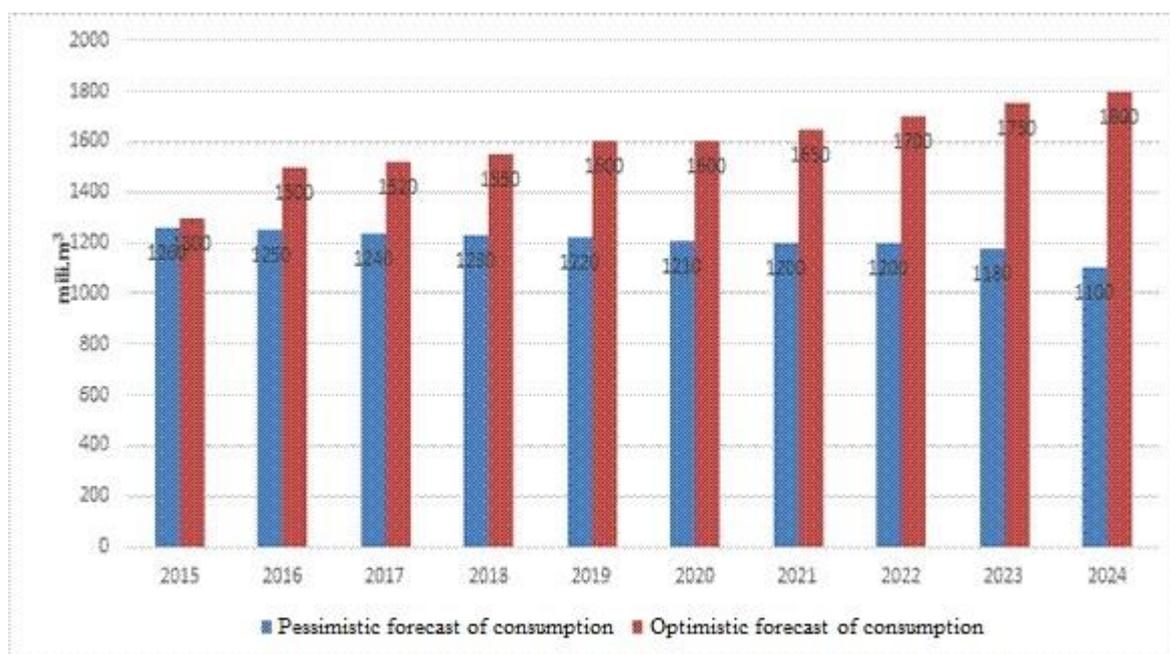
Source: CSB

Figure 14. Total consumption of natural gas in Latvia in 2000-2013, mill. m³ per year

The total consumption of natural gas is affected by the following factors:

- external air temperature that, for example, significantly exceeded the average statistical norm during the warm winter period in 2013;
- joint development of national economy, including industry. For example, in 2013 the operation of *Liepājas Metalurģas AS* which is one of the largest energy consumers in the country was temporarily suspended;
- transition from natural gas to alternative fuels in the generation of centralised heat;
- introduction of energy efficiency measures, for example, thermal insulation of buildings.

The natural gas transmission system operator has developed the forecast of the natural gas consumption of Latvia for two scenarios – pessimistic and optimistic (see Figure 15). The pessimistic scenario takes into account the specific objectives for the improvement of energy efficiency and accordingly reduction of the total consumption of primary energy resources, for the replacement of imported energy resources with local energy resources, including RES, as a result of which gradual reduction of natural gas consumption is foreseen in Latvia from 1260 mill. m³ in 2015 to 1100 mill. m³ in 2024 (see Figure 15).



Source: Annual evaluation report of the natural gas transmission system operator on 2014.

Figure 15. Forecast of natural gas consumption for 2015–2020 (the pessimistic and optimistic scenario), mill. m³

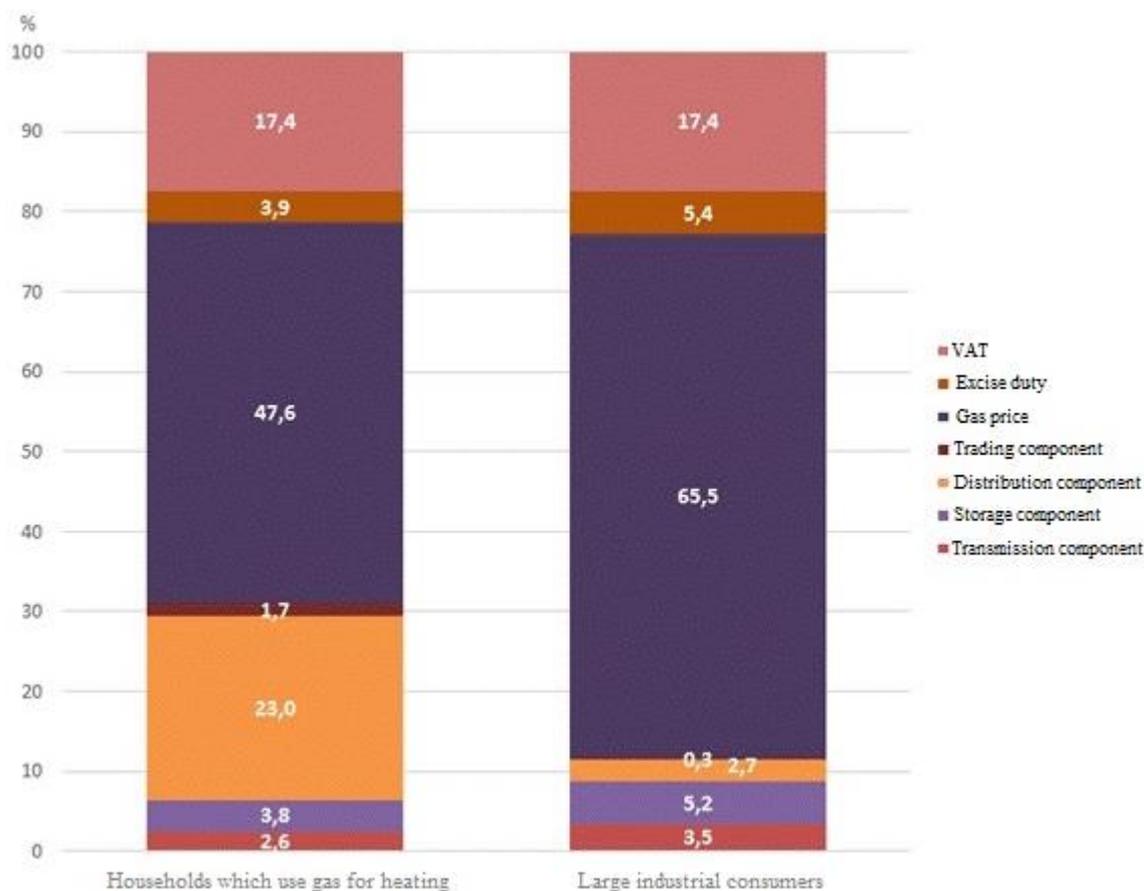
In the optimistic scenario changes in the consumption of natural gas are anticipated, taking into account the globalisation trends of the natural gas market and the development of new technologies as a result of which the prices of energy resources could become more equivalent, as well as the planned development of the natural gas market as a result of which the Eastern Baltic region, including Latvia, will be provided with supplies of natural gas that are alternative to supplies from Russia, and isolation of the natural gas market of the Baltic States and Finland from the joint EU natural gas market will be prevented.

Increase in consumption of natural gas might be facilitated by reduction in prices of oil products and, therefore, also natural gas. Thus, the share of natural gas as the fossil fuel that is most friendly to the environment in the total balance sheet of energy resources might remain in the current level, ensuring a small increase in the demand for natural gas from 1300 mill.m³ in 2015 to 1800 mill.m³ in 2024 (see Figure 21).

In case of the optimistic scenario it is expected that the structure of the use of natural gas will change and, as a result of support of energy efficiency measures and renewable energy sources, the consumption of natural gas will decrease in centralised heating supply, however, it will increase in transport, manufacturing, and decentralised heating systems. Taking into account the significantly lower intensity of emissions compared to coal and oil products, and the development of market in the world, natural gas will preserve a significant role in the balance sheet of primary energy resources of Latvia alongside with renewable energy sources.

Consumption of natural gas may be affected by more extensive use of natural gas in the transport sector. In relation to introduction of the requirements of Directive 2014/94/EC (see Sub-section 3.3.3). According to the forecasts of sectoral representatives the number of vehicles operated by natural gas might increase until the end of 2020.

The total price of natural gas is formed by the price of natural gas, the trading component, services of the storage, transmission and distribution system, trading service, and tax (see Figure 16).



Source: Ministry of Economics

Figure 16. Structure of the natural gas price/tariff (%)

In 2009, *Latvijas Gāze AS* entered into long-term contracts with gas suppliers *Gazprom AAS* and *ITERA Latvija SIA* until 2030 which provide for sufficient supplies of natural gas to consumers in Latvia. These contracts also lay down the technical parameters of the natural gas supply (pressure, calority, etc.), supply and storage amounts (annual and monthly), formula for calculating the prices of natural gas, payment conditions, conditions for reviewing the contracts, and other liabilities. As it is common in the natural gas business, the supply contracts include the “take-or-pay” clause.

The formula for calculating the price of natural gas laid down in the contracts takes into account the price/quotation index FOB ARA (Free On Board Amsterdam, Rotterdam, Antwerp) of heavy fuel oil with sulphur content up to 1 % and diesel fuels with sulphur content up to 0.1 % in exchanges of oil products, as well as the relation of the rate of euro specified by the European Central Bank and the USA dollar.

In 2014, 5 contracts were entered into for the transportation and storage of natural gas in Inčukalns UGSF (see Table 3).

Table 3.

Existing long-term natural gas supply contracts of *Latvijas Gāze AS*

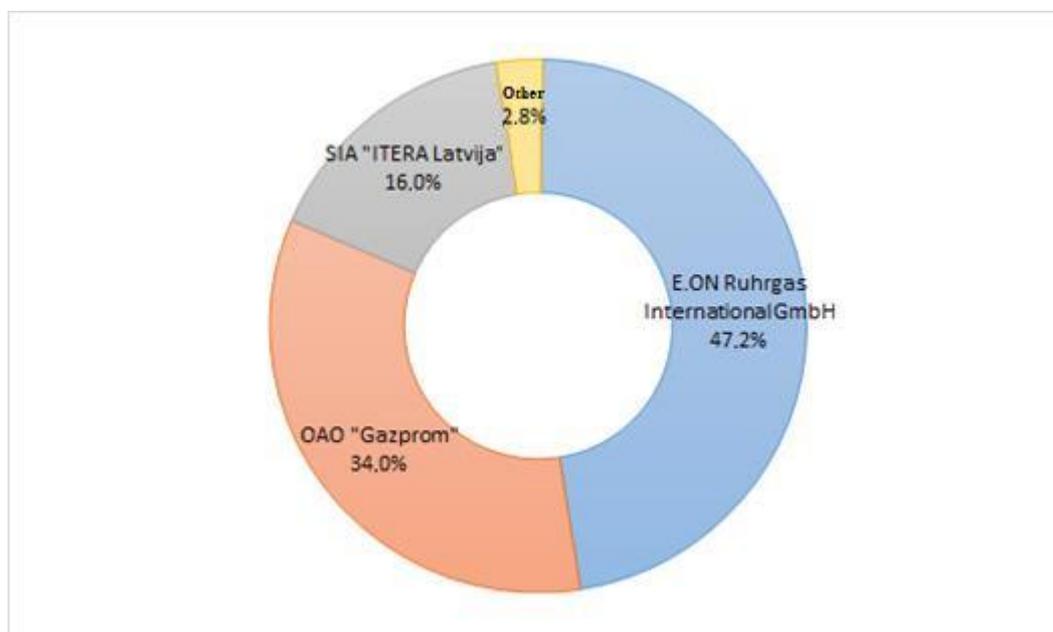
Contracting party	Date of signing	Term of operation	Service
<i>LITGAS UAB</i>	30 December 2013	10 February 2017	Transport, storage

<i>Lietuvos duju tiekimas UAB</i>	19 December 2014	1 April 2017	Transport, storage
<i>Baltic Energy Partners OÜ</i>	30 October 2014	31 December 2014	Transport
<i>Baltic Energy Partners OÜ</i>	19 December 2014	30 April 2015	Transport
<i>Elering Gaas AS (EG Vörguteenus AS)</i>	19 December 2014	31 December 2015	TSO

Five more contracts for the transportation and storage of natural gas were entered into in 2015.

Latvijas Gāze AS

The largest stockholders of the *Latvijas Gāze AS* are *E.ON Ruhrgas International GmbH*, *Gazprom AAS*, and *ITERA Latvija SIA* (see Figure 17). The largest stockholder of *Latvijas Gāze AS* *E.ON Ruhrgas International GmbH* has published a notification on the planned withdrawal from the natural gas market of the Baltic States, including Latvia. The stocks of *Latvijas Gāze AS* are quoted on the NASDAQ OMX Rīga exchange, and their total number is 39.9 million.



Source: *Latvijas Gāze AS*

Figure 17. Structure of the *Latvijas Gāze AS* shareholders, as of 31 December 2013

Until the natural gas market liberalisation is completed, the *Latvijas Gāze AS* keeps being a vertically integrated undertaking which provides trading, distribution, transmission, and storage services. By fulfilling the requirements of Directive 2009/73/EC it is expected that after 3 April 2017 the transmission and storage functions in the natural gas sector of Latvia will be completely separated from trading.

Within the context of Directive 2009/37 EC two individual derogations from several requirements which are applicable within different terms, correspond to Latvia.

– “Emergent market” derogation was in force until 4 April 2014, when ten years had passed since the first commercial natural gas supply according to the first long-term contract. Therefore, starting from 4 April 2014 access of the third parties to the natural gas distribution, transmission systems and natural gas storage facility, introduction of the balancing

fee, and prohibition of cross-subsidisation should be ensured as provided for in amendments of 13 March 2014 to the Energy Law.

– “Isolated market” derogation which was in force until the moment when Latvia is connected to the natural gas systems of any European Union Member State, except for Estonia, Lithuania, and Finland, or the dominating supplier’s share in the total natural gas consumption of Latvia will decrease below 75 %.

Taking into account that from 2015 natural gas supplies are physically possible also from the LNG terminal of Lithuania and alongside with reconstruction of the gas pipe Klaipėda–Kiemėnai there is a theoretical possibility that the share of the dominating supplier in provision of the total natural gas consumption of Latvia is less than 75 %, derogations from Directive 2009/73/EC are not applicable to Latvia anymore.

3.3. Energy Infrastructure

Implementation of the infrastructure projects is a significant aspect to complete the establishment of the internal market. Closer integration of networks is of particular importance to the countries the electricity or natural gas networks of which are not connected to other EU countries, the so called “energy islands”.

For the time period from 2014 to 2020 a new financial instrument has been established at the EU level within the framework of which investments in the development of the EU infrastructure in the field of transport, energy and telecommunications – Connecting Europe Facility (hereinafter – the CEF) – will be supported. The budget provided for the energy sector for the time period from 2014 to 2020 within the scope of the CEF forms 4.7 bill. euros.

In order to promote introduction of projects, implementation of the long-term energy infrastructure policy is determined by Regulation No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009 (hereinafter – Regulation No 347/2013). Regulation No 347/2013 determines the establishment of lists of Projects of Common Interest (hereinafter – the PCI) at the EU level. It is provided for in Regulation No 347/2013 that projects which are included in the PCI list will not only be able to apply for financing, but also will be able to use procedures for rapid and efficient receipt of permits, concurrently conforming to the environmental assessment and protection standards. In order to implement the requirements of Regulation No 347/2013, on 14 October 2013, using the procedure of delegated acts, the EC adopted the first PCI list of the European Union (EC Regulation No 1391/2013) which includes 248 projects – electricity and gas transmission, storage and LNG projects, as well as projects in the field of smart networks and oil. On 18 November 2015 the EC presented the second PCI list of the European Union. The second PCI list of the European Union which includes 195 projects in total, will officially come into force at the beginning of 2016. Regulation No 347/2013 also provides for the possibilities of receiving EU support in cases when such projects are of strategic importance, however, cannot be implemented, taking into account only the market interests. The abovementioned Regulation will be in force until 2020, and within this period the PCI list is intended to be updated after every two years (in 2017 and 2019 accordingly). The role of the competent authority provided for within the framework of Regulation No 347/2013 which is assigned to facilitate the administrative procedures in relation to introduction of the PCI of the energy sector is assigned to the Ministry of Economics. Therefore, further facilitation of the conditions for the introduction of PCI projects is necessary.

As regards the construction or reconstruction of the energy infrastructure objects at large, it should be noted that it is necessary to take into account the construction of new transport infrastructure objects in order to use the advantages created by a uniform implementation of significant projects, for example, using joint infrastructure corridors.

3.3.1. Electricity Infrastructure

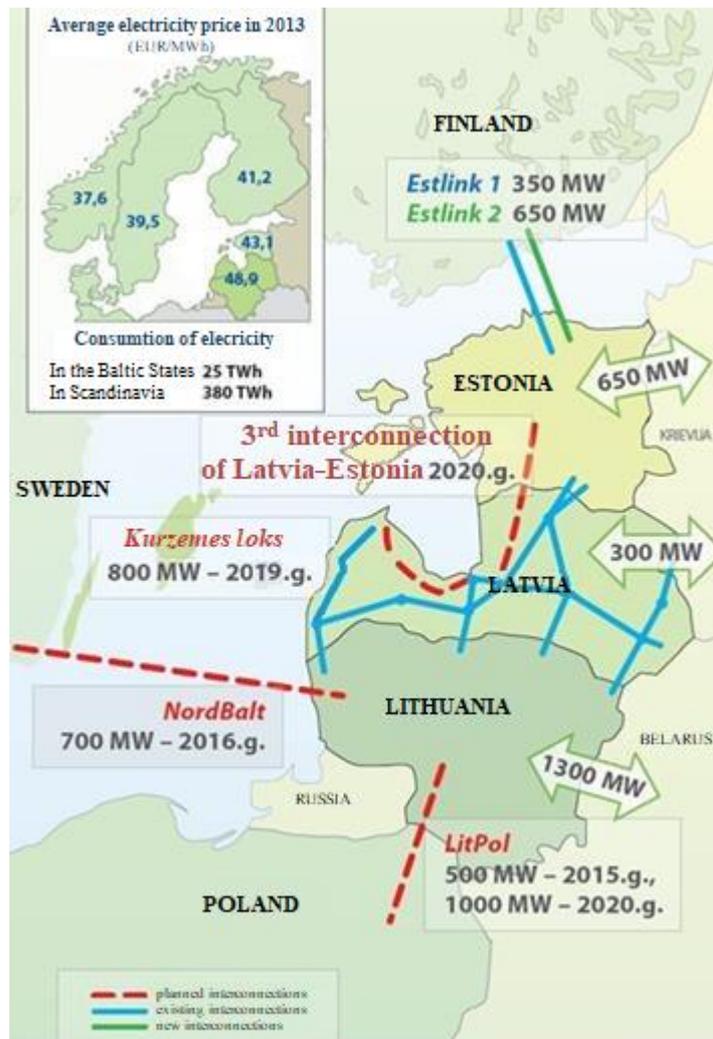
Transmission System

Sufficient interconnections are one of the most important preconditions for the optimal functioning of the electricity market.

The quantity and transmission capacity of interconnections of the Baltic electricity system between the Baltic States and other EU Member States for the moment is sufficient only between Finland and Estonia. They are direct current cables *Estlink 1* and *Estlink 2* which are connecting the energy systems of Finland and Estonia. *Estlink 1* (Hark–Espoo; transmission capacity – 350 MW) and *Estlink 2* (Puusi–Anttila; transmission capacity – 650 MW).

At the end of 2015 construction of an electricity interconnection between Lithuania and Sweden was completed (*NordBalt*; transmission capacity – 700 MW, from Klaipėda in Lithuania to Nybo in Sweden) (see Figure 18). It is expected that the *NordBalt* interconnection will help to create a joint, uniform electricity market of the Baltic and Nordic States and will provide possibilities for Lithuania and Latvia to procure larger amounts of electricity from the Northern European countries that are rich in hydro resources.

Work is also underway on the establishment of a direct current connection of electricity of Lithuania–Poland *LitPolLink 1* with transmission capacity of 1000 MW; from Kruonis hydro-accumulating plant (HAP) in Lithuania via Alytus to Narev in Lithuania and Ełk in Poland. The first round of interconnection link of this electricity system (with transmission capacity of 500 MW) was completed at the end of 2015. Active discussions on the necessity of the second interconnection *LitPolLink 2* are taking place, particularly in the case of synchronization of the Baltic States with the continental Europe.



Source: ENTSO-E

Figure 18. Map of interconnections of energy systems

In order to improve the infrastructure of the electricity transmission system, implementation of the project *Kurzemes loks* [Kurzeme Ring Project] is taking place in Latvia (see Annex 3). The first stage of the project *Kurzemes loks* included construction of a 330 kV high voltage electricity line, which connected the 330 kV substation Rīga 1 thermal power plant with the substation Imanta (completing the 330 kV arc around Riga) and was implemented in 2013. The second stage of 330 kV high voltage electricity line Grobiņa–Ventspils was constructed in 2014. The construction costs of the first and second stage of the project were 98.5 mill. euros from which 38.5 mill. euros were covered from the funds of the European Energy Programme for Recovery. Costs of the third stage of the project *Kurzemes loks* are 127.42 mill. euros, and it is planned to be finished at the end of 2019. The project *Kurzemes loks* has been included in the PCI list, and CEF financing (55.09 mill. euros) has been granted for the implementation of the third stage of the project in accordance with EU Regulation No 1316/2013.

Concurrently with implementation of the *NordBalt* project, work is also underway on the creation of the third interconnection of Latvia–Estonia electricity systems (see Annex 3). The project intends to connect the Rīga 2 thermal power plant substation with Kilingi–Nõmme in Estonia, as well as to construct a connection between Harku and Sindi on the Estonian side. The project is envisaged to be implemented until 2020, and it will ensure an increase in the flow capacity between Latvia and Estonia in the amount of 500–600 MW. The third interconnection of electricity systems of Latvia–Estonia has been included in the PCI list

of the European community, and CEF financing (112.3 mill. euros) has been granted for its implementation in accordance with EU Regulation No 1316/2013.

In contrast to other EU countries, energy systems of the Baltic States are operating in a parallel, synchronized mode with the IPS/UPS (the joint system of Russia/the integrated energy system of Ukraine, Belarus, Kazakhstan, Kyrgyzstan, Azerbaijan, Georgia, Tajikistan, Moldova, and Mongolia) region, not European energy systems. The cross-border operation of electricity markets of the Baltic States, Russia, and Belarus is governed by the BRELL (abbreviation from Belarus, Russia, Estonia, Latvia, Lithuania) contract entered into by the TSOs of Belarus, Russia, Estonia, Latvia, and Lithuania. In 2015, the operation of the cross-border market with Russia and Belarus was taking place in the NPS electricity exchange platform. In order to evaluate the integration of the energy systems of the Baltic States in the internal electricity market of the EU and the potential synchronized work on electric networks of the continental Europe, in 2012/2013 TSOs of the three Baltic States – *Augstsprieguma tīkls AS*, *Elering*, and *Litgrid* carried out a feasibility study by attracting the consultant of the Swedish energy sector *Gothia Power*. The study concluded that synchronization is technically possible, however, a joint support of the Baltic States and the states of the Baltic Sea Region, mainly Poland, support of the organisations regulating public utilities, and support from the European Commission in order to conduct negotiations with Russia and Belarus, as well as substantial financial resources will be necessary for its achievement. At the end of 2015, the Baltic States and the European Commission took a decision to conduct studies, evaluating also the alternative scenarios – the autonomous work of the Baltic States in the “island mode” and the synchronised work of the Baltic States with the Scandinavian countries. The studies were planned to be completed in 2016. In addition, in 2015 a decision was taken to create a technical working group within the framework of the BEMIP format in which work on the synchronization project would take place.

The commencement of synchronised work of the Baltic States transmission networks with the European networks is planned after 2025.

Distribution System

In order to ensure the supply of electricity to consumer objects whose number exceeds one million in Latvia, the provision of good quality distribution system services has a significant role. In 2015, the functions of the distribution system operator in Latvia were carried out by eleven undertakings of which *Sadales tīkls AS* that belongs to *Latvenergo AS* Group is the largest one. It provides the supply of electricity to more than 99 % of the State consumers of electricity and connection of new consumers of electricity to the electricity network, as well as supervises the use of electricity, meters the electricity consumption, and implements measures for the reduction of losses in the distribution network.

The joint length of electricity distribution networks in Latvia in 2014 reached 94 609 kilometres. Low voltage 0.4 kV and medium voltage 6–20 kV electrical installations are used for the provision of distribution services. Approximately one third (35 648 kilometres) of the distribution system are formed by a medium voltage 6–20 kV network and approximately two thirds – 58 961 km of low voltage 0.4 kV network. The supply of electrical appliances of consumers connected to the electricity network is ensured by 26 764 substations (6–20/0.4 kV). From 1 April 2011 to 2014, the differentiated tariffs of the electricity distribution system of *Sadales tīkls AS* were not reviewed²³.

Safety of electricity supply is most frequently judged by two most essential indicators of the sector – the duration of disruptions in electricity supply per client per year (hereinafter – SAIDI) and the frequency of disruptions in electricity supply per client per year (hereinafter – SAIFI) (see Figures 19 and 20).

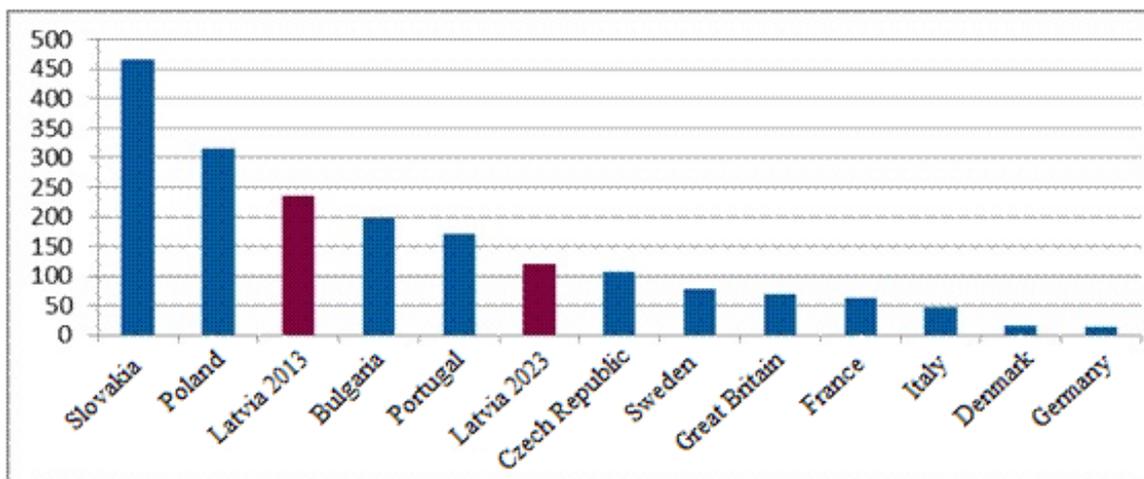


Figure 19. Duration of disruptions in electricity supply per customer in European countries per year (SAIDI), minutes

During the last 10 years the improvement of SAIDI and SAIFI parameters has been one of the main tasks of the distribution system operators of European countries.

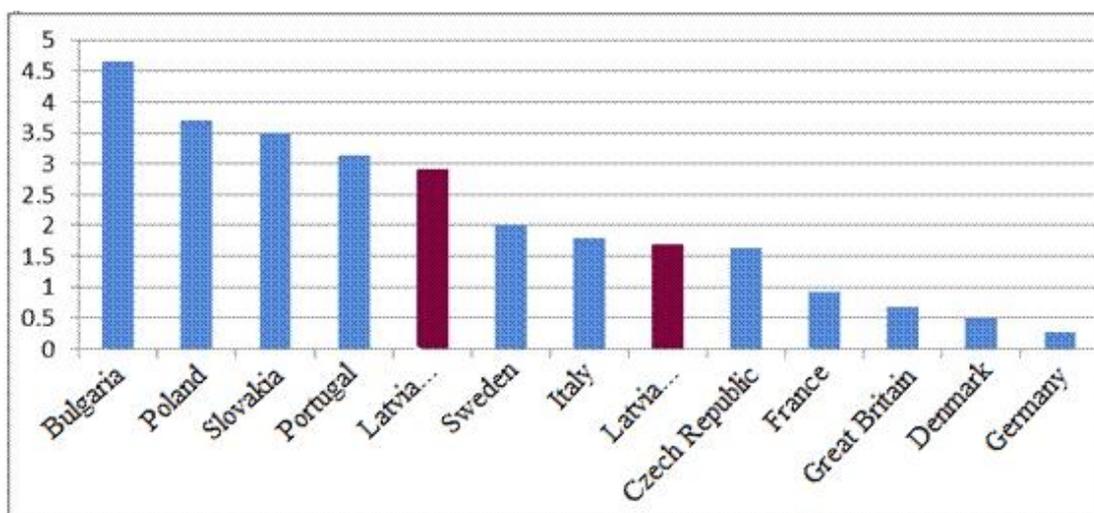


Figure 20. Frequency of disruptions in electricity supply per customer in European countries per year (SAIFI), times

In 2014, disruptions of electricity supply in the electricity network of overhead lines were recorded 29 712 times which is by 14 % less than in 2013. The largest share of the number of disruptions was formed by disruptions in the overhead lines (OL), particularly in the low-voltage electricity network. In 2014, 43 % of the total number of disruptions occurred as a result of adverse weather conditions.

The number of damages in distribution electricity networks was successfully reduced by converting overhead lines into cable lines and increasing the cleaning of OL routes and the amount of dangerous tree felling.

In 63 % of cases, technological disturbances in the cable electricity network were caused by ageing of the materials used in the construction of cable lines. By restoring the cable electricity network, the number of damages in the cable network has been reduced by 9 % – from 2886 cases in 2013 to 2644 cases in 2014.

Damages to the electricity network caused by the third parties have a large impact on the quality of electricity supply. In 2014 damages caused by the third parties were recorded 678 times which is by 182 cases or 37 % more than in 2013.

The objective of *Sadales tīkls AS* is to reduce the SAIDI and SAIFI indicators every year. In 2014, the total SAIDI indicator was reduced to 409 minutes (for planned disconnections 256 minutes, unplanned – 153 minutes), SAIFI of the planned disconnections to 0.99 times, SAIFI of the unplanned disconnections to 2.38 times. Indicators are affected by both the nature of the damage to the electricity network and the amount of the work to be carried out, as well as the environment in which the electricity network is located. 53 % of the territory of Latvia is covered by forests where access to the electricity network is hindered.

Improvement of the SAIDI and SAIFI parameters has been the priority of *Sadales tīkls AS* for the last three years and is its objective for the next 10 years which is defined in the Development Plan of *Sadales tīkls AS* approved in 2014 for the timely and efficient restoration of electricity networks in order to increase the quality and safety of electricity supply for consumers in Latvia until 2023. The following priorities are set in the Development Plan of *Sadales tīkls AS*:

- restoration of the electricity network, using safer technical solutions, and directing the financing as a priority to the restoration of the strategically most important 6–20 kV electricity network;
- accelerated improvement of the quality of electricity supply by implementing the conversion of 20 kV overhead lines into cables, automation of the electricity network, and construction of new 110 kV substations in order to reduce the SAIDI and SAIFI indicators;
- reduction of SAIDI to 120 minutes;
- reduction of SAIFI to 1.7 times;
- improvement of the connection process by reducing the number of necessary documents and accelerating the connection process;
- improvement of the maintenance works of the electricity network in order to reduce the duration of disconnections necessary for them;
- development of the smart network and introduction of smart meters for all clients;
- study of technologies and further optimisation of internal processes in order to introduce the necessary technical solutions in a timely manner which would allow the achievement of the specified targets in a more efficient manner;
- improvement of cooperation with local governments and other holders of communications which allows to improve the development of the electricity network.

The capital investment programmes planned by *Sadales tīkls AS* in the period of 10 years which are provided for improving the quality of electricity supply will allow to improve the efficiency of the distribution system. For example, the development of the smart network will include automation of the distribution network, gradual introduction of the elements of the smart network (sensors, active operative control facilities of the electricity network), and introduction of the smart electricity metering which would allow the consumers to control their consumption. It is planned that the smart electricity metering will be introduced for all final consumers of electricity by 2023. At the moment, for example, 10 778 smart metering appliances have already been installed for the large legal electricity consumers.

Generators of renewable electricity producers are being increasingly connected to the distribution networks. As their share increases, the impact on normal operation of the network, safety of electricity supply to clients, and quality of voltages also increases. Therefore, changes must also be made to the technical and technological equipment of the network to ensure harmonious, safe, and qualitative operation of the distribution system in the future.

In order to ensure the reconstruction and modernisation of electricity supply networks, use of innovative technical solutions, by improving the provision of safe and qualitative distribution services, significant projects for the improvement of the quality and safety of electricity supply that require long-term investments are being carried out each year. In order

to implement the abovementioned investment projects, the total increase in the tariff might form 1–3 % per year depending on the growth of national economy and the consumption of electricity related thereto.

Henceforth until 2020 it is also necessary to solve the long-standing problem in relation to the issues of the property ownership, as well as restoration and maintenance of electricity networks for the so called ownerless 20/0.4 kV networks to which electrical appliances of consumers are connected.

3.3.2. Natural Gas Infrastructure

Latvijas Gāze AS ensures the operation of the Inčukalns underground gas storage facility, transmission gas pipeline system in the length of 1191 km, distribution gas pipeline system in the length of 4950 km which includes the natural gas pipeline network, gas regulation facilities, electrical protection facilities.

The construction of the natural gas supply infrastructure which was commenced in 1962, has taken place in territories which are the most economically active and in which there is a higher level of the spatial development (see Figure 21). It has historically emerged that *Latvijas Gāze AS* invests only in economically justified construction objects.

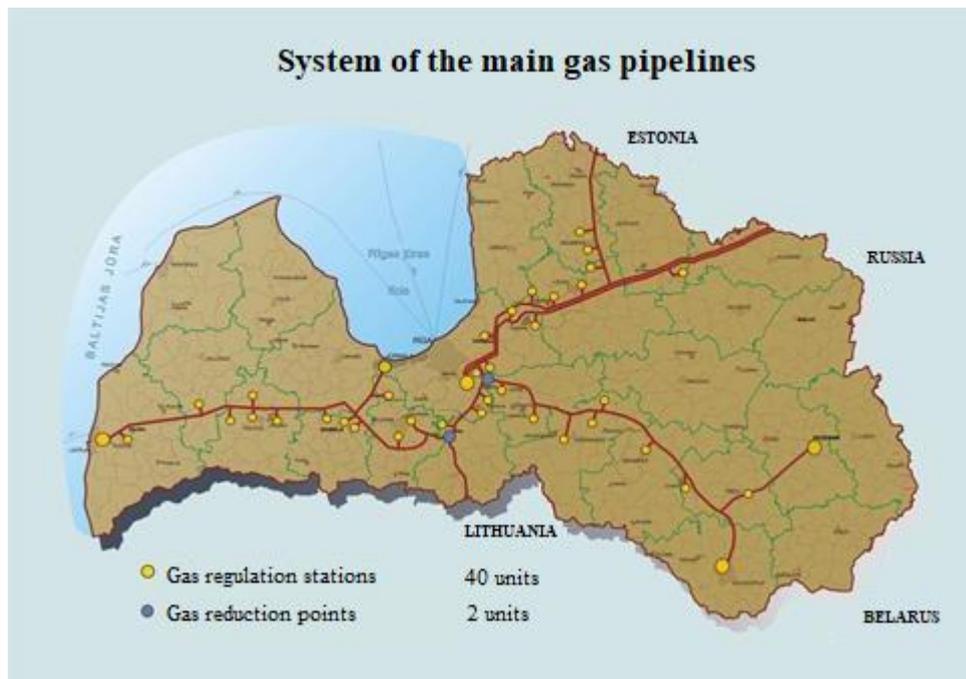
The transmission infrastructure of natural gas of Latvia incorporates in the natural gas transmission system of the Baltic States. The existing cross-border transmission system of natural gas provides an opportunity to receive natural gas from Russia through cross-border transmission gas pipelines Valday–Pskov–Riga and Izborsk–Inčukalns UGSF. The supply of natural gas in the direction from Pskov to Riga is ensured with two parallel gas pipelines between which there are connecting lines.

In order to ensure stable supply of natural gas to Riga city and its surrounding territory – in Mārupe, Babīte, Stopiņi, Ķekava, Ādaži, and Carnikava municipalities –, as well as the potential increase in flow of natural gas, significant investments for the stabilisation and safe operation of the natural gas pressure of the current distribution system were made in the time period from 2006 to 2010.

In line with the technical policy of *Latvijas Gāze AS*, from the year 2000 medium pressure $P < 0.01$ MPa and medium pressure $P < 0.4$ MPa distribution gas pipeline systems have been constructed in individual building territories, and high pressure $P < 1.6$ MPa distribution gas pipeline systems have been constructed in industrial territories which may ensure the operation of the potential micro-generation and cogeneration installations from the existing distribution gas pipeline system. *Latvijas Gāze AS* has invested 65 mill. euros in construction of new distribution gas pipelines, constructing 4950 km of distribution gas pipelines from which connections to 40.85 thousand customers are ensured which is approximately 50 % of all possible connections to the newly-constructed distribution system.

Within the last 15 years the most substantial number of requests and accordingly also connections is in the territories of Riga region – in Mārupe, Ķekava, Carnikava, Stopiņi, Ādaži, Olaine, Jūrmala where the largest investments in the development of the distribution network have been made.

In 2014, new connections were constructed for 1211 customers, whereas the capacity was increased for 435 customers, connecting and increasing the capacity for 1646 customers in total. In 2014, 31.3 km of new distribution system gas pipelines were constructed, and the total investments reached 1.2 mill. euros. The structure of new connections in 2014 was as follows: individual houses – 64 %, commercial customers – 17 %, apartments with heating – 11 %, industrial customers – 5 %, apartments with stoves (fireplaces) – 3 %.



Source: *Latvijas Gāze AS*

Figure 21. Natural gas transmission system in Latvia

The transmission system ensures the supply of the largest cities of the State with natural gas to full extent, upon existing of a section that connects the natural gas transmission and distribution systems – reserves of the flow capacity of gas regulation stations.

In order to improve the supply of natural gas and to increase the safety of the natural gas supply, the *Latvijas Gāze AS*, since its privatisation in 1997, has modernised the natural gas supply system, altogether investing 270.4 mill. lats (384.7 mill. euros). In 2013 implementation of the project Increasing of Two-way Flow of Natural Gas between Latvia and Lithuania was completed within the framework of the European Energy Programme for Recovery. During the implementation of the project, construction of a new underwater crossing of River Daugava was carried out in Latvia, 17 boreholes in Inčukalns UGSF were reconstructed, and a new point for the chamber of acceptance of cleaning and intellectual pistons was established for the diagnostics of pipelines, modernisation of the gas compression station of Panevėžys and modernisation of gas pipelines was carried out in Lithuania. The European Energy Programme for Recovery granted 7.5 mill. euros for the reconstruction of 17 boreholes of Inčukalns UGSF and 2.5 mill. euro for the construction of an underwater crossing under River Daugava and the construction of a new point of acceptance of the pipeline maintenance facility. As a result of implementation of the project Increasing of Two-way Flow of Natural Gas between Latvia and Lithuania, the natural gas pumping capacity of Inčukalns UGSF was increased from 24 mill. m³ per day to 30 mill. m³ per day, and the capacity of interconnection of Latvia–Lithuania was increased up to 6 mill. m³ per day.

As regards the development of the natural gas infrastructure, the limited natural gas market of the Baltic States and, where the project does not have an investment support, also the reimbursement possibilities of the project should be taken into account. In order to ensure the energy independence also in relation to the supplies of natural gas, several significant projects for the infrastructure of interconnections were identified for the first PCI list within the framework of BEMIP in the Baltic region, for example:

- construction of a gas interconnection of Poland–Lithuania (hereinafter – the GIPL);
- improvement of the gas interconnection of Latvia–Lithuania;
- regional LNG terminal;
- expansion and modernisation of Inčukalns UGSF;

– improvement of the gas interconnection of Latvia–Estonia.

The objective of the GIPL project is to connect the isolated natural gas market of the Baltic States with the natural gas market of the EU, providing access to the natural gas trading platforms of the EU (for example, gas trading platform of Central Europe), as well as to the global LNG market. Implementation of the project will promote the safety of natural gas supply in the region. Developers of the project are the transmission system operator of Lithuania *Amber Grid* and the transmission system operator of Poland *GazSystem S.A.* Feasibility study of the GIPL was completed in May 2013. The project has been included in the PCI project list, and CEF financing has been granted for its implementation. The initial planned capacity of the interconnection will be 2.4 bill. m³ with the possibility of increasing, the foreseeable costs – 558 mill. euros. Another BEMIP project – construction of the Świnoujście LNG terminal in Poland which was completed in autumn of 2015 – is also closely related to the GIPL.

From the point of view of the interests of Latvia, it is important to increase the capacity of the gas interconnection of Latvia–Lithuania for the complete use of the gas interconnection of Poland–Lithuania (GIPL). The second stage is related to the construction of the pipeline Iecava–Lithuanian border (planned costs 31 mill. euros).

As regards the establishment of the regional LNG, Latvia is interested in the establishment of such regional LNG terminal which ensures diversification of the supply routes and sources of natural gas in the State and throughout the Baltic region and the operation of which is economically justified. Results of the study commissioned by the EC show that the best site for the regional LNG terminal is in the Gulf of Finland. It is important for Latvia that the regional LNG project ensures an actual diversification of supplies in the most economical way possible.

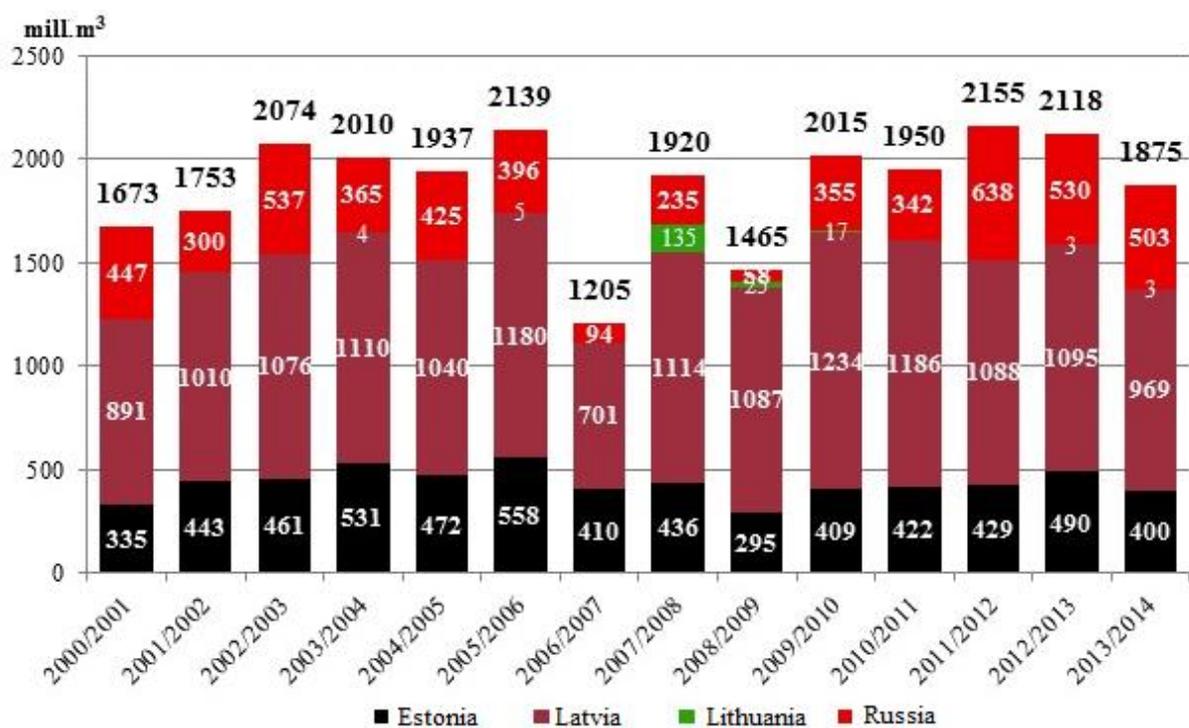
An alternative natural gas supply route, starting from 2015, in Latvia is from Klaipėda LNG terminal. Klaipėda LNG terminal has commenced operation and will be able to provide up to 75 % of the total consumption of natural gas in the Baltic. The capacity of the terminal is four billion cubic metres per year. Whereas the total consumption of Lithuania, Latvia, and Estonia within a year is almost five billion cubic metres.

In 2014 the capacity of the interconnection of Lithuania–Latvia was 6 mill. m³ per day upon the daily consumption of natural gas in Latvia in winter being 12.14 mill. m³ per day. In turn, in autumn 2015 a project was completed which provides for increasing the input capacity of the gas interconnection of Klaipėda–Kuršėnai up to 12 mill. m³ per day.

Inčukalns UGSF is one of the most important elements of the natural gas infrastructure. It is an electricity supply object of strategic importance, and in accordance with Section 20 of the Energy Law the underground part of the UGSF should be preserved in the State ownership.

Inčukalns UGSF may hold up to 2.32 bill. m³ of active gas, and with its assistance variations in demand may be balanced not only in the Baltic States, but also in the north–western region of Russia. During the winter period consumers in Latvia receive natural gas only from Inčukalns UGSF. Also natural gas is supplied to consumers in Russia, Estonia, and periodically also in Lithuania.

The division of natural gas supplied from Inčukalns UGSF among consumers in the three Baltic States and in Russia in the time period from 2000 to 2014 is presented in Figure 22. In this period the majority of natural gas from Inčukalns UGSF is supplied to Latvia, Lithuania, Estonia, and Russia.



Source: *Latvijas Gāze AS*

Figure 22. Supplies of natural gas from Inčukalns UNGF in the time period from 2000 to 2014, mill. m³

Inčukalns UNGF has the possibility to expand in the future and thus store more gas. The storage of the amount of active natural gas can be increased from 2.32 bill. m³ to 2.6–2.8 bill. m³. After expansion the amount of supply of natural gas would also increase from 28–30 mill. m³ per day to 34–35 mill. m³ per day.

The gas supply interconnections planned in the Baltic Sea Region in 2020 are presented in Figure 23.

In addition to Inčukalns UGSF there are also other sites in Latvia which can be potentially used for the storage of natural gas and which may obtain additional significance after construction of interconnections with the EU networks. Access to and sufficiency of UGSFs in the region is important because UGFs significantly improve safety of the natural gas supply and allow to regulate the natural gas supply depending on the season.



Source: ENTSOG

Figure 23. Infrastructure of gas supply planned in the Baltic Sea Region in 2020

In total there are at least 11 underground structures in Latvia which have been recognised as perspective for further study (see Figure 24 and Table 4).

Table 4.

Geological structures of Latvia which are appropriate for the establishment of underground gas storage facilities

Underground gas storage facility	Area, km ²	Capacity, bill. m ³
Snēpele	75	17.5
Aizpute	95	16.0
Dobele structure	47	7.74
N-Blīdene	47	9.0
Līči	65	2.5
Liepāja	39	2.5
Degoles	46	3.5
Līgas	40	2.5
N-Līgatne	3x8	2.5
Amatas	5x5	2.0
Valmiera	3x10	2.5

Of all the potential UGSFs of Latvia, Dobele underground structure is the one explored in the most detail and has been recognised as appropriate for the establishment of a natural gas storage facility. Within the framework of the project Geological and Economic Exploration of Possible Establishment of Natural Gas Underground Storage Facility in Latvia, Dobele District co-financed by the EU (foreign financial assistance European Community Aid to Networks of the Transport, Telecommunication and Energy Infrastructure) it was recognised that in potential case of establishment of USGF of Dobele structure it would be one of the largest UGSFs in the EU countries as regards capacity.



Source: *Latvijas Gāze AS*

Figure 24. Layout of the existing and potential underground gas storage facilities of Latvia

Dobele structure was recognised as appropriate for the establishment of a natural gas storage facility. Its capacity is approximately 7.74 billion m³, however, the most optimistic estimates show that the total capacity of the constructed UGSF of Dobele structure might reach 20 billion m³ of natural gas (of them 10 billion m³ of buffer gas). However, the real natural gas storage capacity of Dobele structure could be 10 billion m³ of natural gas (5 billion m³ of active gas). In such case, 80 deep boreholes should be drilled. The total investments in the establishment of the UGSF of Dobele structure are estimated to be in the amount of approximately 1.3 billion euros.

3.3.3. Transport Recharging/Refuelling Infrastructure

On 22 October 2014 the EC presented a new Directive 2014/94/EU on the deployment of alternative fuels infrastructure. This Directive establishes a common framework of measures for the deployment of alternative fuels infrastructure in the EU in order to minimise the dependence on oil and to mitigate the environmental impact of transport. This Directive also sets out minimum requirements for the construction of alternative fuels infrastructure, including recharging points for electric vehicles and refuelling points for natural gas (LNG and CNG) and hydrogen, to be implemented by means of Member States' national policy frameworks, as well as common technical specifications for such recharging and refuelling points, and consumer information requirements.

Member States must ensure that, by 31 December 2020, an appropriate number of refuelling points for compressed natural gas accessible to the public are deployed in order to ensure that motor vehicles powered by it may circulate in agglomerations of cities/suburbs and other densely populated areas, and in the appropriate cases within the networks determined by Member States.

Member States must ensure that, by 31 December 2025, an appropriate number of refuelling points for LNG and compressed natural gas accessible to the general public are deployed at least in the existing TEN-T principal network to achieve that the motor vehicles powered by LNG and compressed natural gas may circulate within the whole EU. In addition to that Directive 2014/94/EU determines that Member States shall ensure, by means of their national policy frameworks, that an appropriate number of refuelling points for LNG are deployed in maritime ports and inland ports by 31 December 2025 in order to enable the LNG inland waterway vessels or seagoing ships to circulate throughout the TEN-T Core Network.

Innovative solutions have been developed in Latvia to ensure the use of compressed natural gas in transport, including also in the field of motor transport refuelling technologies. The refuelling facility for compressed natural gas which takes natural gas from the connection point of the natural gas distribution network, compresses it, and fills in the fuel tank of motor transport, can be named as an example. This technology has been created and successfully tested within the framework of a pilot project in Latvia. The mobile refuelling system for compressed natural gas included in the pilot project is intended for simultaneous (parallel) refuelling of buses powered by compressed natural gas which are in the Jūrmala Bus Park. According to the data provided by the project, the use of the mobile refuelling station for compressed natural gas has provided savings of financial resources in the amount of 40 % compared to the costs of diesel fuel.

Innovative solutions in the field of compressed natural gas refuelling might serve as the basis for the establishment of public fixed refuelling stations for natural gas which would offer to refuel the transport with compressed natural gas. Moreover, the deployment of such technology in Latvia would allow to place the refuelling stations for compressed natural gas in locations where there is no access to the natural gas distribution network.

One of the challenges is the construction of a uniform infrastructure of electric recharging stations in accordance with the Electric Mobility Development Plan for 2014–2016 that has been approved in the State by the Cabinet Regulation No. 129 of 26 March 2014. In order to provide an easy-to-use public recharging infrastructure for electric vehicles, it should consist of fast and medium fast recharging stations that would be equipped with car identification, smart electricity metering and centralised data accumulation infrastructure for optimal organisation of payments for the charging service. Considering the foreseeable number of electrical vehicles to be registered in the State, in accordance with the Electric Mobility Development Plan approximately 235 such recharging stations should be established by 2020. When planning the construction of recharging stations, the location of the existing distribution electricity network and available capacities should also be taken into account in order to use the existing infrastructure efficiently and to optimise the construction costs of the recharging infrastructure.

3.4. Heating Supply

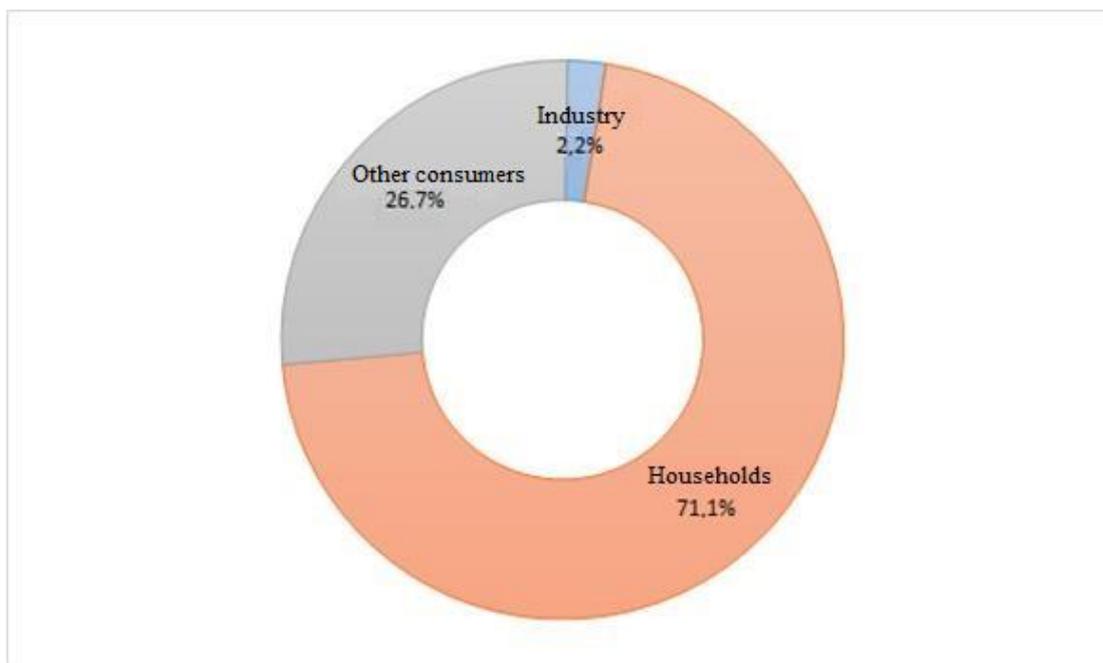
In Latvia heating supply is provided through the use of centralised heating supply systems, local heating supply, and individual heating supply. Heating supply is organised by local governments within their administrative territories in accordance with the autonomous function laid down for them in the law.

The objective of the centralised heating supply system is to provide the necessary amount of thermal energy to inhabitants, as well as commercial and industrial consumers through the use of modern and sustainable heating supply technologies, to ensure the

competitiveness and safety of such technologies and good quality service level to consumers by introducing sustainable technological solutions in all stages of heating supply – the source, heat networks, and at the final consumer.

In 2013 centralised thermal energy for sale was generated in 638 boiler houses and 166 cogeneration plants which in total generated 7.29 TWh of centralised thermal energy for sale.

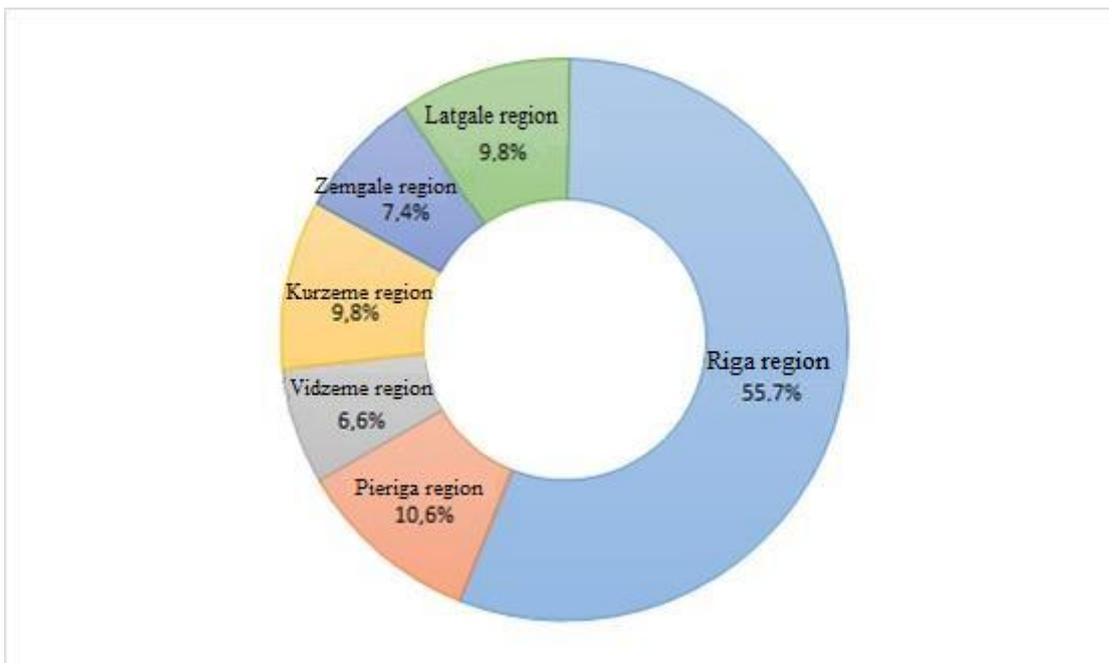
The structure of consumers of the centralised heating supply which is presented in Figure 25, has not changed during the last years. The largest consumption of thermal energy in 2013 was for households – 71.1 % of the total final consumption of centralised thermal energy.



Source: CSB

Figure 25. Final consumption of centralised thermal energy, 2013

In turn, in division according to regions Riga region with 55.7 % consumes more than half of the centralised thermal energy in the country (see Figure 26). The majority of the volumes of thermal energy generated in centralised heating supply systems is generated in Riga, mainly in highly efficient cogeneration process. *Rīgas siltums AS* is the largest undertaking of centralised heating supply in Latvia and the Baltic States.

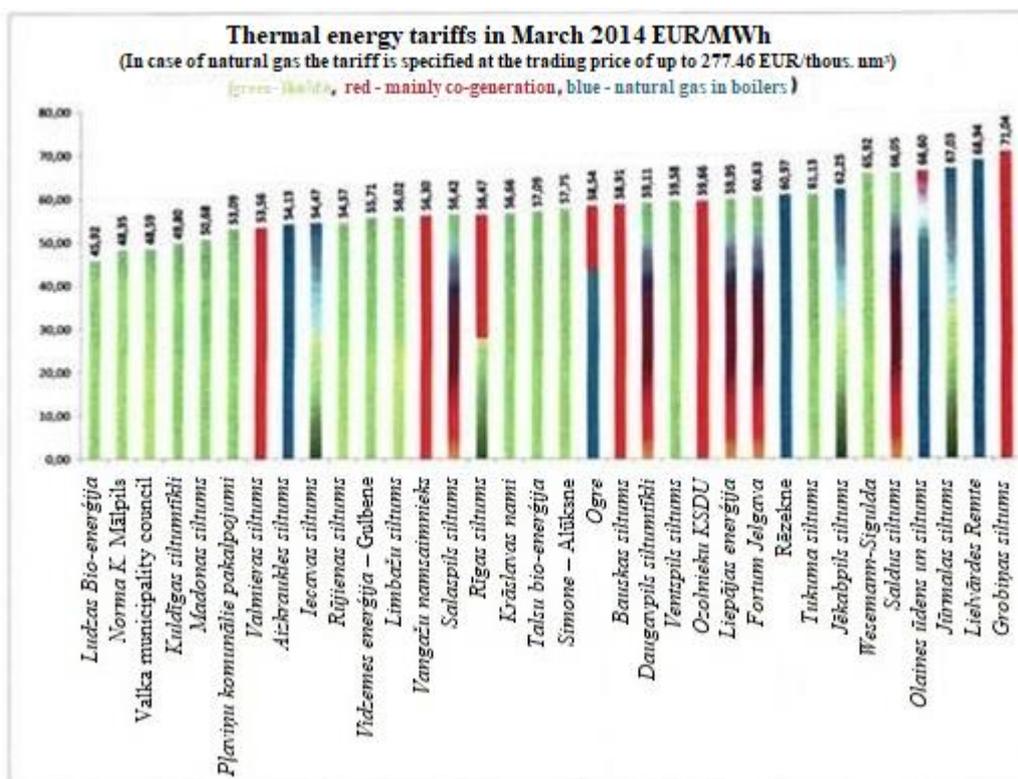


Source: CSB

Figure 26. Division of final consumption of centralised thermal energy according to regions in 2013

According to the information provided by the Latvian Association of Heat Undertaking, thermal energy tariffs differ significantly in different local governments in Latvia (see Figure 27). In 2014, one of the lowest tariffs were in Ludza town, Mālpils municipality, Valka municipality, Kuldīga town where the final consumer paid up to 50 euros per MWh. In turn, one of the highest tariffs were in Saldus town, Olaine town, Jūrmala city, Lielvārde municipality, and Grobiņa municipality where more than 65 euros were paid per MWh. These differences in thermal energy tariffs are determined by different factors, for example:

- the type of fuel used as the costs of fuel amount to 90 % in the variable costs of thermal energy generation;
- the size and technical condition of the heating supply system;
- the heat load density, i.e., the rate between thermal energy consumption and the size of the territory covered by the heating supply system;
- conformity of the capacity of the centralised heating supply system with the requested load.

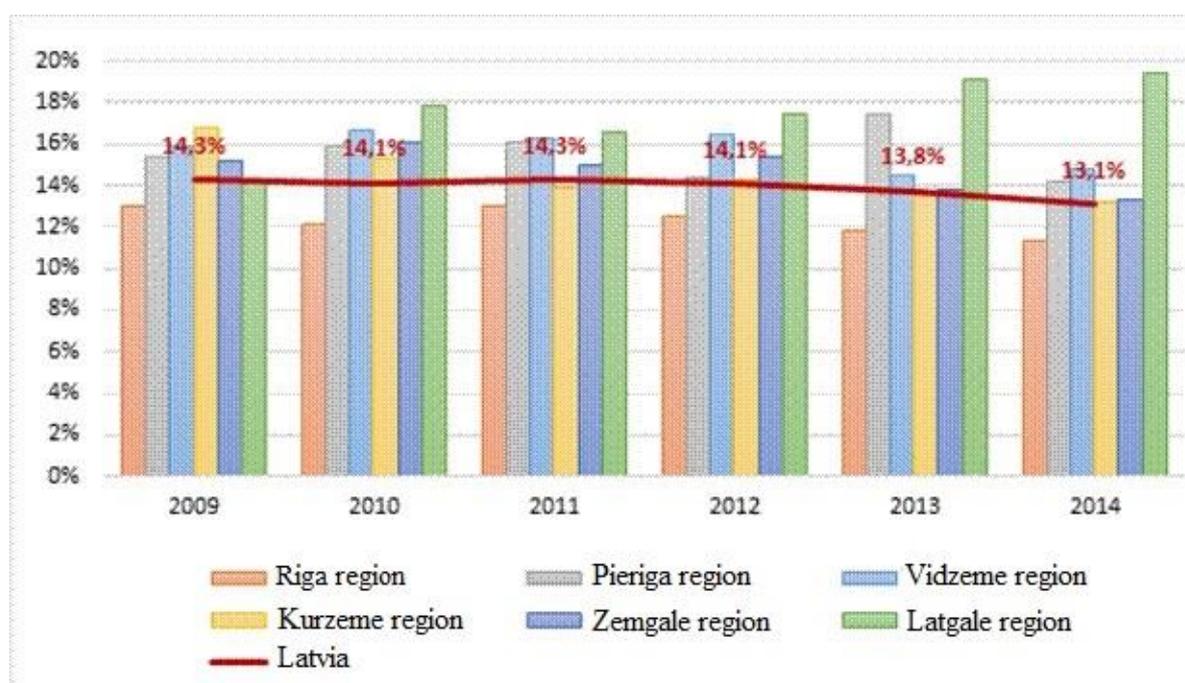


Source: Latvian Association of Heat Undertakings

Figure 27. Thermal energy tariffs in March 2014, euros/MWh

Differences between the highest and lowest thermal energy tariffs are gradually decreasing. In most cases, the lowest tariffs could be increased in the future as they might not cover costs of thermal energy generation and supply, whereas the highest tariffs could be decreased due to significant optimisation measures of heating supply systems of cities being implemented. In order to reduce the difficulties of covering the housing costs, the State inhabitants need complex measures which would also improve the social security system, including the social assistance system in relation to provision of support to poor and low income families and persons in solving the issue of an apartment.

Thermal energy transmission is one of the most important heating supply stages which significantly affects efficiency of the common system and causes additional costs compared to the individual and decentralised heating supply. The energy efficiency measures taken in the last years have allowed to reduce the thermal energy losses in networks, for example, in Riga up to 13 % (see Figure 28). More rapid implementation of measures for increasing energy efficiency in centralised heating supply is hindered by the missing amount of investments, the limited ability of local governments to take a credit, as well as the slow speed of capital turnover. Due to these reasons local governments keep operating inefficient facilities which increases the consumption of heating fuel and are not able to provide heating supply in the necessary quality. The energy generation process can be optimised and losses of thermal energy in transmission systems can be reduced by carrying out complex restoration of the system.



Source: Latvian Association of Heat Undertakings

Figure 28. Average thermal energy losses in Latvia, %

Increase in the capacity of boiler houses using RES in the time period from 2007 to 2013 was promoted by directing not only financial resources from the EU budget, but also the financial resources of the Climate Change Financial Instrument. For example, in 2013 the share of RES in centralised heating supply was 26.8 % and had a tendency of growing slowly, but constantly.

Upon evaluating the perspective of dynamics of RES technology costs, the sectoral development strategy, as well as from the point of view of the system safety, it is preferable to integrate several RES technologies in the centralised heating supply system, more even division of which will generally make the centralised heating supply systems more stable. Therefore, also in the next planning period it is intended to continue to invest the support of the EU funds in the replacement of the heat sources using fossil energy resources with heat sources using RES.

Each EU Member State must carry out an evaluation of high-efficiency co-generation and centralised heating supply in order to ensure efficient use of the remaining heat created in industry and generation of electricity. The objective of evaluation is to ensure that in the future policy makers and decision makers of all levels would identify and take into account the existence or non-existence of the potential of each national country, ensuring efficient use and development of centralised heating supply systems. For Latvia such evaluation will not only give an opportunity to evaluate the potential of centralised heating supply, but will also allow to organise the co-generation field, ensuring sustainable development of heating supply system that is based on market principles.

Latvia holds the third place in Europe after Iceland and Lithuania in the number of inhabitants (%) to whom thermal energy is provided in centralised manner. The challenge of the future centralised heating supply system is related to the preservation and strengthening of this position. Therefore, the next step after evaluation of the cogeneration and centralised heating supply system will be reviewing and organising the existing normative base that governs the field of heating supply, establishing a uniform legal framework with the objective of adapting the existing heating supply model to future challenges, including potential transition from the third generation to the fourth generation heating supply model which is characterised by open transmission networks, collection and accumulation of the remaining thermal energy,

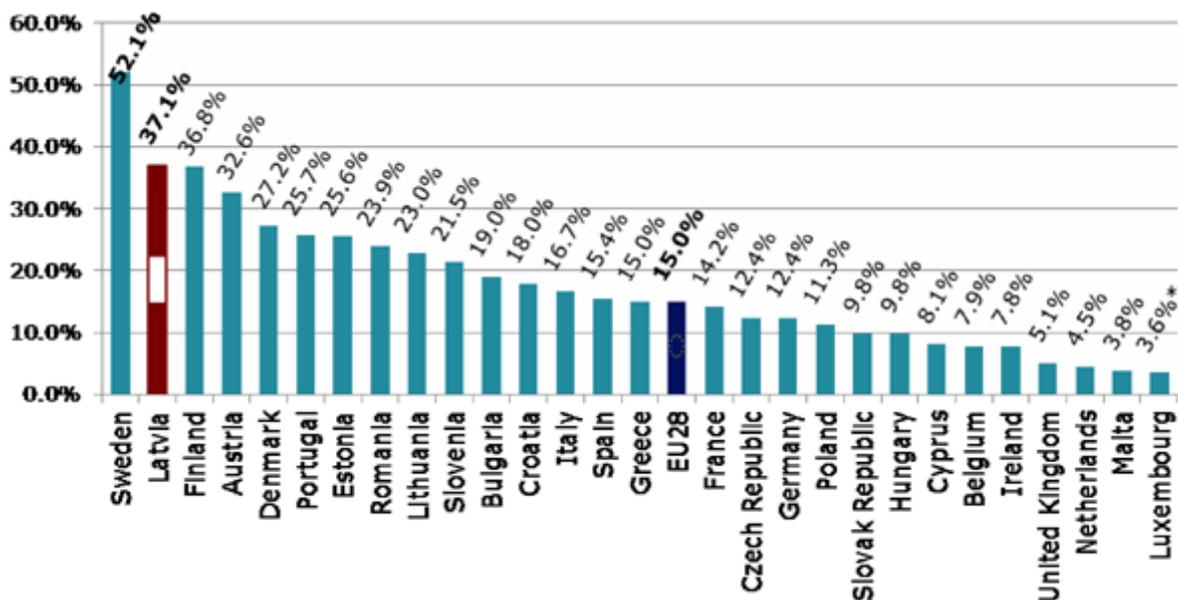
increasing use of RES and other innovative energy sources, strengthening of the role of consumers in the energy market.

By developing the plans and strategies of undertakings for the future development of centralised heating supply system, owners of undertakings should take into account the forecasts of thermal energy demand, costs of available technologies, and the development trends of new technologies, looking at complex and innovative solutions which would be based also on energy savings not only in the infrastructure of the centralised heating supply system, but also at final consumers.

3.5. Renewable Energy Sources

The most important instrument of the EU policy for promoting renewable energy is the RES Directive. It determines the national targets for the share of renewable energy in energy consumption for 2020.

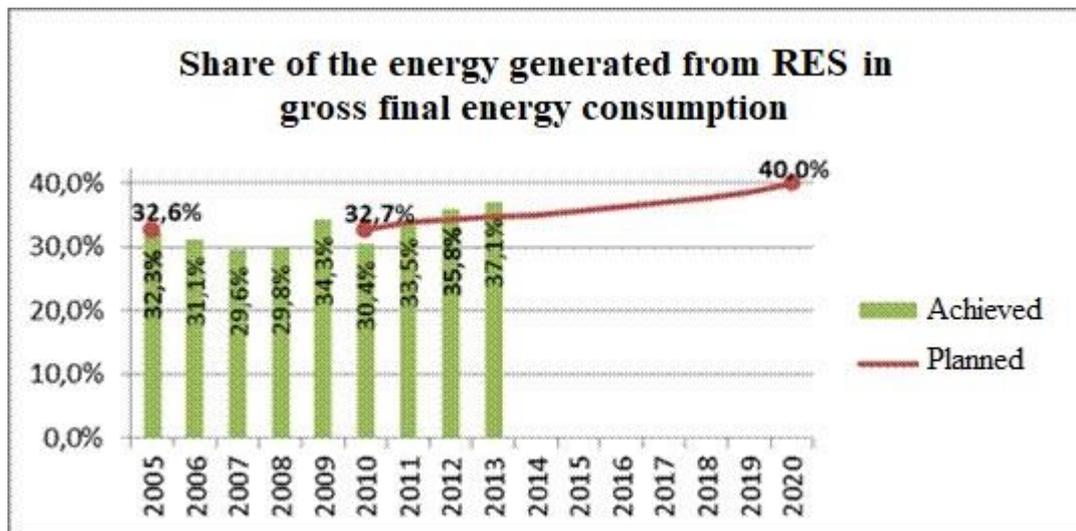
Taking into account that the RES Directive specified specific target for each EU Member State, then the achievements of each EU Member State may be compared in Figure in relation to the achievement of its national RES target. According to the evaluation²⁴ of the European Commission seven (including France, Luxembourg, Malta, Netherlands, Great Britain, Belgium, and Spain) of 28 EU Member States might not reach their specific targets by 2020.



Source: EUROSTAT

Figure 29. Progress of EU Member States in the RES share in gross final energy consumption in 2013

The analysis of the achieved RES share in the total gross final energy consumption of Latvia which has been calculated in accordance with the methodology of the RES Directive shows that in 2011–2012 it was 34.7 % (in 2011 – 33.55 % and in 2012 – 35.78 %). Figure 30 shows the planned trajectory and the values achieved in the gross final energy consumption of the RES proportion.



Source: CSB

Figure 30. Share of the energy generated from RES in gross final energy consumption

According to the CSB data, the net installed electric capacity of electricity plants using RES has increased by 206 MW since 2008, reaching 1780 MW in 2014, including 1590 MW at hydroelectric power plants, 69 MW at wind electric plants, 58 MW at biogas electricity plants, and 63 MW at wood biomass electricity plants. As the capacity of the generated electricity increases, the amount generated thereby increases, for example, the amount generated in 2014, using wood biomass and biogas, increased up to 669 GWh, at wind electricity plants up to 141 GWh, in turn at HPP with capacity up to 10 MW it reached 68 GWh.

The installed thermal energy capacity of heat sources using RES in this period increased by 885 MW, reaching 1951 MW in 2014, including 647 MW in cogeneration plants and 1304 MW in boiler houses.

The practical potential of individual technologies for the generation of electricity, using RES, is lower than the theoretical potential which is proved by the experience gained in the implementation of the previous RES support mechanisms.

For example, the potential of hydro-energy resources of small rivers which can be used in practice and is estimated to be within range of 250 to 300 GWh²⁵ per electricity year is not being realised because, in accordance with the requirements of the applicable legislation²⁶, restrictions were imposed on the construction of small HPPs in order to protect the fish stocks and preserve the biological diversity of rivers.

The wind speed at the coast of Latvia reaches 6–8 m/s which conforms to the level ensuring optimum operation of modern turbines. The average theoretical potential of wind energy per year is from 1000 to 3000 GWh. At the beginning of 2014, the installed capacity of wind energy in the Baltic States reached 657 MW from which 67 MW were installed in Latvia (69 MW at the end of 2014), meanwhile in Estonia – 290 MW, in Lithuania – 300 MW. The potential of wind energy of the Baltics is estimated to be in the range from 4.5 to 7 TWh per year (in Estonia – 4 TWh, in Latvia up to 1.5 TWh, in Lithuania – 1.5 TWh). Wind power is the most widespread and cheapest installed technology generating electricity in 28 Member States of the EU²⁷.

Taking into account that Latvia has undertaken to achieve the RES target of 40 % in the total gross final energy consumption, then in the time period until 2020 additional progress in relation to the RES target of 37.1 % achieved in 2013 will be necessary. In order to achieve the target assigned to Latvia, it will be necessary to use the existing RES potential and to evaluate the additional possibilities offered in the RES Directive (improvement of the net metering

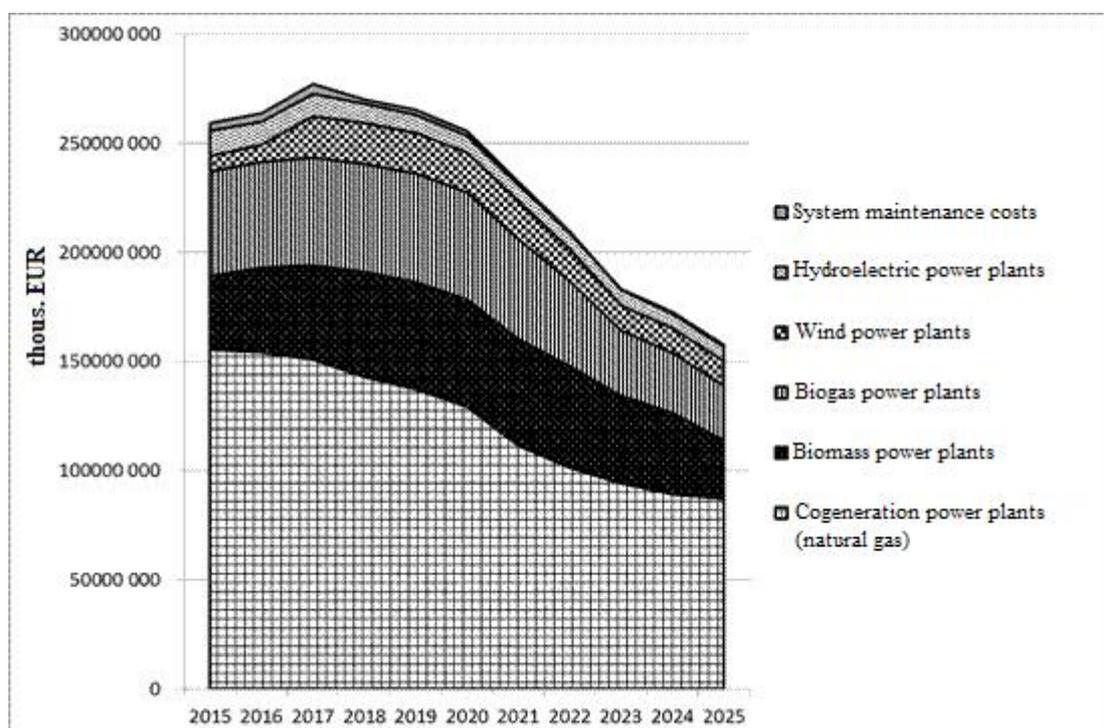
system of electricity, introduction of RES statistical transfer, joint projects, and harmonised State support schemes).

Mandatory procurement and guaranteed payment for the installed electric capacity

The RES Directive prescribes that at the national level the countries may develop different national level State aid measures for the implementation of this policy and form cooperation mechanisms with other EU Member States, as well as prescribes the sustainability criteria for biofuels and biologically liquid fuels. However, the efforts of EU States in establishing State aid mechanisms for the achievement of the targets specified in the RES Directive have shown the necessity to pay more attention to cost-effectiveness, therefore, as a response to this question, the European Commission published the Guidelines on State aid for environmental protection and energy²⁸ and has laid down that the EU Member States must create such State aid mechanisms which are built on market-based principles. At the EU level, discussions on ways how to change the operation of this sector to the market operating principles took place in 2015.

As already mentioned, Latvia has also introduced a State aid mechanism for the promotion of renewable energy – the mandatory procurement and guaranteed payment for the installed electric capacity. In Latvia, the costs arising from supporting electricity generated from RES or in high efficiency co-generation are covered by all final electricity consumers of Latvia in proportion to the electricity consumption, as the price includes the MPC. If the MPC calculated in 2008 was 0.80 cents/kWh, then from 1 April 2010 the MPC calculated by the Public Utilities Commission was 1.63 cents/kWh. In 2012, the MPC had risen to 1.75 cents/kWh and in 2013 – to 2.69 cents/kWh. Compared to 2008 when the MC support mechanism started operating, the MPC has increased by 1.89 cents/kWh or 3.3 times. In comparison with the neighbouring countries, in 2013 the MPC formed 2.72 cents/kWh in Lithuania and 0.87 cents/kWh in Estonia.

Changes in the amount of the MPC according to years without a subsidy from the State budget according to the forecasts of the public trader which have been developed in cooperation with independent experts of the energy sector, are presented in Figure 31.



Source: *Enerģijas publiskais tirgotājs AS*

Figure 31. Projected aid costs above the market price broken down by the types of resources

The MPC directly depends on the actual costs of the previous calendar year that were above the market price and the guaranteed payment for the installed electric capacity. The increase is projected to reach its maximum in 2017. In turn, if issuance of new permits is not re-commenced, then starting from 2017 the MP will start to decrease (see Figure 31). These projections take into account that new biomass and biogas cogeneration plants with the potential installed capacity of 24.4 MW and wind power plants with capacity of 57 MW will be accepted into operation until 2018, and it will basically be the grounds for increase in the MPC.

The information included in Table 5 shows that the total amount of aid disbursed to the producers which sell electricity within the framework of MP or receive the guaranteed payment for the installed electric capacity, as well as the amount of such aid above the market price which is included in the MPC increases each year.

Table 5.

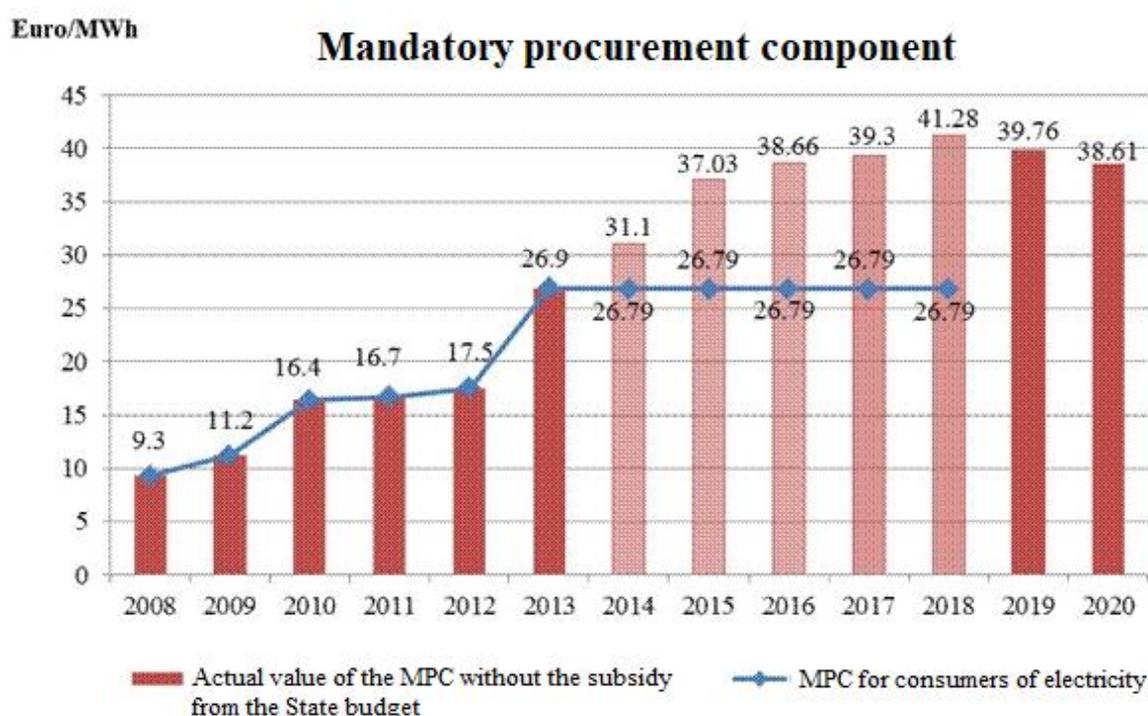
Amount of electricity procured within the framework of the mandatory procurement and the costs of aid

	Procured amount of electricity, GWh			Aid disbursed to producers, mill. euros			Amount of aid above the market price, mill. euros		
	2013	2014	1 st half year of 2015	2013	2014	1 st half year of 2015	2013	2014	1 st half year of 2015
RES	613.6	685.3	417.6	104.29	116.73	69.50	73.98	83.07	53.96
<i>Biogas power plants</i>	281.9	335.5	186.3	53.35	62.39	33.91	39.25	45.64	26.89
<i>Biomass power plants</i>	163.1	195.3	131.10	28.56	32.92	20.99	20.42	23.24	16.10
<i>Wind power plants</i>	109.6	87.8	48.4	11.71	9.42	5.27	6.46	5.36	3.55
<i>Hydroelectric power plants (up to 5 MW)</i>	59.0	66.6	51.7	10.67	12.00	9.32	7.85	8.83	7.42
Fossil cogeneration plants	1996.1	598.3	335.1	236.99	79.23	42.26	135.92	49.72	29.67
Capacity fee (RES)	n/a	n/a	n/a	1.29	5.16	2.58	1.29	5.16	2.58
Capacity fee (fossil cogeneration plants)	n/a	n/a	n/a	0	107.78	53.93	0	107.78	53.93
In total	2609.7	1283.6	752.6	342.58	308.90	168.27	211.19	245.74	140.15

Source: Ministry of Economics

The amount of aid above the market price in 2014 has increased by 12.3 % (from 73.98 mill. euros to 83.07 mill. euros) for producers which generate electricity from the RES and sell it within the framework of the MP, in comparison with 2013, in turn in the 1st half year of 2015 it amounts to 65 % of the amount of aid above the market price disbursed in 2014. Also the amount of aid above the market price disbursed to cogeneration plants which use fossil energy resources for the generation of energy increases, having increased by 15.9 % (from 135.92 mill. euros to 157.50 mill. euros) in 2014 compared to 2013, whereas in the 1st half year of 2015 it amounts to 53 % of the amount of aid above the market price disbursed in 2014.

Taking into account the abovementioned, the Cabinet, upon becoming acquainted with the conceptual report Complex Measures for the Development of the Electricity Market²⁹, decided to retain the MPC in the amount of 26.79 euros/MWh until 2019 (see Figure 32). In order to compensate for the difference between the actual MPC and the MPC approved by the Cabinet, the financing will be provided by the income from the subsidised energy tax (hereinafter – the SET), the value added tax, and the dividends of the *Latvenergo* AS. Concurrently, amendments to the laws and regulations governing the MP were prepared in 2015 in order to extend the moratorium after 1 January 2016 during which the MoE does not issue new rights to receive State aid.



Source: MoE

Figure 32. Dynamics of the mandatory procurement component

Aid to energy which is generated from RES or in high efficiency co-generation is identified as one of the factors which affects international competitiveness of energy-intensive undertakings. In order to address this problem and to ensure international competitiveness of undertakings belonging to energy-intensive sectors, Cabinet Regulation No. 395 of 14 July 2015, Procedures by which Energy-intensive Manufacturing Undertakings shall Obtain the Right to Reduced Participation for the Mandatory Procurement Component Payment, was adopted, allowing the energy-intensive manufacturing industry merchants to apply for a reduced MPC participation payment starting from 1 July 2015. The abovementioned regulations shall come into force only after entering into effect of an EC decision on the conformity of the measure with the internal market of the EU.

Therefore, the merchant will be entitled to receive a reduced MPC participation payment, if its electricity consumption in one year in one place of connection will be in the amount of 10 GWh. The merchant must meet the following criteria:

1) the share of electricity costs in the gross added value in the previous year must reach 20 %;

2) the merchant must have introduced an energy management system which conforms to the standard LVS NE ISO 50001:2012, Energy management systems – Requirements with guidance for use (ISO 50001:2011);

3) it must conduct its business in specific sectors which are energy intensive, for example, metallurgical industry, fiberglass, generation of cement, generation of electrical installations.

The next challenge for the promotion of renewable energy is the reformation of the measures promoting aid (exemption from the electricity tax for RES and cogeneration, application of reduced excise duty rates to fuels with high admixture of biofuels). Taking into account the further dynamics of the development of energy generated from the RES which is affected both by the consumption of energy and the results of the implemented State aid measures, and the impact of the existing aid mechanisms on national economy, it is necessary to agree on such aid mechanism which not only would be oriented towards the achievement of the RES target, but also would have the least impact on the growth of national economy and solvency of households.

In order to ensure that energy is generated by making the maximum use of cost-efficient technologies, aid measures must be technologically neutral.

Considering the trends existing in the sector of renewable energy and the decrease in the costs of technologies in the world, it would be necessary to establish such aid mechanism which would respond to the requirements of the energy market. The core principles of the aid mechanism should be based on the following conditions:

- aid is a feed-in-premium, and the electricity producer sells electricity directly on the market;
- an obligation is imposed on aid recipients in relation to the balancing services, except if a liquid intraday market does not exist;
- aid is not provided if energy is generated at negative price³⁰.
- constant monitoring process is ensured in order to provide efficiency of the aid mechanism.

Considering that aid for the promotion of renewable energy is an issue of the internal market of the EU, then before the introduction of the aid mechanism a decision of the EC on conformity with the requirements of the internal market of the EU will be necessary.

Subsidised electricity tax

In order to preserve aid for the generation of electricity, using RES or high efficiency co-generation facilities and precluding a significant increase in the MPC, and keep it at the level of 2013 (26.79 euros/MWh), SET has been introduced. The Subsidised Electricity Tax Law was adopted by the *Saeima* of the Republic of Latvia on 6 November 2013 and came into force on 1 January 2014.

The Subsidised Electricity Tax Law provides for the application of the SET from 1 January 2014 to 31 December 2017. Three different rates have been laid down for this tax:

- 15 % for natural gas cogeneration plants;
- 10 % for plants using RES;
- 5 % for plants which conform to specific conditions³¹.

Introduction of the SET was necessary to preclude an increase in costs both for consumers of electricity and the State budget which may endanger aid to environment-friendly generation of electricity in the current amount. Moreover, it should be taken into account that costs for the generation of electricity from technologies used by RES decrease over time, upon increase in its deployment.

Share of the energy generated from RES in transport

As other EU Member States, Latvia must achieve the 10 % share of the energy generated from RES in the final energy consumption in transport by 2020. In 2011, Latvia achieved the share of 3.24 % RES energy in the transport sector, in 2012 – 3.10 %, in 2013 – 3.08 %. Achievement of this target for Latvia is related to technological challenges (it is affected by the out-of-date car park, as well as reduction in consumption of fuel at large), and also the public habits of choosing and using vehicles which has a direct impact on the structure of energy consumption in the transport sector.

The most widely known types of first generation fuel are bioethanol and biodiesel fuel, however, also pure vegetable oil is used as a motor fuel in the world.

Crops – wheat, rye, and triticale – are used for the production of bioethanol in Latvia, and canola – for the production of pure vegetable oil and biodiesel fuel. Part of the biofuel produced in Latvia is brought out to Mažeikiai oil processing factory where biofuel is mixed with fossil fuel according to the requirement of Latvia that the fossil fuel can only be sold with 5 % admixture of biofuel, and afterwards is brought back for selling on the market of Latvia.

The share of biofuel in consumption of primary energy resources of Latvia in 2014 was small and amounted only to 1.0 PJ which is by 10 and 0.06 PJ more than in 2012 and 2013 accordingly.

Currently second generation biofuels which are produced from waste, residues, non-food cellulose raw materials, and lignocellulosic raw materials are not being produced and used in Latvia.

In order to promote the consumption of biofuel in Latvia in accordance with the conditions of the Biofuel Law, mandatory 5 % admixture of biofuel to fossil fuel was introduced from 1 October 2009.

The current development of the biofuel generation sector in Latvia and the analysis of efficiency of State aid instruments³² shows that the increase in demand is best stimulated by policy instruments directly related to consumption, therefore, it would be necessary to promote the use of biofuel with different indirect aid measures. In order to promote achievement of the RES target in the transport sector by 2020, development of the biofuel sector and electrification of the transport sector are the priority action directions.

The only aid measure for the promotion of biofuel is the reduced rate of excise duty B100 which must be coordinated with the European Commission regarding conformity with the requirements of the internal market of the EU. Whereas, as regards the potential future aid measures, there is a possibility of supporting only those merchants which plan reorientation to the generation of the second generation biofuel.

Not only biofuel, but also electrification of the transport sector contributes to achievement of the RES target in transport, for example, development of the tramway and trolley bus network, electrification of the railway network, electric mobility. Therefore, Latvia plans to implement several measures for the development of environment-friendly transport until 2020, starting from the electrification of the railway of Latvia and ending with the development of zero emission transport in Riga city. Along with the promotion of the use of biofuels and electrification of the transport sector, measures for the reduction of electricity consumption in the transport sector should be promoted.

3.6. Energy Efficiency

Promotion of energy efficiency has a significant role in the energy policy of the EU because it provides a horizontal contribution to reduction of GHG emissions and reduction of fossil energy import. Three main instruments were developed for the implementation of the target set forward in the European Council of March 2007 (to increase energy efficiency by 20 % until 2020):

- Directive on the energy performance of buildings³³ is a targeted instrument for the improvement of energy performance in the sector of buildings which provides for the

specification of the minimum standards for the energy performance of buildings for new and restored buildings and their parts, as well as for the introduction of a national level requirement to move towards buildings of almost zero energy level.

- Energy Labelling Directive³⁴ and Ecodesign Directive³⁵ lay down the general requirements for labelling of goods and the minimum indicators of energy efficiency.

- Energy Efficiency Directive³⁶ lays down that an energy efficiency target of the EU is to achieve that the EU Member States do not consume more than 1474 Mtoe of energy in total in 2020, specifying an indicative target of primary energy savings for each country. Directive also lays down a range of sub-targets: a mandatory savings target of final energy consumption for each country, an obligation for the country to renovate 3 % of area in buildings in the ownership and use of the State.

According to the EC report³⁷ it will be possible to increase energy efficiency by 18-19 % in 2020. The Energy Efficiency Directive³⁸ includes measures which encompass the whole chain of energy supply, including generation, transmission, and distribution of energy, and includes the important role of the public sector in the field of energy efficiency, buildings and appliances, industry, as well as the necessity to provide an opportunity for final consumers to manage their own consumption.

High efficiency co-generation and centralised heating supply and cooling has a significant potential of primary energy savings. Therefore, the Energy Efficiency Directive assigns the countries to carry out the cost-benefit evaluation of the potential of high efficiency co-generation and centralised heating supply and cooling. If cost-efficient potential in industry or generation of electricity is found in the country for the use of the remaining heat, the new facilities and installations for the industry and generation of electricity which are significantly modernised on the basis of a positive benefit analysis, must be equipped with high efficiency cogeneration installations in order to utilise the remaining heat.

The EC has calculated that electricity consumed for cooling in the residential sector is only 1 % of the total energy consumption, however, this indicator is 9 % in the service sector. It means that the energy consumed for cooling in the EU forms a small part of the total energy consumption which can be explained also by the climatic conditions of the EU states. In majority of cases consumption of electricity for cooling is not individually metered, therefore, it is difficult to determine how much electricity is consumed for cooling and what is the quantity of electricity saved, if measures for the improvement of energy efficiency are implemented within the cooling system.

Energy consumed for cooling is affected by many factors, for example, heat permeability of building envelopes, efficiency of cooling units, climate, income and behaviour of inhabitants. By implementing measures for the improvement of heat permeability of building envelopes, procuring more energy efficient cooling units, and changing the habits of inhabitants in use of cooling energy, energy savings may be achieved similarly as they are achieved in relation to consumption of thermal energy.

Within the framework of the Energy Labelling Directive and the Ecodesign Directive³⁹ implementation/delegated acts prescribing specific efficiency requirements for specific groups of goods⁴⁰ are being developed. Market supervision of the fulfilment of the energy efficiency and energy labelling requirements in Latvia is carried out by the Consumer Rights Protection Centre (CRPC).

Appropriate activities of supervisory authorities (including efficient cooperation in cross-border context) is one of the most significant tools to ensure correct implementation of energy labelling and ecodesign norms, preventing violations on the market, ensuring fair competition and motivation for undertakings to carry out innovations, and generally striving for maximum energy savings. The report on application of the Energy Labelling Directive and specific aspects of the Ecodesign Directive⁴¹ concluded that the EU incur significant losses⁴² due to insufficient enforcement measures (market supervision).

Taking into account the applicable regulation, the process of developing and adopting new regulations in the field of ecodesign and energy labelling⁴³, as well as regular monitoring by the EC of the measures implemented by the market supervisory authorities of Member States referred to in the Ecodesign Directive and the Energy Labelling Directive, it is anticipated that in order to conform to the requirements and to improve the application of the ecodesign and energy labelling requirements to different groups of goods, the Consumer Rights Protection Centre (CRPC) will need additional resources from the budget for strengthening the administrative capacity.

Energy efficiency in generation, distribution, and transmission of electricity

Efficiency of electricity generating has been significantly increased by the reconstruction of Rīga 1 and 2 thermal power plants. During reconstruction of Rīga 1 thermal power plant, the old equipment was replaced with new highly efficient and environmentally friendly equipment. As a result of reconstruction the possibility to generate an amount of electricity that is three to four times larger in co-generation mode was created, and the coefficient of the use of heating fuel has significantly increased (from 74 % to 87.7 %).

Efficiency of the operation of Rīga 2 thermal power plant has significantly increased due to the first round of its reconstruction. Ratio between electric and heat capacity in co-generation increased significantly, from 0.5 to 1.5, thus ensuring more efficient use of the heat load. The new energy block, also when working in condensation mode, can achieve a very high coefficient of efficiency, up to 57–58 %. In 2013, reconstruction of Rīga 2 thermal power plant ended with the reconstruction of the second block of the thermal power plant. The new block of Rīga 2 thermal power plant can generate up to three times more electricity per one heat unit than previously the old energy blocks.

In addition, in 2013 FORTUM cogeneration plants commenced operation in Jelgava, ensuring generation of thermal energy and electricity, thus saving the consumption of primary energy resources.

Efficiency of electricity transmission is characterised by losses in the electricity transmission system of *Augstsprieguma tīkls AS* which were 2.4 % of the total quantity of electricity transmitted in 2013. Taking into account that the amount of losses in the electricity transmission system is significantly affected by the climatic conditions and the reduction in the amount of losses to be achieved with technical solutions (change of equipment, etc.) requires substantial financial investments, *Augstsprieguma tīkls AS* has provided for economically and technically feasible measures for reduction of losses in the electricity transmission system in its 10-year development plan.

The level of losses in the electricity distribution was 4.95% of the amount of electricity transmitted in the electricity distribution system of *Sadales tīkls AS* in 2013. The level of losses has been reduced by more than three times since the middle of the 90ies. The majority of losses, 3.46 % of the quantity of electricity transmitted, is formed by technical losses of electricity in electrical lines and transformers, including 2.43 % in medium/low voltage transformers and 0.50 % in low voltage networks. The remaining part of losses is formed by non-technical losses of electricity – the error resulting from commercial recording and settlement of accounts, unpaid consumption of electricity, and also illegal use of electricity.

Energy efficiency in distribution and transmission of natural gas⁴⁴

Significant resources have been invested in the development and efficiency of the natural gas supply system, ensuring its safe and stable operation. Efficiency indicators of operation of the natural gas supply system established in Latvia are one of the highest in the EU. Technical losses in the system amount to approximately 1 % of the total quantity of natural gas sold in Latvia. Efficiency of the operation of the system and low value of losses of natural gas are ensured by:

- the application of highly sensitive gas indicators for detecting leaks;

- the establishment of new connections to gas pipelines operated and in repair work, using special technologies which prevent discharge of natural gas into the atmosphere, for example, T. D. Williamson and Raveti equipment for plugging gas pipelines;
- the installation of telemetry and telematics in the system, installing equipment for distance closing of the system.

Energy efficiency in centralised heating supply

Heating supply is a significant component of the energy sector in the climatic conditions of Latvia. Majority of the total energy consumption is generated in decentralised (local and individual) heating supply systems. In 2013, 44.6 % of the total final energy consumption was consumed in decentralised heating supply systems. At the same time, centralised heating supply is a very efficient solution from the point of view of using resources and environmental protection. Centralised heating supply is the most energy efficient type of heating supply which is widely used for the heating of both public buildings and multiapartment residential buildings. Significant part of heating fuel for centralised heating supply must be imported – in 2013 73.2 % of thermal energy in centralised heating supply was generated from imported fossil fuel, mainly natural gas.

7291 GWh (26.25 PJ) of thermal energy was generated in centralised heating supply systems in Latvia in 2013. The main customers of centralised heating supply are households – they consumed 71 % of the thermal energy supplied in centralised manner in 2013. Thermal energy in centralised heating supply systems is generated in cogeneration plants (69.1 % of thermal energy generated in centralised heating supply in 2013) and in boiler houses (30.89 % of thermal energy generated in centralised heating supply).

The majority of centralised heating supply systems have been constructed more than 25 years ago, they have become outdated and operate with large losses. The total length of heat networks in Latvia is approximately 2000 km. In many cases, technologies that have low energy efficiency and are non-environmentally friendly are used for the generation of thermal energy, and renewable energy sources are underused. Energy efficiency measures implemented within the last years have allowed to reduce the thermal energy losses in networks.

According to the data of the CSB, thermal energy losses in transmission and distribution network in 2015 in Latvia were 13 %, including in Riga region – 11.3 %, in Pierīga region – 14.1 %, in Vidzeme region – 14.8 %, Kurzeme region – 13.1 %, Zemgale region – 13.2 %, and Latgale region – 19.4 %. Heat losses of the cities in 2014 were 9 % and in towns – 16 %. There are still individual populated areas where heat losses reach 35–38 %.

Increasing of energy efficiency in centralised heating supply is hindered by the missing amount of investments, the limited ability of local governments to take a credit, as well as the slow speed of capital turnover. Due to these reasons local governments keep operating inefficient facilities which increases the consumption of heating fuel and are not able to provide heating supply in the necessary quality. The energy generation process can be optimised and losses of thermal energy in transmission systems can be reduced by carrying out complex restoration of the system.

The improvement of energy efficiency of the centralised heating supply systems requires to increase the efficiency of thermal energy generation, to reduce thermal energy losses in transmission and distribution systems, as well as to concurrently facilitate the replacement of the types of fossil fuel with renewable fuels. In the 2014–2020 planning period of the EU funds, the operational programme “Growth and Employment” provides for financing of the Measure 4.3.1 “To promote energy efficiency and the use of local RES in centralised heating supply”. Implementation of these energy efficiency measures will ensure reduction of GHG emission by at least 30,454 tCO₂ per year.

Aid to efficiency measures of centralised heating supply systems, as well as to the development of cogeneration plants was implemented during the 2007–2013 planning period of the EU funds. With the aid of the EU funds in the aggregate of centralised heating supply, as a result of implementation of the projects, it is planned to install 302.51 MW of heating capacity

and to reconstruct 149.72 km of heating mains, but the programme for the construction of cogeneration plants using renewable energy sources has ended, and the total heat capacity installed is 105.89 MW_{th}, whereas electric capacity – 36.55 MW_{el}.

Energy efficiency in final consumption

The largest energy consumption sectors in Latvia are households, transport, industry, and services. Consumers with the highest energy efficiency potential in Latvia are public, private and merchant buildings, as well as industry.

60–70 % of the building sector of Latvia can be renovated in a cost-efficient way – these are approximately 25 thousand multiapartment buildings with the total area of 38 mill. m² in the sector of residential buildings. The majority of dwellings have been built before the thermodynamic requirements for building envelopes were significantly increased, thus, they have a low level of energy efficiency. Investments for improving the energy efficiency of the dwelling sector are essential for the promotion of resource efficiency and total welfare. The heating and cooling supply systems of modern buildings are based on elements of the third generation centralised heating supply system which, in long-term, will be replaced with fourth generation systems. It is related to the development of heating supply systems of lower potential and in perspective – with low-temperature heating supply in which renewable energy sources are integrated.

In relation to energy efficiency measures for multiapartment and social residential buildings that received aid in the 2007–2013 planning period, information regarding aid measures and amounts is presented in Annex 4.

Statistical summaries on energy efficiency of buildings are regularly published on the website⁴⁵ of the Ministry of Economics. Ex-ante Evaluation of Availability of Finances for Increasing Energy Efficiency of Multiapartment Buildings for the 2014–2020 Planning Period of European Union Funds has been carried out, including an evaluation of the efficiency of introduction of Activity 3.4.4.1, Measures for the Improvement of Thermal Insulation of Multiapartment Buildings, of the 2007–2013 planning period of the EU funds and public financing per one square metre of the building⁴⁶.

Energy efficiency of buildings of the public sector is important not only due to the saving of resources and environmental considerations. Renovation of State and local government buildings ensures the leading role of the public sector in showing an example and promotes energy certification of buildings in accordance with the requirements of the EU directives. Renovation of State buildings is provided for within the framework of Measure “4.2.1.2. To promote improvement of energy efficiency in State buildings” of the 2014–2020 planning period of the EU funds. Primarily the objective of the abovementioned measure is to fulfil the requirement of Directive 2012/27/EU in the time period from 2014 to 2020 – to renovate 3 % of the area of buildings of State direct administration, taking into account the flexibility possibilities provided for by Directive 2012/27/EU for the breaking down of the achievement of the target by years. The list of the buildings subject to this objective is published on the website of the Ministry of Economics and notified to the European Commission⁴⁷.

Production buildings relate to the industry and construction sector which is the third largest final consumer of energy in Latvia. Further rise in prices of energy resources may affect industrial sectors of importance to economy because raw material costs affect both local and foreign producers equally, however, the costs of energy differ depending on the country. Therefore, it is important to promote efficient use of energy resources and to reduce consumption of energy, particularly in the field of manufacturing industry.

The operational programme “Growth and Development” of the 2014–2020 planning period of the EU funds provides for financing of the following measures for the improvement of energy efficiency of buildings:

- 4.1.1. “To promote efficient use of energy resources, reduction of energy consumption, and transition to RES in the sector of manufacturing industry”
- 4.2.1.1. “To promote increasing of energy efficiency in residential buildings”;

- 4.2.1.2. “To promote increasing of energy efficiency in State buildings”;
- 4.2.2. “According to the integrated development programmes of the local government to promote increasing of energy efficiency and use of RES in local government buildings”;

These measures will contribute to achievement of the target of the mandatory energy savings of the State, and the savings to be achieved will be specified therein as the criterion for granting financing for the determination of which the indicator of energy consumption in MWh per year prior and after implementation of the project will be notified. In other activities of the 2014–2020 planning period of the EU funds in which investments in buildings, equipment, and vehicles will be supported, the abovementioned indicator of energy consumption will be notified according to the methodological recommendations developed by the Ministry of Economics⁴⁸.

Implementation of these energy efficiency measures will ensure reduction of GHG emission by at least 32.256 tCO₂ per year.

Article 7 of the Energy Efficiency Directive 2012/27/EU lays down an obligation for the EU Member States to create an energy efficiency obligation scheme with the objective for the energy distributors and/or retail energy sales companies which have been determined as obligated parties in the obligation scheme to contribute to the achievement of the savings target of the final consumption until 31 December 2020. The abovementioned target is at least equivalent to the target to achieve new savings each year from 1 January 2014 to 31 December 2020 in the amount of 1.5 % of the annual energy sales to final customers of all energy distributors or all retail energy sales companies. The abovementioned State mandatory cumulative target of energy savings in the amount of 9897 GWh according to the conceptual decision⁴⁹ taken by the Cabinet will be achieved by implementing measures of energy efficiency policy introduced by the State and involving energy supply companies in the energy efficiency obligation scheme. The measures for the improvement of energy efficiency provided for in the Energy Efficiency Directive 2012/27/EU, including those implemented by the State, will be used for the achievement of the final energy savings target as much as possible, providing for the establishment of different mechanisms promoting energy efficiency, ensuring that at least 60 % of the target are fulfilled with them. In turn, the energy efficiency obligation scheme will be formed as an additional element within the framework of the joint energy efficiency policy depending on the progress achieved in the fulfilment of the target, ensuring that it forms the smallest part of the total savings to be achieved until 31 December 2020 and that its main target audience is final consumers of energy which themselves might have difficulties in settling on energy efficiency measures and which are not encompassed in measures for the improvement of energy efficiency implemented by the State.

Electricity supply systems deal with many innovative solutions in order to ensure efficient supply of electricity and reduction of consumption for final consumers. By 2020 Member States, including Latvia, must install smart measuring systems in households in order to ensure the monitoring possibilities for consumers. Deployment of an energy monitoring system not only has a significant impact on changes in the behaviour of consumers, but also facilitates reduction in consumption of electricity by households. In order to achieve this result it is necessary to ensure the participation of all parties involved (energy producers, system operators, traders, and consumers of energy) in the operation of the smart system, as well as to provide inhabitants with qualitative information regarding smart systems and technologies. Information has a significant role in inhabitants' understanding of environmental and energy efficiency issues.

Indicator of energy consumption efficiency – energy intensity

Interaction between the economy and energy is characterised by a range of indicators, however, intensity of primary energy, final energy or electricity showing the energy intensity of the State economy is used most extensively (see Table 6). Energy intensity is measured in

energy consumption per unit of gross domestic product, expressed in monetary units in constant prices (for example, GJ per GDP unit euros in prices of 2020 (GJ/euro (2000))). Changes in the intensity of primary energy reflect trends in the total productivity of energy use in the State.

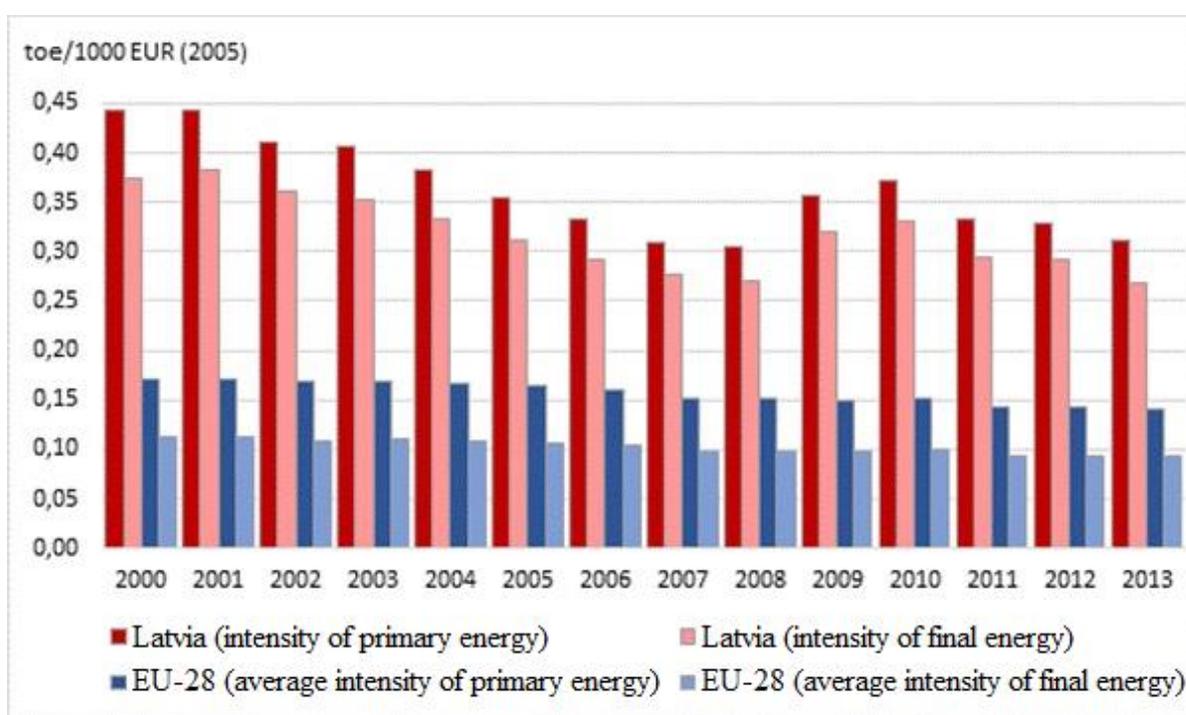
Table 6.

Intensity of primary energy and final energy (toe/1000 euros (2005))

	2008	2009	2010	2011	2012	2013
EU-28 (average intensity of primary energy)	0.151	0.149	0.151	0.144	0.143	0.142
Latvia (intensity of primary energy)	0.306	0.357	0.371	0.334	0.329	0.311
Intensity of final energy (toe/1000 euros (2005))						
EU-28 (average intensity of final energy)	0.098	0.097	0.100	0.094	0.094	0.094
Latvia (intensity of final energy)	0.271	0.320	0.331	0.295	0.292	0.268

Source: Eurostat

In the time period from 2000 to 2013 intensity of primary energy in Latvia has decreased by approximately 30 %. This can be explained by both increasingly efficient use of energy resources and structural changes in economy, as well as by the overall economic growth. Reduction in intensity of primary energy can also be explained by investments in the energy transformation sector for the replacement of equipment and reduction of losses in energy transmission and distribution networks. However, energy intensity in Latvia is more than twice as high than on average in the EU (see Figure 33).



Source: Eurostat

Figure 33. Intensity of primary energy and final energy in EU-28 and Latvia

Increasing of energy efficiency in the industrial sector is closely related to implementation of the sustainable development strategy and determining of balance between economic growth and cleaner generation. In order to overcome different obstacles (economic,

organisational, behavioural, competence, awareness, and other) and to facilitate increasing of energy efficiency in the industrial sector, it is necessary to deploy an energy management system or to perform energy audits on a regular basis, introducing the found measures therein. Systematic management of energy consumption helps undertakings to establish organised systems of production processes in order to ensure efficient control of the operation of the undertaking and to reduce energy consumption in the undertaking. Performance of regular and qualitative monitoring is an essential aspect in producing undertakings which promotes increasing of energy efficiency.

The high energy intensity is affected by the industry structure of Latvia where wood processing sector has a significant role in which production takes place with comparatively low energy efficiency due to the technologies used (heat gained from incinerating wood remainders is used in the process of drying wood).

One of the action directions of the NDP2020 is “Energy efficiency and energy generation” with the objective to ensure sustainable use of the energy resources necessary to national economy, including facilitating the reduction in energy intensity from the equivalent of 372.9 kg of oil per 1000 euros from GDP in 2010 to the equivalent of 280 kg of oil per 1000 euros from GDP in comparable prices of 2000 in 2020. According to the data of Eurostat, energy intensity in 2013 was the equivalent of 321 kg of oil per 1000 euros which exceeds the planned trajectory of achieving the target. Reduction in energy intensity was ensured by the energy efficiency measures implemented in both the energy transformation sector and the final energy consumption sectors.

These measures ensure that Latvia is moving towards the target specified in the National Reform Programme to achieve energy savings in the amount of 0.67 Mtoe in 2020. During the last years gross domestic energy consumption has decreased by 0.16 Mtoe (from 4.6 Mtoe in 2008 to 4.31 Mtoe in 2013).

Support policy which includes access to information regarding technological solutions and energy efficiency and industrial energy audit has an important role in increasing energy efficiency in the industrial sector of Latvia.

3.7. Management of Crisis Situations

Generally the structure for the provision of energy supply in Latvia may be considered balanced and sufficiently diversified. Since construction of Klaipēda liquefied natural gas terminal and improvement of Klaipēda–Kiemēnai transmission infrastructure alternative natural gas supply routes and sources of origin are also available.

The structure of consumption of primary energy resources of Latvia consists of three main components – oil products, fuelwood and charcoal, and natural gas. In 2014, local energy resources ensured 34.9 % of the total consumption of primary energy resources. Majority of them was renewable energy sources (RES) – wood biomass, hydro-resources, wind, biogas, biofuels, and local energy resources – peat, waste. The remaining part or 65.1 % of energy resources among which oil products and natural gas are the most important were imported from different countries of the Baltic region, EU, and the third countries, including from Russia. In 2014, natural gas was supplied only from Russia.

The previously commenced processes and the measures implemented by State authorities must be continued in Latvia in the field of energy supply safety to reduce the dependence of the State from external supplies of resources and to diversify the routes and sources of supplying energy resources, to strengthen safety of the energy supply networks and systems which conforms to the basic directions specified in the long-term energy strategy of Latvia for 2030.

The situation of an energy crisis in Latvia is governed by the Cabinet Regulation No. 312 of 19 April 2011, Procedures for the Supply of Energy Users and Sale of Heating Fuel During Declared Energy Crisis and in Case of Endangerment to the State. This Regulation lays

down the procedures by which consumers of energy shall be supplied with energy during a declared State or local energy crisis, and the procedures by which the energy supply merchants, merchants ensuring and providing the security reserves service and merchants to which licences have been issued in accordance with the procedures laid down in laws and regulations for the performance of entrepreneurial activities related to fuel shall sell heating fuel owned by them upon a request from the State or local government energy crisis centre.

In order to ensure further development of the electricity sector and market, availability of the structure and its transmission capacities have a crucial role. The energy infrastructure projects of the most significance to Latvia and the Baltic region are defined in the Baltic Energy Market Interconnection Plan (hereinafter – the BEMIP).

Electricity supply

According to the information provided by the operator of the electricity transmission system in 2014 self-provision with capacity is 88 % (at maximum load). In 2014, 68.9 % of the total gross electricity consumption were generated in Latvian power plants and approximately one third of the total gross electricity consumption of Latvia was formed by electricity net import (31.1 % in 2014).

In order to promote energy independence, to ensure the physical flow of electricity between the Baltic States and the Nordic States, and the flow capacity of interconnections, it is important for Latvia to implement two electricity infrastructure development projects within the scope of the Connecting Europe Facility (CEF) – “Third Stage of *Kurzemes loks* ” which provides for the construction of 330 kV overhead high-voltage electric lines in the western part of Latvia in order to prevent the possibility of increased capacity connections which have been lacking hitherto, to ensure the development of wind parks, and to increase safety of electricity supply in Kurzeme, and establishment of a third interconnection of Estonia–Latvia which provides for the connection of substations of the second power station of Riga and Kilingi–Nõmme in Estonia, as well as for the construction of a connection between Harku and Sindi.

These interconnections are essential projects of the future infrastructure for the whole Baltic region which will improve safety of energy supply in the region and will help to create a single, uniform electricity market of the Baltic States and the Nordic countries, and will ensure possibilities for Lithuania and Latvia to procure electricity in a larger amount from the countries of the North Europe which are rich in hydro-resources, reducing the retail price of electricity in the district.

The power plants of Latvia and neighbouring countries operating in the base mode are important for State power supply. Majority of the consumed electricity is generated in own power plants – Rīga 1 and 2 thermal power plants, and the cascade of hydroelectric power plants on River Daugava. The first power plant of Riga and the second power plant of Riga have been completely reconstructed. The operating mode of the cascade of hydroelectric power plants on River Daugava (the largest source of generation) directly depends on the influx of water in River Daugava.

In order to ensure the supply of electricity to objects of consumers which are more than one million in Latvia, the provision of qualitative distribution system services has a significant role. The functions of the distribution system operator in Latvia are carried out by eleven undertakings of which *Sadales tīkls AS* that belongs to *Latvenergo AS* Group is the largest one. It provides the supply of electricity to more than 99 % of the State consumers of electricity and connection of new consumers of electricity to the electricity network, as well supervises the use of electricity, meters the electricity consumption, and implements measures for the reduction of losses in the distribution network.

In 2014, disruptions of electricity supply in the electricity network of overhead lines were recorded 29 712 times which is by 14 % less than in 2013. The largest proportion of the number of disruptions was formed by disruptions in the overhead lines, particularly in the low-

voltage electricity network. In 2014, 43 % of the total number of disruptions occurred as a result of adverse weather conditions. In 63 % of cases, technological disturbances in the cable electricity network were caused by ageing of the materials used in the construction of cable lines. Damages to the electricity network caused by the third parties have a large impact on the quality of electricity supply. In 2014, damages caused by the third parties were recorded 678 times which is by 182 cases or 37% more than in 2013.

Generators of renewable electricity producers are being increasingly connected to the distribution networks. As their share increases, the impact on normal operation of the network, safety of electricity supply to customers, and quality of voltage increases. Therefore, changes must also be made to the technical and technological equipment of the network to ensure harmonious, safe, and qualitative operation of the distribution system in the future.

Taking into account the experience obtained during elimination of the damages caused by the snowbreak in winter of 2010/2011, the *Latvenergo AS* has developed a set of its measures to reduce the impact of mass damages on the frequency and duration of disruptions in the electricity supply to customers. The set of measures includes:

1) a plan of measures for the improvement of actions of the capital companies belonging to *Latvenergo AS* group of companies in operational control, coordination of emergency situations, and communication in emergency situations;

2) a plan of measures for the improvement of the maintenance and technical development of electricity distribution networks which would mitigate the risk of disruptions in electricity supply in long-term;

3) a plan of measures for amendments to laws and regulations which are necessary for mitigating the risk of disruptions in electricity supply and facilitating the elimination of the consequences of emergency situations;

4) a plan of measures for the procurement/ensuring of the units of special machinery for the elimination of the consequences of emergency situations.

Supply of natural gas

The share of natural gas in consumption of total primary energy resources in 2014 was 24.4 %. In Latvia, natural gas is mainly used in generation of electricity and thermal energy. Natural gas supplies are stable as attested by the permanent monitoring of Inčukalns gas storage facility performed by the Ministry of Economics. However, unlike State supply with electricity and oil products supply of natural gas is less diversified. In Latvia, natural gas is supplied by one vertically integrated undertaking *Latvijas Gāze AS* in which 47.32 % of stocks belong to *E. ON Ruhrgas International GmbH*, 34 % – *Gazprom OAO*, 16 % – *ITERA Latvija SIA*, and 2.77 % – other stockholders. In February of 2009, *Latvijas Gāze AS* signed new natural gas supply contracts with *Gazprom AAS* and *Itera Latvija SIA*. These new contracts ensure supply of natural gas to *Latvijas Gāze AS* until 2030.

Concurrently with accepting into operation of Klaipėda liquefied natural gas terminal of Lithuania at the beginning of 2015, the gas market of Latvia and actually also the whole Baltics is not isolated anymore and is not completely dependent on one supplying country – Russia, thus the safety risks have been reduced.

At the same time, Latvia is not directly connected to other EU states. In order to continue diversification of the supply routes and sources of natural gas and establishment of the natural gas market, the BEMIP lays down the necessary aggregate of infrastructure projects providing for the construction of gas interconnections of Poland–Lithuania, as well as the improvement of the interconnection of Latvia–Lithuania and Latvia–Estonia, and the modernisation and expansion of Inčukalns underground natural gas storage facility which will increase the safety and stability of natural gas supply in the region.

In order to decrease the impact of the potential crisis situation, a risk assessment is being carried out. It may be assessed at three levels:

- at local scale (disruption in separate part of one country);
- at national scale (disruption in one of the Baltic States);
- at regional scale (disruption or restrictions in all countries).

Continuous operation of the natural gas infrastructure must be ensured at all levels, but primarily at regional level. If critical disturbances arise in one largest element of the gas supply infrastructure, they are characterised by the safety indicator (criterion) N-1 of the infrastructure. If this criterion in the region is equivalent to at least 100 %, then if disturbances arise in this element, supplies of natural gas may be organised in a way that no restrictions on the supply of natural gas form. The criterion N-1 is 145.94 % in the Baltic States, provided that gas is available at Inčukalns UGSF. When calculating the criterion N-1, only capacities of input points of the natural gas supply system are taken into account.

Therefore, when the political situation aggravated in 2014, the EU started paying more attention to the energy safety. In summer 2014, upon initiative of the European Commission, all EU Member States participated in a measure of evaluation of short-term energy supply risks. The objective of the task was to determine the ability of the mutually connected energy system of Europe to withstand continuous disturbances in gas supply (in duration of one to seven months) during winter. The conclusions drawn as a result of the measure have outlined a potentially more efficient way of using synergies among the EU Member States at European and regional levels and to identify specific solutions which are necessary to improve the flexibility of the system and to prepare an emergency action plan at regional level.

Strengthening the safety of gas supply requires to ensure timely opening of the natural gas market of Latvia and separation of trade in natural gas from its storage and transmission, to facilitate joint implementation of projects by ensuring efficient and safe operation of the regional gas market, to review and improve the Preventive Action Plan and the Emergency Action Plan, including at regional level, to ensure the possibility of using the potential of Klaipėda LNG terminal in Latvia, to promote the creation and development of the dialogue at the EU level with gas suppliers outside Europe, to continue maintaining of reserve heating fuel in heating supply undertakings, as well as to evaluate the possibilities to implement a gradual transition to biomass in heating supply undertakings and to implement the activities provided in the BEMIP in the field of electricity.

Supply with oil products

The situation in State supply with oil products may be characterised as safe and stable. Taking into account that Latvia imports oil products, economic and political risks have a large impact on the supply safety, but the impact of these risks may mainly manifest when the operation of the oil market of the Western Europe is hindered as a result thereof.

Supply channels of oil products to Latvia are sufficiently diversified as the oil products are supplied from both Eastern and Western markets. International and local retail oil companies which may carry out procurements of oil and oil products in different regions of the country are operating in Latvia. Oil products may be supplied both using railway and maritime transport.

Bringing in of motor gasoline and diesel fuel for retail and wholesale in Latvia is possible from at least 10 oil processing undertakings within the radius of 1000–1500 km. The oil product pipeline from Samara in Russia and Novopolotsk in Belarus allows transportation of diesel fuel with the possibility of supplying it in Ilūkste and Ventspils.

Safety reserves of oil products are created in Latvia as in other EU Member States (see Table 7). Council Directive 2009/119/EC of 14 September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or oil products (hereinafter – Directive 2009/119/EC) lays down that a Member State in the territory of the European Union must ensure the total oil stocks corresponding to 90 days of average daily net imports or 61 days of average daily inland consumption, whichever of the two quantities is greater. On the basis

of that laid down in the Energy Law, the Ministry of Economics fulfils functions of the Central Structure for the Maintenance of Reserves, including procures and administers the service of safety reserves of oil products, administers the State fee for the maintenance of safety reserves, and each year by 1 June announces an open tender for the provision of services of safety reserves.

Table 7.

Amount of safety reserves of oil products, sums of the service and average price per tonne

Years	Amount / tonnes	Price of the service excluding VAT/EUR	Average price per tonne /EUR
2011–2012	247 767	19 879 624	6.69
2012–2013	230 820	21 657 702	7.82
2013–2014	315 990	28 751 921	7.58
2014–2015	327 644	18 595 585	4.73
2015–2016	328 374	12 580 882	3.19

Not less than 25 % of the total amount of safety reserves to be stored are stored in the territory of the Republic of Latvia and not more than 75 % of the total amount of safety reserves to be stored may be stored in other European Union Member States.

For example, State safety reserves of oil products for 2015/2016 were stored in the territory of the Republic of Latvia (61.32 %), in the territory of the Republic of Lithuania (11.27 %), in the territory of the Kingdom of Belgium (12.18 %), and in the territory of the Kingdom of the Netherlands (15.23 %).

In order to ensure stable and safe supply with oil products, it is necessary to continue the maintaining of the State safety reserves of oil products in specific amount, as well as to strengthen cooperation with the competent authorities of the EU Member States so that in case of a crisis mutual supply with stocks of oil products could be expedited.

For the provision of operative services of Latvia with fuel reserves in situations of endangerment, Cabinet Regulation No. 673 of 1 December 2015, Regulations Regarding the Provision of the National Armed Forces, the State Fire and Rescue Service, the State Police, the State Border Guard, the Emergency Medical Assistance Service and the Civil Protection Bodies to Be Mobilised with Fuel in Case of Endangerment to the State, has been drawn up laying down the procedures for ensuring the National Armed Forces, the State Fire and Rescue Service, the State Police, the State Border Guard, the Emergency Medical Assistance Service, and the civil protection bodies with fuel in case of endangerment to the State.

3.8. Innovative Solutions in the Energy Sector

Future of the energy sector cannot be imagined without innovative solutions. Use of hydrogen is one of examples.

Hydrogen technologies are a long-term energy solution which may be used in all sectors of economy and which ensures an extensive range of benefits in relation to energy safety, transport, environment, and efficiency of resources in order to achieve the target – to reduce GHG emissions – by 2050. Hydrogen is considered to be a perspective element in the field of energy resources due to its multifunctional properties – it is both energy carrier and fuel, and a raw material necessary in many sectors of national economy. Hydrogen may be acquired using both renewable and fossil energy resources. Hydrogen chemically incinerated in elements of heating fuel, as a result of reaction, transforms back into water. As water is available in large

quantities on the surface of the Earth and the cycle of hydrogen – oxygen is reversible, such acquisition of energy is also sustainable.

Hydrogen, depending on technology, can be used for the acquisition of electricity and heat, as well as it may be stored in order to use it when a demand for energy occurs. Depending on the demand for the necessary capacity and the availability of the infrastructure, there are different technologies for the transformation of hydrogen into energy. In Europe and elsewhere in the world, hydrogen is already being used for the acquisition of energy and active scientific work on the research of hydrogen is taking place also in Latvia. The main issues to be solved are – how to acquire hydrogen for a sufficiently low price and how to deliver it to the consumer. Micro-organisms producing hydrogen are considered as one of the solutions – bacteria may form bio-hydrogen through photosynthesis or fermentation process.

Concurrently, there are obstacles for the use of hydrogen as the source of energy:

- large losses of hydrogen in the generation cycle;
- complicated process of acquiring hydrogen in comparison to hydrocarbon resources;
- large investments in acquisition and use of hydrogen.

The use of hydrogen in Latvia could be an efficient solution as there is a large quantity of water resources in the country. For example, for consumers who need a new connection or increase in capacity and who are located in regions with low density of consumers and for the provision of electricity supply of which construction or reconstruction of long electric lines is necessary, autonomous electricity supply may be offered as a cheaper alternative, using progressive, environmentally friendly technologies (hydrogen generators, fuel cells, solar cells, wind generators, or also combinations of several abovementioned technologies) with appropriate intelligent control of consumption and possibilities of energy accumulation. There are possibilities of producing power-to-gas and e-fuel which are obtained in water electrolysis with electricity generated by sun and wind.

One of the largest potentials is the use of hydrogen in transport – a specific segment is passenger cars and traffic buses. For example, local government of Riga has joined the European Association for Hydrogen and Electro-mobility (HyER) and is participating in several international projects which are related to the deployment of hydrogen transport, including in a project which provides for the deployment of public hydrogen refuelling stations in Riga. In addition, it participates in a project which provides for the cooperation of two vehicle companies – *Ballard* (Canada) and *Škoda* (Czech Republic) in order to create a substantially new vehicle – hybrid which is powered by electricity and hydrogen (elements of heating fuel) drive on the basis of modern trolleybuses and may service passengers not only within the limits of the infrastructure of trolleybuses, but also outside it in suburbs of the city and in the outskirts of the city.

Hydrogen may be combined with CO₂ gas, acquiring methane which may be used in natural gas networks or as liquid fuel in vehicles in direct way or together with the ordinary fuel. All raw materials which are necessary for the production of such fuel are available in Latvia.

In relation to innovative solutions in centralised heating supply, challenge for all EU Member States, including Latvia, will be the transition from the model of the third generation centralised heating supply to the model of the fourth generation centralised heating supply, characterised by:

1) open transmission networks to which any interested person can connect, also a private dwelling which generates energy for its consumption, using RES, and it may input the surplus of thermal energy into the network, but also take the lacking thermal energy therefrom if necessary;

2) a decreased schedule of temperature of the heat carrier in networks (up to 70/30 °C) which ensures very low heat losses (up to 2–3 %) in networks and increases the competitiveness of centralised heating supply, in comparison to the individual heating;

3) the networks provide the collection and accumulation of energy surplus in the form of thermal energy which is a new function of the centralised heating supply, moreover, daily accumulation and short-term accumulation containers, as well as seasonal accumulation is organised, for which large covered water basins, as well as underground accumulation basins are used;

4) targeted increase in the use of RES, decreasing the use of fossil heating fuel;

5) use of new types of energy in generation of thermal energy (hydrogen, geothermal energy, etc.);

6) significant reduction in consumption of energy for heating of buildings which, in the new construction, is ensured by the requirements of the construction standard for almost zero energy consumption in buildings, but in the existing construction – restoration of such buildings in accordance with the new requirements of standards.

This is the field in which discussions will be necessary in the time period until 2020 not only amongst the policy makers, but also amongst sectoral professionals in order to adjust to innovative solutions and to implement pilot projects for the development technologies.

The Ministry of Education and Science administers the programme “Energy-efficient and Low Carbon Solutions for Safe, Sustainable Energy Supply Reducing Climate Changeability (LATENERGI)” approved within the scope of the National Research Programmes (Cabinet Order No. 558 of 7 October 2014) in the sub-direction “Energy” of the priority science direction 1 “Environment, climate and energy (environment, ecosystems and biological diversity, acquisition of renewable resources, energy independence, technologies for increasing safety of electricity supply, development of low carbon generation, reduction of climate changes, and adjusting to climate changes)”. The researches carried out within the scope of the programme provide for a complex and integrated approach in studying the interaction between the energy sector of Latvia and the restricting environmental factors. Also such scientific institutions are involved in the performance of the research work as the University of Latvia, the Institute of Solid State Physics of the University of Latvia, and the Latvia University of Life Sciences and Technologies.

More extensive use of information and communication technologies (ICT) in energy and transport is foreseeable in the future, providing an opportunity to achieve higher indicators of energy efficiency. For example, installation of smart meters in electricity networks and heating supply, deploying the possibilities of distance reading and control of the data which allows to follow the energy consumption and to ensure control of energy consumption and systems.

By promoting sustainability of the energy sector and taking into account the trends for the development of the electricity market, it is important to plan the measures for the development of the energy infrastructure in order to improve the safety of energy supply of the energy system of Latvia (network/condition control, network control possibilities, regulation of voltage and frequency), to improve the TSO and DSO operation model for an energy system with high proportion of RES and dispersed generation (voltage and frequency control), and to develop technologies of smart networks which provide an opportunity for the consumers of electricity to participate in the process of taking the decisions on the time and volume of use of electricity available to them. It is also important to conduct research and development of energy resources and technologies for the generation of energy, taking into account the development of regional generation technologies.

3.9. Strengthening of International and Regional Cooperation

The Strategy was adopted in 2009 with the objective of strengthening the regional cooperation and promoting balanced development of the region. Denmark, Estonia, Latvia, Lithuania, Poland, Finland, Germany, and Sweden are participating in the programme. Also the

cooperation countries Norway, Belarus, and Russia may be invited to participate in the projects implemented within the framework of the Strategy.

The Ministry of Economics of the Republic of Latvia, in cooperation with the Energy Agency of Denmark, are coordinators of the field of the energy policy within the framework of the **European Union Strategy for the Baltic Sea Region** (hereinafter – the Strategy).

The Strategy includes 17 policy fields (PF) and 5 horizontal activities for projects of significance to the regional development. PF “Energy” is the only policy field of the Strategy for which Latvia is responsible. The objective of the PF “Energy” of the Strategy is to improve access to, efficiency and safety of energy markets.

The main objectives of the Strategy are to save the Baltic Sea, to unite the region, and to increase welfare. In June 2015, a new action plan for the Strategy 2015–2020 was adopted.

Latvia takes active part in addressing the challenges of the energy sector of the Baltic Sea Region within the framework of the **Baltic Energy Market Interconnection Plan (hereinafter – the BEMIP)**. On 17 June 2009, eight member states of the Baltic Sea Region – the High-level Working Group – signed a memorandum of understanding with the European Commissioner José Manuel Barroso on the BEMIP which is the result of nine years of work proposed by the Commission in order to consider specific measures with the objective of uniting Lithuania, Latvia, and Estonia in a better way with more extensive energy networks of the EU and to prevent energy isolation of the three Baltic States, and to strengthen energy safety in the Baltic Sea Region. The High-level Working Group of the BEMIP is formed by the representatives nominated by Denmark, Estonia, Latvia, Lithuania, Poland, Norway (status of observer), Finland, Germany, and Sweden. Activities of the High-level Working Group are based around three pillars:

- internal electricity market;
- electricity interconnections and generation of electricity;
- internal natural gas market and infrastructure.

Projects of the energy infrastructure of significance to the region are being developed within the framework of the BEMIP.

In autumn 2014, the European Commission presented a proposal to optimise the operation of two regional cooperation formats in the Baltic Sea Region, combining the Baltic Energy Market Interconnection Plan (BEMIP) and the Strategy PF “Energy” action plans, as well as improving the coordination of both cooperation formats accordingly. The same countries are involved in the BEMIP initiative as in the Strategy. On 8 June 2015, the ministers for energy signed a new memorandum of understanding, conforming the readiness of Member States to work jointly on the solving of the topical problems of the region in the field of energy.

The BEMIP and the updated action plan of the Strategy until 2020 marks the following action directions: electricity and gas market, safety of electricity supply, energy infrastructure, nuclear energy, renewable energy sources, energy efficiency. The action plan emphasises that it is necessary to terminate energy isolation, to increase safety of energy supply, to promote market integration, as well as to support energy efficiency and sustainable use of energy sources in order to promote the development and welfare of the region.

Since 2013, the High-level Energy Committee of the Baltic Council of Ministers (BCM), within the framework of which high-level officials of Latvia, Estonia, and Lithuania discuss and agree on the topical issues of the three Baltic States in the field of energy, is operating successfully. The format ensures an opportunity to find mutually advantageous solutions and to successfully defend joint interests in the EU. Organising and management of meetings is undertaken by the presiding country for a year. In 2016 and 2019, the presiding country of the BCM format is Latvia.

Description of other formats of international and regional cooperation is provided in Annex 1.

Latvia is interested in active participation in the implementation of measures of international and regional cooperation. By participating in cross-border activities, Latvia has

better opportunities to successfully defend its State interests in the development of joint solutions with other Member States of the region.

4. SWOT Analysis

4.1. Electricity

Strengths

- High self-provision of the energy system of Latvia with generating capacities.
- Reconstructed high power thermal power plants may work efficiently both in co-generation and condensation (Rīga 2 thermal power plant) mode. Relatively large, rapid reaction RES capacities in the HPP cascade on River Daugava.
- Approximately 40-60 % of the final State electricity consumption is generated in the HPP cascade on River Daugava with relatively low costs of generation of electricity.
- High share of installed capacities that operate in co-generation mode with high coefficient of efficiency.
- Generation of electricity in thermal power plant creates a small amount of CO₂ and NO_x emissions.
- Liberalised and comparatively liquid electricity market for consumers of electricity.
- Electricity transmission system of Latvia is connected to Estonia, Lithuania, and Russia via synchronised links. In turn, the electricity system of the Baltics via asynchronous links is connected to the transmission networks of Scandinavia.
- In trading districts of all three Baltic States the day-ahead market *Elspot* and the intraday market *Elbas* has been introduced, ensuring efficient operation of the wholesale market.
- Free choice of electricity market for all consumers.

Weaknesses

- At high prices of natural gas, the electricity generated in thermal power plant in condensation mode has a relatively high price.
- Generation of electricity from RES is characterised by seasonal output of electricity, as well as dependence on climate and hydrological circumstances (for example, the HPP cascade on River Daugava, small HPPs).
- State aid mechanisms cause increase in the total price of electricity (particularly the MP component) and, therefore, causes additional financial burden on consumers.
- Insufficient development of technologies for RES to be competitive on the free electricity market without subsidies.
- By constructing new cogeneration plants or boiler houses, the possibilities of selling cogeneration thermal energy and savings of primary energy resources are reduced in the operational zones of cogeneration plants and risks of rise in electricity prices are caused.
- Comparatively wide range of consumers of electricity with limited solvency.
- Complicated aid mechanisms for low income and poor consumers of electricity. If only one chosen trader of electricity can provide electricity for reduced price, then the possibilities for the supported groups of consumers to choose a trader are restricted.
- Insufficient interconnections with energy systems of the Nordic states, Central and Eastern Europe which is the reason for different market price of electricity.
- Due to administrative barriers obtaining of permits for the construction of electricity transmission lines is delayed (for example, approval of the environmental impact assessment, receipt of construction permits).

- Length of the lines of the distribution network compared to the consumption of electricity has been one of the largest in the EU which causes comparatively large costs of the specific maintenance of the distribution network per one consumer.
- Technical execution of medium voltage electric lines (bare wires), taking into account the environment of their location (forests, overgrown meadows).
- Existing structure of tariffs for private individuals which is based only on consumption of electricity is not motivating for reducing the quantity of unused electricity network.

Possibilities

- Efficient use of alternative and renewable energy sources.
- Use of capacities of Riga TEC and Rīga HPP on River Daugava for the provision of regulation balancing, reserving of the energy system and other services of the transmission system.
 - Increasing of efficiency and operational safety of hydro-aggregates of Rīga HPP on River Daugava by carrying out reconstructions.
 - At low price of natural gas the competitiveness of Rīga thermal power plant on the electricity market increases, particularly in co-generation mode.
 - Improvement of State aid for RES and generation of electricity in co-generation, transitioning to market-based mechanisms.
 - Deployment of smart technologies in energy supply networks.
 - Reduction of the impact of natural disasters, rebuilding of individual electric lines from overhead to cable lines.
 - Increasing of savings of primary energy resources, increasing the energy output in co-generation.
 - Implementation of competitive projects for generating capacities of the Baltic scale.
 - Ensuring of a Latvia/Lithuania price district with sufficiently cheap electricity from the Scandinavian countries.
 - More extensive electrification of railway and public transport.
 - Development of the infrastructure for charging of electrical vehicles, balancing it with the electric capacities available from the largest distribution system operators and the capacity of the electric network.
 - Autonomous electricity supply – use of alternative, environmentally friendly technologies which would allow to reduce the total length of the network and the maintenance costs in distant rural regions where there are very few consumers.

Threats

- Increase in the price or disruptions in the supply of natural gas.
- Supply of electricity in the BRELL arc is hindered.
- Reduction in operational safety of the energy system due to construction of high-capacity generating blocks in the neighbouring countries and their operation in the IPS/UPS system or in the synchronization mode of the Baltic States with the continental Europe.
 - Natural hazards and disasters may affect the safety of electricity supply, particularly in regions with large areas of forests.

4.2. Natural gas

Strengths

- High safety level of natural gas with the reserve of the natural gas infrastructure of 45 %.

- Technically optimal infrastructure for high-pressure transmission of natural gas in Latvia, particularly in economically more active territories.
- Good technical condition of natural gas transmission and distribution gas pipelines, modernised and reconstructed natural gas measuring stations.
- Supply of natural gas in the winter period is ensured by Inčukalns UGSF which also serves as the safety guarantee throughout the year.
- Modernised Inčukalns UGSF (duplicating infrastructure for binding the gas mains of Inčukalns UGSF, compressor shop).
- Environment-friendly source of energy with low level of CO₂ emissions and efficient heating fuel with high calorific value.

Weaknesses

- Lack of interconnections with other EU Member States (via the natural gas transmission system of Lithuania or Estonia).
- Insufficient capacity of the Latvia–Lithuania interconnection.
- Upon development of supply routes of natural gas in Estonia and Finland, there will be a lack of reverse natural gas flows from Estonia to Latvia.

Possibilities

- To ensure third parties transparent access to the natural gas distribution, transmission systems and the system of natural gas storage facility.
- Diversification of supply routes of natural gas, constructing new connections of the transmission system (gas interconnection of Poland–Lithuania, gas interconnection of Finland–Estonia *Balticconnector*), and construction of a competitive LNG terminal.
- Supply of natural gas from Klaipėda LNG terminal.
- Establishment of the Baltic natural gas trading platform/hub with participation of Latvia.
- Reduction in price of natural gas which allows to increase the use of natural gas for both the output of electricity and heat; moreover, upon increase in consumption of natural gas, the costs of using the natural gas infrastructure decrease for consumers of natural gas.
- If the consumption of natural gas in the region increases in long-term, the development of other potential places for the storage of natural gas (for example, in Dobele) where natural gas can be stored for markets of other EU Member States.
- Increasing of the potential for the storage of natural gas at Inčukalns UGSF.
- Using of the transboundary storage potential.
- Development of generation of biogas, gas produced from wood biomass (syngas) and power-to-gas (e-methane), and deployment in the natural gas distribution system.
- Extensive possibility to use natural gas both in generation installations and heating supply installations, particularly in high energy efficiency cogeneration installations, producing concurrently thermal energy and electricity.
- Use of natural gas in the transport sector, if the gas filling infrastructure is provided.

Threats

- Increase in the price of natural gas in the global market.
- Drop in consumption of natural gas may increase the costs of using the natural gas infrastructure for consumers of natural gas.
- Disruptions in supply during the period of pumping into Inčukalns UGSF.
- Insufficiency of gas supply during high consumption period (during winter season) as a result of accidents at natural gas systems of the Baltic.

- Control over the natural gas supply and storage infrastructure of strategic importance is acquired by companies of the third countries and used against the public interests of Latvia.
- Upon increasing the consumption of natural gas, energy independence of Latvia decreases.

4.3. Heating Supply

Strengths

- The centralised heating supply has a large share of high efficiency cogeneration.
- Diversification and reservation of heating fuel is ensured in the largest centralised heating supply systems.
- Use of RES is ensured in several centralised heating supply systems in large amounts.
- Large share of RES in decentralised heating supply, mainly in the sector of private dwellings.
- The largest heating supply undertakings have modernised heat sources and the heating supply infrastructure according to the present-day requirements.
- Centralised heating supply systems are ensured with sufficient reserve capacities.
- Sufficiently strict control of CO₂ and other harmful emissions in centralised heating supply systems.

Weaknesses

- The existing normative regulation in the field of heating supply does not conform to the actual situation in the sector.
- Cross-subsidies for the generation of heat and electricity in co-generation.
- Separate heat supply systems operate outdated thermal energy generation installations with low efficiency of the use of energy resources as a result of which the thermal energy tariff is increased.
- In separate places the heating supply infrastructure has become outdated as a result of which there are large losses of thermal energy in heating mains (loss of thermal energy in transmission and distribution networks in Latvia in 2012 was on average 14 %). Low efficiency of the use of heating fuel in decentralised heating supply.
- Reconstruction of heating systems and heating sources carried out hitherto has been mainly done counting on the high demand of the existing non-efficient consumers (particularly multiapartment buildings) for thermal energy, i.e., hitherto improvements of the heating sources and systems of centralised heating supply took place comparatively quicker than increase in energy efficiency of the consumers of thermal energy.
- Non-conformity of centralised heating supply capacities with the load demanded by consumers in cases when reconstruction of centralised heating supply systems and measures of energy efficiency of buildings have not been coordinated amongst them.
- Low involvement of final consumers in measures for increasing energy efficiency. Comparatively high fixed costs of the centralised heating supply system the proportion of which in the thermal energy tariff increase if energy efficiency at the end of the final consumer is increased.
- Potential increase in the thermal energy tariff in individual local governments upon expiration of aid to high efficiency cogeneration plants within the framework of the mandatory procurement.
- Low solvency of consumers and large debts of inhabitants for thermal energy cause an insolvency risk of individual heating supply undertakings.

Possibilities

- To expand the range of users of centralised heating supply, connecting consumers using fossil heating fuel thereto.
- To improve planning for the development of heating supply systems in local governments by carrying out a comprehensive evaluation of the potential of high efficiency co-generation and efficient use of centralised heating supply and cooling.
- Upon emergence of new industrial consumers which might connect to centralised heating supply system, the efficiency of the system will increase.
- Use of income from selling the State emission quotas for the deployment of new and innovative RES technologies in heating supply.
- Further extended use of technologies of heat pumps in heating supply.
- More extensive use of local energy resources, particularly in centralised heating supply, for example, possibilities of geothermal energy and use of peat in generation of energy, taking into account the environmental, particularly air quality, requirements.

Threats

- Due to uncompetitive thermal energy tariff withdrawal of consumers from centralised heating supply is possible, replacing it with such individual or local heating supply which increases the level of emissions. Therefore, payments for heat consumers who will continue the use of measures of centralised heating supply will increase.
- Increased prices of energy resources upon increase in demand for biomass both in Latvia and outside its borders and decrease in demand for natural gas, thus increasing the costs of the system services for other users of the natural gas infrastructure.
- At individual places, dependence on one fossil heating fuel (natural gas) supplier causes safety risk to heating supply.
- In large concentration the air pollution caused by biomass, peat, and other energy resources has a negative effect on human health and environment.
- By promoting more extensive use of biomass in manufacturing and in incineration facilities used for energy generation, and without providing for the use of appropriate technologies for the purification of air pollution, risks for ensuring the planned air protection requirements may occur.
- Upon promoting more extensive use of biomass and peat in industry and in incineration facilities used for the generation of energy, the amount of ashes as the type of waste will increase.

4.4. Energy Efficiency

Strengths

- Increase of energy efficiency in multiapartment residential houses ensures the sustainability of the residential fund and efficient use of energy resources, as well as increase in the value of the property in renovated buildings.
- As a result of introduction of energy efficiency measures the amounts of energy used and, therefore, their costs decrease as a result of which investing of the released financial resources in other sectors of national economy is possible.
- Projects of increasing energy efficiency promote economic activity and employment, particularly in regions.
- Implementation of recommendations for energy audits and energy management systems, as well as timely implementation of energy efficiency measures increases the competitiveness of undertakings and the solvency of households.

- The amount of CO₂ and other emissions decreases, thus improving human health and improving the quality of life in long term.
- Rapid and cost-efficient reduction of safety risks of the supply of energy resources and promotion of growth, as well as increase in sustainability by reducing energy consumption.
- The comfort of staying increases in renovated buildings.
- Large proportion of high efficiency cogeneration for the thermal energy output which ensures savings of primary resources in the amount of more than 20 %.

Weaknesses

- Weak public understanding of energy efficiency issues and possibilities.
- Weak interest of merchants and inhabitants in energy efficiency measures with a pay-back period of more than 5 years.
- High costs of initial investments of individual energy efficiency measures, inability of consumers to bear the costs of energy efficiency measures.
- The ownership structure existing in multiapartment buildings makes it difficult for owners to take a decision on the renovation of the building.
- Drop in efficiency of the heating supply infrastructure already constructed due to the incompatibility of the current capacity with the load of consumers after implementation of the consumer energy efficiency measures.
- Insufficient number of companies with corresponding practice and experience which could implement qualitative energy efficiency measures.
- Insufficient supervision of the market of goods/products related to energy consumption which leads to distortion of the market and lost energy savings.

Possibilities

- Inclusion of energy efficiency as a horizontal objective of intersectoral policy in other policy fields, such as regional and urban development, transport, industrial policy, and agriculture.
- Facilitation of useful use of thermal energy by supporting heat insulation of buildings.
- Coordinated and planned improvement of energy efficiency of consumers and heating supply systems.
- Extensive introduction and popularisation of measures for increasing energy efficiency, including proactive market supervision measures, thus showing an example (model role in the field of energy efficiency).
- Use of the energy efficiency criteria within the framework of “Zaļais iepirkums” [Green procurement] in the public sector, achieving reduction in consumption of energy resources and environmental impact.
- Deployment of energy management in State institutions and local governments.
- Cooperation of energy supply merchants with energy consumers, including for the introduction of measures for raising the awareness and changing the behaviour of consumers.
- Tax reliefs for properties in which energy efficiency measures have been taken, or imposing of additional tax burden on properties in which energy efficiency measures are not being taken.
- Increase in value of the properties in which energy efficiency measures have been taken, and more extended duration of service.
- Market for new innovations is forming, improving energy efficiency, including for buildings.
- Establishment of energy service companies (providers of energy efficiency services) and contribution to implementation of energy efficiency measures.

Threats

- Cases in which the consumer invests in energy efficiency measures, but does not achieve the planned savings, diminishes the popularity of energy efficiency measures.
- Renovated property is being damaged as a result of flood or other natural disaster.
- In case of renovation the property insurance costs increase.
- Ageing of the living fund of Latvia, gradual disintegration of the multiapartment buildings that have not been renovated.
- Low involvement of final consumers in implementation of energy efficiency measures.
- If a significant part of the target of final energy savings will be attributed to the scheme of energy efficiency obligations, increase in energy prices and tariffs is to be expected.

4.5. Most Significant Problems to be Addressed

Electricity

1. Insufficient flow capacity of the electricity transmission interconnections of Latvia with the infrastructure of the electricity transmission network of the neighbouring countries resulting in different prices in the Latvia/Lithuania price district.

2. Administrative obstacles in constructing electricity transmission and distribution electricity networks.

3. Insufficient funds for the maintenance of the distribution electricity network which occur due to the great length of the distribution electricity network in regions with little network coverage, as well as due to the great length of the electricity network in regions covered in forests.

4. The energy system of the Baltics depends on activities of the third countries, therefore, issues of synchronisation of the Baltic States with Europe must be solved.

5. State aid mechanisms cause additional burden on final consumers.

6. The existing legal mechanism does not ensure balanced and coordinated aid policy for highly efficient use of co-generation and biomass.

7. Insufficient public knowledge of the principles of operation of the electricity market and the mechanisms of price formation (including the operation of the electricity exchange), advantages of the free market.

8. Insufficient public knowledge of efficient use of electricity (energy labelling).

Natural gas

1. The natural gas market is not liberalised as a result of which consumers are not able to fully use the advantages of the free market.

2. Lack of interconnections with other EU Member States (via the natural gas transmission system of Lithuania or Estonia) which, inter alia, hinders the development of the potential of underground gas storage facilities in Latvia.

3. Insufficiently diversified sources and routes of supply of natural gas, therefore, large dependence on one supplying country. Upon development of supply routes of natural gas in Estonia and Finland, there will be a lack of reverse natural gas flows from Estonia to Latvia.

4. Insufficient capacity of the Latvia–Lithuania interconnection in order to cover the demand for natural gas of Latvia in case when there is extremely high demand for natural gas and disruption in the supply of natural gas from Inčukalns UGSF.

5. Lack of a regulation that would lay down requirements for the introduction of gas produced from biogas and biomass, power-to-gas (e-methane), as well as liquefied natural gas into the natural gas distribution system.

6. It would be important to expand Inčukalns UGSF for the regional safety needs.

Heating Supply

1. Insufficient development and efficiency of the existing centralised heating supply infrastructure.
2. Due to the impact of the increased prices of energy resources and other factors, including upon termination of the term of aid to high efficiency cogeneration plants, heat tariffs increase, urging consumers to refuse from the centralised heating supply.
3. Large debts of inhabitants for heat which cause risk to the solvency of heat undertakings.
4. A comprehensive evaluation of the centralised heating supply system and co-generation potential has not been carried out for Latvia which would improve planning of the construction of new heating supply objects.
5. Using biomass and other local resources in energy supply, increased emissions of air polluting substances which has a negative effect on human health and environment, is possible.

Energy Efficiency

1. The costs of achieving the target of the mandatory final energy consumption savings conforming to the requirements of the Energy Efficiency Directive are high. The target cannot be achieved only by energy efficiency policy measures purposefully introduced by the State, therefore, depending on the progress achieved it will be necessary to create a scheme of energy efficiency obligations, creating it with the potentially least impact on energy prices and tariffs.
2. Lack of administrative capacity for the provision of the implementation of the scheme of energy efficiency obligations (in accordance with Directive 2012/27/EU), including in relation to the procedures and regulation of its functioning and administration.
3. Lack of resources for the provision of wholesome market supervision measures (in accordance with Directive 2010/30/EU, Directive 2009/125/EC, and the relevant implementation/delegated act).
4. Lack public interest in energy efficiency measures and insufficient awareness of the possibilities of using the services provided by energy service companies (hereinafter – the ESCO).
5. Lack of involvement of credit institutions in aid to renovation of buildings.
6. Overly high limit value of thermal energy consumption (200 kWh/m² per year) of a multiapartment building has been specified in the laws and regulations, starting from which the building manager and the apartment owner must take measures for the improvement of thermal insulation of the building.

5. Planning of the Subsequent Actions

Policy target defined in the Guidelines	Competitive economy which is ensured by: – continuous and safe energy supply, efficient use of resources which is the basis for sustainable energy.					
Tasks and main measures for achieving the specified target	Term of execution	Responsible institution	Involved institutions	Necessary financing and its sources	Link to the policy result and performance indicator	
Action direction for achieving the target	<i>1. Diversification of primary energy resources</i>					

1.1. To promote the exploration and extraction of primary energy resources in Latvia					
1.1.1. To evaluate the possibilities of peat and geothermal energy extraction, and efficient use of other alternative sources, and the circumstances related to their extraction, taking into account the environmental impact of its extraction and use.	2017–2018	MoE, MoEPRD	MoT, MoW, MoF, MoA, LALRG	Within the framework of the funds granted from the State budget	1.1.PR
1.1.2. To promote the development of the intergovernmental contract between Latvia and Lithuania on economic cooperation in the economic zone and continental shelf of the Baltic Sea by participating in working groups.	2016–2020	MoFA, MoE	MoD, MoEPRD, MoT	Within the framework of the funds granted from the State budget	
1.2. To promote diversification of the supply routes and sources of energy resources					
1.2.1. To promote the development of natural gas interconnections by defending the positions of Latvia, agreeing on the EU list of projects of common interests, agreeing on financial conditions and implementation of projects.	2016–2020	MoE	MoFA, MoEPRD, MoT	Within the framework of the funds granted from the State budget, EU ESI co-financing, private capital investments	2.2. PR
1.2.2. To defend the interests of Latvia by agreeing on the development of a commercially	2016–2020	MoE, private investors	MoFA, MoEPRD	Within the framework of the funds granted from the State budget, EU ESI co-financing,	2.2. PR

advantageous project for the regional liquefied natural gas terminal.				private capital investments ⁵⁰	
1.2.3. To promote the use of different combustible gases in national economy by developing regulation for the use of combustible gases.	2017–2018	MoE, MoT	MoEPRD, merchants	<i>Within the framework of the funds granted from the State budget</i>	
1.3. Waste processing					
1.3.1. To evaluate the possibilities to facilitate waste disposal in energy generation and the possibilities to deploy pilot projects.	2016–2020	Local governments, MoEPRD	MoA, MoT, regional structures	<i>Local government budget, within the framework of the funds granted from the State budget, EU funds, funds of undertakings</i>	1.1. PR
Action direction for achieving the target	2. Establishment of an effective energy market				
2.1. Active participation in the development of the EU network codes for the improvement of the EU energy market					
2.1.1. Development and deployment of the EU network codes for the improvement of the EU electricity market.	2016–2020	MoE, MoF	PUC, transmission system operation (AST AS)	<i>Within the framework of the funds granted from the State budget</i>	2.1. PR
2.1.2. Development and deployment of the EU network codes for the improvement of the EU natural gas market ⁵¹ .	2016–2020	MoE	PUC, transmission system operation (LG AS)	<i>Within the framework of the funds granted from the State budget</i>	2.2. PR
2.2. To reduce the risk of price instability in wholesale trade of electricity					
2.2.1. To promote the operation of the Nasdaq OMX Commodities exchange market of financial contracts in	2016–2020	AST AS	MoE, MoF	<i>Within the framework of the funds granted from the State budget</i>	2.1. PR

the price zone of Latvia.					
2.3. To liberalise the electricity market for households					
2.3.1. To develop and deploy a mechanism for compensating the costs of electricity for poor and low income persons and other groups of protected consumers, as well as to evaluate the system after its deployment and to improve its operation if necessary.	2016–2020	MoE, MoW	MoE, MoEPRD, PUC, CRPC, MoF	Within the framework of the funds granted from the State budget: In sub-programme 29.02.00 “Aid to consumers of electricity” of the Ministry of Economics in 2016 8 931 500 euro, in 2017 and 2018 12 102 624 euro. The provisional financing necessary in 2019 and 2020 each year – 12 102 624 euros.	
2.3.2. To inform household of the latest news of the electricity market, the principles and advantages of operation.	2016–2020	MoE, JSC ST	MoW, MoEPRD, CRPC, PUC, local governments, mass media	Within the framework of the funds granted from the State budget, private funds	
2.4. To separate the natural gas transmission and storage services from the trade and distribution services					
2.4.1. To develop amendments to the Energy Law in relation to the liberalisation measures of the natural gas market, as well as other legal acts provided for in amendments.	2016–2017	MoE	PUC, MoI	Within the framework of the funds granted from the State budget	2.2. PR
2.4.2. To draw up the Natural Gas Market Law.	2016–2017	MoE	PUC	Within the framework of the funds granted from the State budget	2.2. PR
2.4.3. To implement the separation model of the transmission and storage system operator and to	2016–2017–2020	Latvijas Gāze AS; Transmission and storage system operator	MoE, PUC	Within the framework of the financial resources of Latvijas Gāze AS, within the	2.2. PR

improve its operation.				<i>framework of the funds granted from the State budget</i>	
Action direction for achieving the target	3. Efficient energy infrastructure				
3.1. To simplify the process for the implementation of PCI projects.					
To strengthen the status and functions of the MoE as the competent authority within the meaning of Regulation 347/2011 by developing a draft law on the ESI instrument and the related Cabinet regulations.	2016–2017	MoT	MoE, MoEPRD	<i>Within the framework of the funds granted from the State budget</i>	
3.1.2. After approval of the EU Project of Common Interest to grant the status of projects of national significance to the PCI to be implemented in Latvia.	2016–2020	MoE	MoEPRD, MoT	<i>Within the framework of the funds granted from the State budget</i>	2.1, 2.2 PR
3.2. To improve the electricity transmission system infrastructure.					
3.2.1. Construction of the third stage of Kurzemes loks	2016–2019	AST AS, LET AS	MoW, MoEPRD, MoT, PUC	<i>Eligible costs 122.42 mill. euros CEF (49 % co-financing – 55.09 mill. euros), capital investments of the Augstsprieguma tīkls AS and LET AS</i>	2.1. PR
3.2.2. Third interconnection of Estonia–Latvia	2016–2020	AST AS, LET AS	MoE, MoFA, MoEPRD, MoT, PUC	<i>Eligible costs 172.77 mill. euros CEF (65% co-financing – 122.30 mill. euros), capital investments of the Augstsprieguma tīkls AS and LET AS</i>	2.1. PR
3.2.3. To promote integration in the European electricity	2016–2020	MoE, AST AS	MoFA	<i>Within the framework of the funds granted from</i>	2.1. PR

network, henceforth defining projects of importance to Latvia, achieving their inclusion in the EU PCI list, as well as involving in identification of the optimal solution for implementation of the synchronisation project.				<i>the State budget, capital investments of Augstsprieguma tīkls AS and LET AS</i>	
3.3. To improve the safety of the electricity distribution system and to modernise the electricity network.					
3.3.1. To renew the electricity transmission lines, transformer substations, power switches, substations, distribution points, erasers, and the outdated electricity network of Riga city.	2016–2020	<i>Sadales tīkls AS</i>	<i>MoE, PUC</i>	<i>Capital investments of Sadales tīkls AS</i>	
3.3.2. To implement the introduction of automation of distribution electricity networks and smart electricity metering.	2016–2020	<i>Sadales tīkls AS</i>	<i>MoE, MoEPRD</i>	<i>Capital investments of Sadales tīkls AS</i>	
3.3.3. To construct a medium voltage cable network according to the development plan of the <i>Sadales tīkls AS</i>	2016–2020	<i>Sadales tīkls AS</i>	<i>MoE, MoEPRD</i>	<i>Capital investments of Sadales tīkls AS</i>	
3.3.4. To construct a new 110 kV substations in order to ensure safe and qualitative electricity supply.	2016–2020	<i>Augstsprieguma tīkls AS, LET AS</i>	<i>MoE, MoEPRD</i>	<i>Capital investments of Sadales tīkls AS, capital investments of AST AS</i>	
3.3.5. To address the issues of operation of ownerless 20/0.4 kV electric networks.	2016–2020	<i>MoE, Sadales tīkls AS</i>	<i>PUC</i>	<i>Within the framework of the funds granted from the State budget</i>	
3.4. To improve the natural gas distribution,					

transmission and storage system infrastructure.					
3.4.1. Modernisation and expansion of Inčukalns UGSF ⁵² .	2016–2020	Storage system operator, MoE	MoEPRD, PUC	ESI financing, funds of the storage system operator ⁵³³	2.2. PR
3.4.2. To improve the regulation in the field of construction of the gas supply system.	2016–2017	MoE	MoEPRD	Within the framework of the funds granted from the State budget	2.2. PR
3.5. To improve the normative regulation for infrastructure of another type					
3.5.1. To develop amendments to the laws and regulations, specifying the regulation for requirements in protection zone around gas refuelling stations for motor vehicles.	2016	MoE	MoT, MoEPRD, local governments	Within the framework of the funds granted from the State budget	
3.5.2. To develop amendments to the laws and regulations, specifying the regulation for requirements in protection zone around pipelines of oil and oil products.	2016	MoE	MoFA, MoF, MoI, MoT, MoEPRD, local governments	Within the framework of the funds granted from the State budget	
3.5.3. To reduce the bureaucratic burden in the field of construction of transmission and distribution electricity networks.	2016–2020	MoE, MoEPRD	local governments	Within the framework of the funds granted from the State budget	2.1. PR
Action direction for achieving the target	4. Efficient thermal energy market				
4.1. Improvement of the normative regulation.					
4.1.1. To develop a draft law on the thermal energy market and the laws and regulations subject thereto.	201.	MoE	MoEPRD, PUC, LALRG, NGO	Within the framework of the funds granted from the State budget	1.1, 1.3, 1.4, 1.7 PR
4.1.2. To perform a comprehensive evaluation of the	2016	MoE	MoEPRD, PUC, LALRG, NGO	Within the framework of the	1.1, 1.3., 1.4., 1.7 PR

potential of high efficiency co-generation and efficient use of centralised heating supply and cooling (including also mapping of centralised heating supply systems according to financial possibilities).				<i>funds granted from the State budget</i>	
4.1.3. To evaluate efficient use of ashes occurring in incineration facilities with the nominal thermal output above 5 MW in forestry	2017	MoA	MoEPRD	<i>MoA will need additional funds from the State budget, indicatively 300 000 euros</i>	1.1, 1.3., 1.4., 1.7 PR
4.2. Establishment, organisation, and development of the infrastructure					
4.2.1. Reconstruction and construction of centralised heating supply heat sources and transmission and distribution systems.	2016–2020	MoE	<i>Heat undertakings, local governments</i>	<i>Specific objective 4.3.1 “To promote energy efficiency and use of local RES in centralised heating supply” Co-financing of the EU Cohesion Fund indicatively – 53.19 mill. euros; capital investments of undertakings</i>	1.1, 1.3., 1.4., 1.7 PR
4.2.2. To promote the use of biomass and peat in energy supply, granting aid of the European Union funds thereto, to ensure the installation of corresponding purification technologies for restricting emissions of air polluting substances caused by such facilities.	2016–2020	MoE, MoEPRD	<i>Heat undertakings, local governments</i>	<i>Specific objective 4.3.1 “To promote energy efficiency and use of local RES in centralised heating supply” Co-financing of the EU Cohesion Fund indicatively – -53.19 mill. euros; capital investments of undertakings</i>	1.1, 1.3., 1.4., 1.7 PR
Action direction for achieving the target	5. Increase of the share of RES				
5.1. To implement measures to increase					

the share of RES in gross final energy consumption.					
5.1.1. Preservation of the mandatory procurement component of electricity in the amount of 26.79 EUR/MWh until 1 April 2019.	2016–2019	MoE	MoF	Within the framework of the funds granted from the State budget In sub-programme 29.02.00 “Aid to consumers of electricity” of the Ministry of Economics In 2016 – 59 693 445 euros, in 2017 – 81 050 027 euros, in 2018 – 89 892 692 euros. The provisional financing necessary in 2019 – 23 169 540 euros.	I.1. PR
5.1.2. The revision of the existing aid mechanism for the generation of electricity according to the EC Guidelines on State Aid to Environmental Protection and Energy for 2014–2020 (published on 28 June 2014).	2016	MoE	MoF	Within the framework of the funds granted from the State budget	I.1. PR
5.1.3. To develop amendments to the laws and regulations governing mandatory electricity procurement and guarantee charge for the capacity installed in the electricity plant, taking into account the results of coordination with the EC.	2016	MoE	MoF, MoEPRD, MoA, NGO	Within the framework of the funds granted from the State budget	I.1. PR
5.1.4. To develop a new State aid mechanism for the generation of electricity using the RES in accordance with the EC Guidelines on State	2018	MoE	MoF, MoEPRD, MoA, MoT, NGO	Within the framework of the funds granted from the State budget	I.1. PR

Aid to Environmental Protection and Energy for 2014–2020 (published on 28 June 2014).					
5.1.5. To coordinate the new State aid mechanism for the generation of electricity using the RES with the EC	2018–2019	MoE	MoF	Within the framework of the funds granted from the State budget	I.1. PR
5.1.6. To deploy a State aid mechanism for energy intensive merchants of manufacturing industry.	2016–2020	MoE	MoF	Within the framework of the funds granted from the State budget: In sub-programme 29.02.00 “Aid to consumers of electricity” of the Ministry of Economics In 2017 – 3 500 000 euros, in 2018 – 7 000 000 euros. The provisional financing necessary in 2019 and 2020 each year – 7 000 000 euros.	I.1. PR
5.1.7. To prepare and submit reports to the EC on the progress achieved in relation to the objective of the proportion of the energy generated from the RES.	2017, 2019	MoE	MoEPRD, MoA, MoF, CSB, PUC	Within the framework of the funds granted from the State budget	I.1. PR
5.1.8. During the process of preparation of the annual State budget to perform the evaluation of the subsidised electricity tax and, if necessary, reviewing thereof.	2017, 2018, 2019	MoE	MoF, MoA, SRS	Within the framework of the funds granted from the State budget	I.1. PR
5.1.9. To improve the system of evidence of origin in accordance with the principles of the European Energy Certificate System	2017	MoE	MoF, SRS, NGO	Within the framework of the funds granted from the State budget	I.1. PR

and to introduce a functional State register of evidence of origin.					
5.1.10. To evaluate the necessity of making amendments to the methodology of calculation of the natural resources tax, using comparable conditions in relation to all HPPs.	2016	MoEPRD	MoE, MoF, NGO	Within the framework of the funds granted from the State budget	1.1. PR
5.1.11. To prepare and submit a Cabinet report on the additional measures necessary for the achievement of the RES target.	2016	MoE	MoEPRD, MoA, MoT, MoF, NGO	Within the framework of the funds granted from the State budget	1.1. PR
5.2. To implement measures to increase the share of energy generated from the RES in final energy consumption in transport					
5.2.1. To coordinate the reduced rate of excise duty B100 with the European Commission.	2016	MoE	MoF	Within the framework of the funds granted from the State budget	1.2. PR
5.2.2. To ensure the conformity of biomass and biofuel with the sustainability criteria, taking into account changes in the ILUC Directive.	2016	MoE	MoA, MoEPRD, NGO	Within the framework of the funds granted from the State budget	1.2. PR
5.2.3. To evaluate the possibilities for generation and use of second generation biofuel and other sustainable biofuels, inter alia, generation of e-fuel, using hydrogen technologies.	2016	MoE	MoA, MoEPRD, NGO	Within the framework of the funds granted from the State budget	1.2. PR
5.2.4. Electrification of the EW railway corridor and Pieriga routes of passenger trains with 25 kV	2016–2020	LDZ	MoT	Specific Objective 6.2.1 “To ensure competitive and environment-friendly TEN-T	1.2. PR

alternating voltage (Cabinet Order No. 683 of 27 December 2013, On the Transport Development Guidelines for 2014–2020).				railway network, promoting its safety, quality and capacity”, Measure 6.2.1.2 “Electrification of the railway network of Latvia” (co-financing of the EU Cohesion Fund – 346.63 mill. EUR and capital investments of the undertaking).	
5.2.5. To develop an environment-friendly public transport infrastructure (Cabinet Order No. 683 of 27 December 2013, On the Transport Development Guidelines 2014–2020).	2016–2020	MoT	local governments	4.5.1. To develop an environment-friendly public transport infrastructure. Co-financing of the EU Cohesion Fund – 108.52 mill. euros; capital investments of undertakings	1.2. PR
5.2.6. To implement the Electromobility Development Plan for 2014–2016 ⁵⁴ .	2016	MoT	MoE, MoEPRD, local governments	4.4.1. To develop the infrastructure for charging EVs in Latvia. Co-financing of the EU, European Regional Development Fund (hereinafter – the ERDF) – 7.09 mill. euros, financing from the State budget	1.2. PR
5.2.7. ⁵⁵ To promote the development of zero emissions transport in Riga city.	2016–2020	Riga City Council	Rīgas satiksme SIA	4.5.1. To develop an environment-friendly public transport infrastructure. Co-financing of the EU Cohesion Fund, funds from the local government budget, capital investments of the undertaking	1.2. PR
Action direction for achieving the target	6. Improved energy efficiency				
6.1. Improvement and implementation of the normative regulation					

6.1.1. To develop and submit to the Cabinet the draft laws and regulations necessary for the implementation of the energy efficiency policy.	2016	MoE	MoF, MoEPRD, PMB, LALRG, MoT, SFRS, MoA, CRPC, SCCB	Within the framework of the funds granted from the State budget	1.3, 1.4, 1.5, 1.6, 1.7 PR
6.1.2. To develop the State energy efficiency action plan and to submit it to the EC.	2017, 2020	MoE	MoEPRD, MoT, MoF, MoA, PUC, CRPC, SCCB	Within the framework of the funds granted from the State budget	1.3, 1.4, 1.5, 1.6, 1.7 PR
6.1.3. To develop local and regional sustainable energy development plans, taking into account the prepared methodological instructions.	2016–2020	Local governments, planning regions	MoEPRD, MoE	Local government budget	1.3, 1.4, 1.5, 1.6, 1.7 PR
6.1.4. To continue consultations with the interested parties, including bank sector, regarding promotion of the development of ESCO.	2016	MoE	MoF, MoEPRD	Within the framework of the funds granted from the State budget	1.3, 1.4, 1.5, 1.6 PR
6.1.5. To introduce guidelines for conducting the green procurement: “Plan for the Promotion of Green Procurement for 2015–2017”.	2016–2017	MoEPRD	Sectoral ministries, PMB, local governments	Within the framework of the funds granted from the State budget	1.3, 1.4, 1.5, 1.6, 1.7 PR
6.2. Improvement of energy efficiency in buildings					
6.2.1. To implement the measures for the improvement of energy efficiency in State buildings.	2016–2020	MoE	MoF, institutions of direct State administration	4.2.1.2. To promote increasing of energy efficiency in State buildings. EU ERDF financing – 97 857 972 euros, financing from the State budget within the scope of Measure 4.2.1.2 – 17 269 055 euros.	1.6. PR
6.2.2. To implement the energy efficiency measures in multiapartment buildings.	2016–2020	MoE	Local governments, apartment owners and managers in	4.2.1.1. To promote increasing of energy efficiency in residential buildings.	1.3, 1.4, 1.5, 1.7 PR

			<i>multiapartment buildings</i>	<i>EU ERDF co-financing – 150 000 000 euros and financing from the State basic budget</i>	
6.2.3. To implement the energy efficiency measures in local government buildings.	2016–2020	<i>MoEPRD</i>	<i>MoF, MoE, local governments</i>	<i>4.2.2. According to the integrated development programmes of the local government to promote increasing of energy efficiency and use of RES in local government buildings. EU ERDF co-financing – 31.39 mill. euros; funds from the local government budget</i>	1.3, 1.4, 1.5, 1.6, 1.7 PR
6.3. Increasing of energy efficiency in the industrial sector					
6.3.1. To promote increasing of the energy efficiency of the operation of undertakings by deploying an energy audit and energy management system, activating the role of the sectoral association for the promotion of energy efficiency, promoting a discussion on the determination of benchmarks of energy consumption in the sector.	2016–2020	<i>MoE</i>	<i>MoT, MoA, MoF</i>	<i>Within the framework of the funds granted from the State budget</i>	1.3, 1.4, 1.5 PR
6.3.2. To implement energy efficiency measures in the industrial sector	2016–2020	<i>MoE</i>	<i>Sectoral associations, entrepreneurs</i>	<i>4.1.1. To promote efficient use of energy resources, reduction of energy consumption, and transition to RES in the sector of manufacturing industry. Co-financing of the EU Cohesion Fund in the amount of</i>	1.3, 1.4, 1.5 PR

				32 555 030 euros, State basic budget	
6.4. Raising public awareness and building public education on the usefulness of energy efficiency					
6.4.1. To raise public awareness and build its education on different possibilities and practice of increasing energy efficiency.	2016–2020	MoE	MoT, MoA, MoF	Within the framework of the funds granted from the State budget, EU financing within the framework of the Technical Assistance Project of the Ministry of Economics	1.3, 1.4, 1.5 PR
6.4.2. To promote deployment of smart energy meters, raising the awareness of consumers of their energy consumption and creating an opportunity to regulate it and reduce the quantity of consumed energy resources.	2016–2020	MoE	MoF, sectoral associations, entrepreneurs	Within the framework of the funds granted from the State budget	1.3, 1.4, 1.5, 1.7 PR
6.5. Introduction of the ecodesign requirements					
6.5.1. To introduce the normative regulation in relation to the application of the ecodesign and ecolabelling requirements, including by performing a wholesome aggregate of market supervision measures.	2016–2020	MoE, MoEPRD	CRPC	Within the framework of the funds granted from the State budget, the CRPC will need additional funds from the State budget – the provisional amount of the first financing is 226 000 euros (and in subsequent years approximately 207 524 euros).	1.3, 1.4, 1.7 PR
Action direction for achieving the target	7. Efficient management of a crisis situation				
7.1. To ensure national economy with energy supply in case of endangerment					

7.1.1. To evaluate the procedures for supplying the objects having importance to national economy with energy resources in case of an endangerment to the State.	2016	MoE	MoEPRD, MoT, MoW, MoF, MoJ, MoI	Within the framework of the funds granted from the State budget	
7.1.2. To evaluate the necessity and procedures for maintaining the natural gas reserves.	2016	MoE	MoF, MoI	Within the framework of the funds granted from the State budget	
7.1.3. To perform safety evaluation of the natural gas supply (N-1) in cooperation with the Baltic States, including Finland, and to develop the relevant report.	2016–2020	MoE, transmission and storage system operator	MoF, MoEPRD, MoI, MoFA	Within the framework of the funds granted from the State budget, private funds	
7.1.4. To update the evaluation of the safety risk of natural gas supply of Latvia and the Preventive Action Plan, and the Emergency Action Plan.	2016–2020	MoE, transmission and storage system operator	MoEPRD, MoI, MoF	Within the framework of the funds granted from the State budget, private funds	
7.2. To ensure oil stocks					
7.2.1. To call for an open tender for the “provision of the safety reserve service for the establishment of the State (Republic of Latvia) reserve of oil products”.	2016–2020	MoE	MoF	Within the framework of the funds granted from the State budget.	
7.2.2. To ensure the amount of oil stocks ⁵⁶ , which conforms to at least the daily average net import quantities.	2016–2020	Merchants	MoE, MoF	Within the framework of the funds granted from the State budget ⁵⁷ : in the sub-programme 29.01.00 “Maintenance of the reserves of oil products” of the Ministry of Economics in 2016 – 19 124 048 euros	

				in 2017 – 25 928 645 euros in 2018 – 29 266 917 euros Expenses for 2019 and 2020 will be planned according to the forecast of the revenue from the State fee	
Action direction for achieving the target	8. Strengthening of International and Regional Cooperation				
8.1. To take active participation in the work of the BEMIP					
8.1.1. To regularly participate in BEMIP meetings and to defend the interests of Latvia.	2016–2020	MoE	MoFA, MoEPRD, MoT, AST AS	Within the framework of the funds granted from the State budget	2.1, 2.2 PR
8.2. To promote cooperation with Estonia and Lithuania, as well as with other countries of the region					
8.2.1. To regularly participate in the meetings of the High-level Baltic Committee of the Baltic Council of Ministers.	2016–2020	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget, private funds	2.1, 2.2 PR
8.2.2. To organise events of the BCM during presidency of Latvia in the Baltic Council of Ministers.	2016, 2019	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget, private funds	2.1, 2.2 PR
8.2.3. To participate in the meetings on energy issues of the Nordic–Baltic cooperation format (NB8 cooperation format), as well as to organise meetings on energy issues during the time when Latvia will be the coordinating country of NB8 format.	2016	MoE	MoFA	Within the framework of the funds granted from the State budget, private funds	2.1, 2.2 PR
8.4. To coordinate the Energy Priority of the Strategy of the Baltic Sea Region					

8.4.1. To evaluate the Seed Money projects in the field of energy.	2016–2020	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget, private funds, INERREG EU financing for the implementation of projects	
8.4.2. To organise and regularly participate in the measures in relation to energy issues and to defend the interests of Latvia	2016–2020	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget	
8.5. To promote active participation of Latvia in international organisations					
8.5.1. To participate in the work of the European Energy Community and to defend the interests of Latvia.	2016–2020	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget	
8.5.2. To participate in measures of the Energy Charter, as well as participate in the development of its new wording and to defend the interests of Latvia.	2016–2020	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget	
8.5.3. To promote bilateral contacts in the field of energy, including when solving energy issues during bilateral cross-border meetings.	2016–2020	MoE	MoFA, MoEPRD	Within the framework of the funds granted from the State budget	
8.5.4. To promote the participation of cities of the Republic of Latvia in the “Pilsētu mēru pakts” [Pact of City Mayors] and “Viedo pilsētu un pašvaldību sadarbība” [Cooperation of Smart Cities and Local Governments]	2016–2020	Local governments	MoE, MoEPRD	Local government budget	

in order to achieve an increase in activity of local governments for the achievement of the State energy targets.					
Action direction for achieving the target	9. Provision of information to the public regarding developments in the energy sector				
9.1. To raise public awareness of the events in the energy sector					
9.1.1. To regularly organise meetings of the Energy Subcommittee of the National Economy Council and to ensure its effective operation.	2016–2020	MoE	NGO, sectoral representatives	Within the framework of the funds granted from the State budget.	
9.1.2. When new legal acts are adopted in the energy sector, to prepare press releases and, if necessary, to organise press conferences, as well as to use other popular means of communication to inform the inhabitants of the envisaged changes.	2016–2020	MoE	NGO, press representatives	Within the framework of the funds granted from the State budget, private funds	
Action direction for achieving the target	10. Innovative solutions for problems in the energy sector				
10.1. To ensure the institutional framework for the cooperation of the State and entrepreneurs					
10.1.1. To promote the establishment of strong scientific institutions in the field of energy by locating competence centres and centres for the transfer of technologies in the field of energy in scientific institutions, strengthening the link between	2016–2020	MoE	MoFA, MoEPRD, MoT, MoH, MoES, institutions of higher education, research institutions	Financing of the European Union Structural Funds (Sub-activity 2.1.2.1.1 “Competence Centres” of the supplement to the operational programme “Entrepreneurship and Innovations”), within the	

scientific institutions and the entrepreneurial sector, and commissioning the development of solutions topical for the energy sector, their approbation and deployment on the market.				<i>framework of the funds granted from the State budget, private funds</i>	
10.1.2. To develop a new, interdisciplinary State research programme in the field of energy which forms the knowledge basis for innovations in all the thematic areas included in the Guidelines.	2016–2020	MoES, MoE	<i>MoFA, MoEPRD, MoT, MoH, MoES, scientific institutions</i>	<i>Within the framework of the funds granted from the State budget. The necessary provisional State financing: 1) MoES in 2018 and 2019 each year 1 mill. euro; 2) MoE in 2018 and 2019 each year 1 mill. euro.</i>	
10.1.3. To evaluate the procurement of innovations, including in the field of energy, and, if necessary, to develop guidelines.	2016–2020	<i>MoE</i>	MoES, MoF	<i>Within the framework of the funds granted from the State budget</i>	
10.1.4. To provide aid measures for promoting the participation in the EU programme “Horizon”.	2016–2020	SEDA, IDAL	<i>Scientific institutions, MoE, MoFA, MoEPRD, MoT, MoH, local governments</i>	<i>SO 1.1.1.5 Aid to international cooperation projects in research and innovations, co-financing of scientific institutions</i>	
10.2. To promote the development of Smart Specialisation in the field of energy					
10.2.1. To develop and submit for examination at a Cabinet meeting the Informative Report on the Implementation of the Smart Strategy in the field of energy.	2016	MoE	<i>MoES, scientific institutions</i>	<i>Within the framework of the funds granted from the State budget</i>	
10.2.2. Upon co-operation of institutions of higher education,	2016–2020	MoES, MoE	<i>MoEPRD, institutions of higher education,</i>	<i>Financing of the European Union Structural Funds (SO 8.2.1 “To</i>	

researchers, and entrepreneurs to develop new, innovative interdisciplinary study programmes and to develop interdisciplinary research in the fields of Smart Specialisation for solving the problems of the energy sector.			<i>scientific institutions</i>	<i>reduce fragmentation of the study programmes and to strengthen the joint use of resources” of the operational programme “Growth and Employment”, within the framework of the funds granted from the State budget, private funds</i>	
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Sectoral representatives, non-governmental organisations, and scientific institutions will be involved in the implementation of the provided measures.

6. Impact of the Policy on the State and Local Government Budget

The financial sources planned for the implementation of the Guidelines are the State and local government budget, funds from the EU Connecting Europe Facility, financing from the EU funds, as well as private capital. Implementation of the measures provided by the Guidelines from the State budget in 2016 will be ensured within the framework of the resources granted to the abovementioned measures.

Starting from 2017 and in subsequent years the issue of granting additional funds from the State budget for the measures referred to in the draft Guidelines is to be assessed at the Cabinet in the process of preparing the draft State budget for the current year by examining all requests for new policy initiatives and taking into account the financial possibilities of the State budget.

¹ Approved at the Cabinet meeting, protocol No. 32, Par. 59 (TA-378);

² Approved at the Cabinet meeting, protocol No. 29, Par. 39 (TA-1045);

³ conclusions of the European Council of 8/9 March 2007 –

https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/93135.pdf

⁴ COM (2011) 112 A Roadmap until 2050 – <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0112>

⁵ Conclusions of the European Council of 24 October 2014 – <http://data.consilium.europa.eu/doc/document/ST-169-2014-INIT/en/pdf>

⁶ Non-ETS sectors – the agriculture and transport sector (except for international aviation and international maritime transport), small industrial undertakings, households (including their heating), and the waste management sector.

⁷ RES targets of other EU Member States – in the Annex to Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable resources and amending and subsequently repealing Directives 2001/77/EC and 3003/30/EC;

⁸ Energy efficiency targets of other EU Member States – <http://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive>;

⁹ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC;

¹⁰ Approved with the Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community’s greenhouse gas emission reduction commitments up to 2020, jointly adopted by the European Parliament and the Council (<http://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32009D0406&from=EN>);

¹¹ Targets for the reduction of GHG emissions of other EU Member States – http://ec.europa.eu/clima/policies/g-gas/docs/kyoto_progress_2014_en.pdf;

¹² The target is indicated in relation to all three Baltic States together prior to the implementation of PCI. Source: Communication from the Commission to the European Parliament and the Council Achieving the 10 % electricity interconnection target Making Europe's electricity grid fit for 2020. Brussels, 25.2.2015 COM(2015) 82 final

¹³ The RES Directive lays down that the RES target for each Member State is determined through the use of normalised indicators, i.e., the share of RES in the gross final energy consumption;

¹⁴ Study of Dr. Sc. Ing J. Strūbergs and Mg. Sc. Ing K. Siļķe, Assessment of the Hydro-energetic Potential of Small and Medium Rivers of Latvia, 20 February 2012;

¹⁵ Cabinet Regulation No. 27 of 15 January 2002, Regulations Regarding Rivers (River Sections) on which It is Prohibited to Construct and Restore Sluices of Hydroelectric Power Plants for the Purpose of Protecting Fish Stocks and to Create Any Mechanical Obstacles;

¹⁶ Costs of renewable energy technologies –

https://www.irena.org/DocumentDownloads/Publications/RE_Technologies_Cost_Analysis-SOLAR_PV.pdf;

¹⁷ Solar energy technologies – http://www.irena.org/DocumentDownloads/Pressrelease/G20_Toolkit.pdf;

¹⁸ A. Blumberga, G. Bažbauers, etc. Study *Latvijas atjaunojamo energoresursu izmantošanas un energoefektivitātes paaugstināšanas modelis un rīcības plāns* (RTU, 2009);

¹⁹ Exploration and extraction of hydrocarbons – https://www.em.gov.lv/lv/nozares_politika/zemes_dzilu_izpete/;

²⁰ Information of the Latvian Association of Peat Producers.

²¹ Industry and construction (NACE Rev. 2, except for 07.21, 08, 09.9, 10–32, 41–43), transport (NACE Rev. 2, 49–51), households (NACE Rev. 2, 97–98), commercial services and public services (NACE Rev. 2, 33, 36–39, 45–47, 52–96, 99), agriculture, forestry, hunting, fishery (NACE Rev. 2, 01–03).

²² The development forecast of generating capacities in which power plants that are accepted for operation or are closed according to the information at the disposal of the transmission system operator (hereinafter also – the TSO) are being taken into account.

²³ Tariffs of the distribution system – http://www.sadalestikls.lv/files/newnode/infodudok/majas%20lapa_tarifi_LVL_no_01.01.2014.EUR_2.pdf;

²⁴ Evaluation of the European Commission – http://eur-lex.europa.eu/resource.html?uri=cellar:4f8722ce-1347-11e5-8817-01aa75ed71a1.0001.02/DOC_1&format=PDF

²⁵ Study of Dr. Sc. Ing J. Strūbergs and Mg. Sc. Ing K. Siļķe, *Latvijas mazo un vidējo upju hidroenerģētiskā potenciāla vērtējums*, 20 February 2012;

²⁶ Cabinet Regulation No. 27 of 15 January 2002, Regulations Regarding Rivers (River Sections) on which It is Prohibited to Construct and Restore Sluices of Hydroelectric Power Plants for the Purpose of Protecting Fish Stocks and to Create Any Mechanical Obstacles;

²⁷ Wind energy technologies – https://ec.europa.eu/energy/sites/ener/files/documents/2014_iem_communication_0.pdf;

²⁸ Guidelines on State aid for environmental protection and energy – <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:C:2014:200:FULL&from=EN>;

²⁹ Approved with Order no. 567 of 17 September 2015 (prot. No. 43, par. 2)

³⁰ Negative price of electricity is a generally accepted term which means that at the specific moment of time electricity price on the market is lower than 0. Negative prices occur when a very low demand coincides with high offer. Cases of low demand may be, for example, on public holidays and on Sunday nights which are heightened by the potential fluctuations in industrial activity due to economic crisis. In turn, a typical situation of high demand is caused by high supply of wind power to the network. A network operator which has been assigned to accept as priority the energy generated in a wind power plant into the network in order to achieve market balance submits an offer to the exchange for such energy with negative price. The electricity generated in traditional power plants may also be auctioned on the market for a negative price. For example, in cases when a power plant is generating energy for a price which exceeds the marginal generation costs, coordinating generation of any particular hour with demand in other hours, if it is economically more advantageous to leave the plant working at a particular hour when losses caused by the negative price are less than the costs caused by changing the generation schedule;

³¹ high efficiency natural gas cogeneration plants with electric capacity of up to 4 MW or also plants which use RES without a capacity restriction which provide centralised heating supply systems with thermal energy; high efficiency cogeneration plants with electric capacity of up to 4 MW which ensure at least 30 % of generation of electricity with by-products of animal origin or their derivatives, and which ensure at least 70 % of raw materials by themselves or acquire them from a producer which owns more than 50 % of the taxpayer fixed capital, moreover, the thermal energy generated is used in generating its own produce; high efficiency wood biomass cogeneration plants with electric capacity of up to 4 MW that use at least 70 % of the thermal energy obtained in cogeneration process for generating their own produce; high efficiency natural gas cogeneration plants with electric capacity of up to 4 MW or without a restriction on the installed electric capacity in RES cogeneration plants that use at least 70 % of the thermal energy generated for ensuring the vegetation process of plants in covered areas the total area of which is not less than 5000 m².

³² Informative Report On the Situation in the Biofuel Production Sector (TA-1804) (23 April 2013, prot. No. 23, par. 31). Available at: <http://www.mk.gov.lv/lv/mk/tap/?pid=40248005>;

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- ³³ Directive 2010/31/EU of the European Parliament and of the Council on the energy performance of buildings;
- ³⁴ Directive 2010/30/EU of the European Parliament and of the Council on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products;
- ³⁵ Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products;
- ³⁶ Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC;
- ³⁷ EK notification - COM (2014) 520 final;
- ³⁸ The different alternative options for deployment are analysed in the following documents adopted by the Cabinet: 1) in the Concept on Taking over the Requirements of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC in Laws and Regulations (Cabinet Order No. 587 of 2 December 2013); 2) in the Report on Carrying out the Requirements of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC; 3) in the Informative Report on Moving Towards the Indicative State Energy Efficiency Target in Accordance with Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC;
- ³⁹ The general objective is to review and determine the minimum energy efficiency requirements for goods and services, as well as to review and determine the requirements for the labelling of goods;
- ⁴⁰ The legal acts of ecodesign and energy labelling in force in 2015 encompass such products as household lighting products (including incandescent bulbs), television sets, air conditioners, washing machines, etc. In total 28 legal acts in the field of ecodesign and 16 legal acts in the field of energy labelling have come into force;
- ⁴¹ Final technical report: Evaluation of the Energy Labelling Directive and Specific Aspects of the Ecodesign Directive (ENER/C3/2012-523), Ecofys, 2014;
- ⁴² Approximately 10–25 % of goods/products might be non-conforming which represents 10 % of lost potential energy savings and losses in the amount of approximately 14 bill. euros per year;
- ⁴³ Among other things process of reviewing the Energy Labelling Directive is taking place in 2015 (see the proposal developed by the European Commission for Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU (COM(2015) 341 final)). Proposal for regulation, *inter alia*, lays down stricter obligations of market supervision and consumer information for Member States;
- ⁴⁴ Information provided by *Latvijas Gāze AS*, For the Evaluation of the Energy Efficiency Potential of the Gas and Electricity Infrastructure in the Republic of Latvia, which was submitted to the European Commission on 7 July of this year.
- ⁴⁵ Statistical summaries on energy efficiency of buildings – https://www.em.gov.lv/lv/nozares_politika/majokli/petijumi__statistika/;
- ⁴⁶ The evaluation is available on the website of the Ministry of Economics in section EU Funds, sub-section Approved Measures 2014–2020. https://www.em.gov.lv/lv/es_fondi/apstiprinatie_normativie_akti_2014__2020/;
- ⁴⁷ Buildings in the ownership, possession, and use of State institutions with the total area above 250 m² as on 9 July 2015 in accordance with Article 5(5) of Directive 2010/27/EU of the European Parliament and of the Council (prepared according to the information provided by State institutions). https://www.em.gov.lv/lv/nozares_politika/majokli/eku_energoefektivitate/no_direktivas_2012_27_es_par_energoefektivitati_izrietasas_prasibas/;
- ⁴⁸ https://www.em.gov.lv/lv/nozares_politika/energoefektivitate_un_siltumapgade/energoefektivitate/noderigas_saites/;
- ⁴⁹ Concept on Taking over the Requirements of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC in Laws and Regulations (Cabinet Order No. 587 of 2 December 2013). Several alternatives for achieving the target have been evaluated in the concept in accordance with the laws and regulations regarding planning of development, including based on the impact of each solution on the State and local government budget, indicating the financing available and additionally necessary, as well as including the possible saving of resources.
- ⁵⁰ The provisional necessary financial resources will be known after submission of the project for financing.
- ⁵¹ In accordance with the Energy Law, derogation until 2017.
- ⁵² provided that the deployment of the Third Energy Package of the EU is ensured.
- ⁵³ The partnership contract in the 2014–2020 planning period of EU funds mentions that the measures planned within the framework of the Cohesion Policy funds are to be reviewed in 2016 if financing is not granted to the aforementioned projects within the framework of CEF. Upon reviewing the partnership contract in 2016, the

information regarding the projects, its implementation schedule, and sources of financing must be updated. The project is included in the second list of PCI and may apply for funds from CEF until 2020.

⁵⁴ it has been approved with the Cabinet Order No. 129 of 26 March 2014.

⁵⁵ Sustainable Energy Action Plan of Riga City for a Smart City for 2014–2020.

⁵⁶ In accordance with the requirements of Article 3 of Council Directive 2009/119/EC of 14 September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or oil products, the Member States shall continuously maintain an amount of oil stocks within the Community territory that corresponds to 90 days of average daily net imports or 61 days of average daily inland consumption, whichever of the two quantities is greater.

⁵⁷ The provisional revenue from the State fee in accordance with Cabinet Regulation No. 450 of 14 June 2011, Regulations Regarding the Amount of the State oil Product Stocks, the Amount of the State Fee to be Paid for the Maintenance of Emergency Stocks, and the Procedures for the Calculation, Payment and Administration Thereof.

Minister for Economics

Dana Reizniece-Ozola

Summary of the Energy Development Guidelines for 2016–2020

The Energy Development Guidelines for 2016–2020 (hereinafter – the Guidelines) lay down the core principles, targets, and action directions of the energy policy of Latvia for the period of four years, ensuring a link to the targets laid down in the informative report “Long-term Energy Strategy of Latvia 2030 – Competitive Energy for Society”, and also outline the long-term development trends of the sector in all fields of energy.

The Guidelines lay down the action directions by taking into account the following targets of the climate and energy policy which were brought forward in the European Council¹ of 8/9 March 2007 and which the European Union must achieve by 2020:

- to reduce the GHG emissions by 20 % compared to 1990 level;
- to increase the share of renewable energies in energy consumption up to 20 %;
- to increase energy efficiency by 20 %.

The main objective of the energy policy of Latvia is to increase the competitiveness of national economy together with the implementation of other sectoral policies by promoting the safety of supply, formation of energy resources and energy prices specified by the free market and competition, sustainable generation and consumption of energy with two targets of the energy policy:

- sustainable energy: planned activities for increasing the proportion of “green energy”, reduction of GHG emissions, and more efficient use of the consumed energy. In order to increase the share of renewable energy in the final energy consumption, the planned activities are directed towards the well-ordering and further development of the aid mechanism, ensuring its operation according to the market principles. The legal framework will be brought to line in the field of energy efficiency so that Latvia could achieve the energy savings targets assigned to it, continue the commenced thermal insulation programmes for multiapartment buildings, and commence repairs of the State and local government buildings. In addition it is planned to develop a more efficient heating supply market and zero emissions transport;

- in the field of improving the safety of energy supply it is intended to implement measures which are directed towards a stable energy supply available to the consumers of energy by reducing geopolitical risks, diversifying the sources and routes of supply of energy resources, developing interconnections and the infrastructure of the national internal energy supply, introducing smart technologies in energy supply networks, forming reserves of energy resources, and participating in the improvement of legal framework. Long term optimisation of the costs of the safety of energy supply also requires regional cooperation, facilitating further integration in the European Union and networks of the Scandinavian countries, achieving levelling of prices in the region, as well as diversification of energy supplies, solving issues of both the electricity and gas infrastructure at the level of the European Union within the framework of the internal energy market.

In overall the Guidelines cover nine areas: development of the internal energy market, energy infrastructure, infrastructure for the charging/filling of transport, electricity supply, heating supply, energy efficiency, management of crisis situations, innovations, and renewable energy. Several action directions are offered in each of them. The situation in the energy sector is extensively analysed in the draft Guidelines, an insight into the current processes of the

¹ Conclusions of the European Council of 8/9 March 2007 – https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/93135.pdf

European Union and international processes which are of importance to all sectors for planning further development is provided.

The following core directions are provided for in the Guidelines for the achievement of the laid-down targets:

- diversification of primary energy resources by promoting the exploration and extraction of local primary energy resources in Latvia and diversification of the supply routes and sources of energy resources, particularly developing interconnections of natural gas which will have a positive impact on the energy market of Latvia;
- establishment of an efficient energy market by liberalising the energy market, including by separating the services of the natural gas distribution system and trading from the natural gas transmission and storage system services;
- efficient energy infrastructure by improving the infrastructure of the transmission system, including by constructing cross-border connections, improving the safety of the distribution system, and improving the natural gas storage system;
- efficient thermal energy market;
- increase in the share of renewable energy sources by implementing measures to increase the share of the RES in gross final energy consumption and final consumption in transport;
- improved energy efficiency upon introducing the Energy Efficiency Directive and implementing energy efficiency measures in the State sector, sector of multiapartment buildings and industry;
- efficient crisis situation management;
- strengthening of international and regional cooperation;
- provision of information to the public regarding developments in the energy sector;
- innovative solutions for problems in the energy sector.

Financing from the State or local government budget, European Union funds, Connecting Europe Facility, as well as resources of capital companies is provided for the implementation of the measures included in the Guidelines until 2020.

Public and sectoral representatives participated in the development process of the Guidelines. On 23 October 2014 the draft Guidelines were handed over for public discussion by posting them on the website of the Ministry of Economics. Meetings for discussing the draft Guidelines were organised at the Ministry of Economics and the Energy Sub-committee of the National Economy Council for additional discussions. All proposals submitted by sectoral representatives were evaluated, the draft Guidelines were updated, and the updated versions thereof were posted on the website of the Ministry of Economics.

In addition the Strategic Environmental Impact Assessment on the Energy Development Guidelines for 2015–2020 was developed and handed over for public discussion. On 28 October 2015 it was submitted to the State Environmental Monitoring Bureau, and a positive statement was received thereon.

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