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NATIONAL ENERGY AND CLIMATE PLAN OF LATVIA 2021–2030

DRAFT

FOR SUBMITTING TO THE EUROPEAN COMMISSION FOR EVALUATION

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ACRONYMS

AFDP2020	Alternative Fuels Development Plan 2017–2020
RE	Renewable energy
RES	Renewable energy sources
UN	United Nations
BEMIP	Baltic Energy Market Interconnection Plan
CO_2	Carbon dioxide
DH	District heating, which, according to the Energy Law, is a set of heating sources, heating transmission and distribution networks, and users of thermal energy that generate, convert, transmit, distribute, and consume thermal energy in a coordinated way
CSB	Central Statistical Bureau
EDG2020	Energy Development Guidelines 2016–2020
EC	European Commission
EAAI	Emission Allowances Auctioning Instrument
EAFRD	European Agricultural Fund for Rural Development
MoE	Ministry of Economics
EnU	Energy Union
PAEEPM2020	Plan for Alternative Energy Efficiency Policy Measures for Reaching the Final Energy Consumption Savings Target for 2014–2020
EEOS	Energy Efficiency Obligation Scheme
ERDF	European Regional Development Fund
EU	European Union
ESCO	Energy service company
EV	Electric vehicle
ETS	European Union Emissions Trading System
EUROSTAT	Statistical Office of the European Union
EEA	European Environment Agency
LTRS	Long-term renovation strategy
MoF	Ministry of Finance
F-gases	Fluorinated greenhouse gases
HPP	Hydroelectric power plant
MoI	Ministry of the Interior
GDP	Gross Domestic Product
MoES	Ministry of Education and Science
CIPEE	Conception on Incorporating the Provisions 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 into National Law
CEP2020	European Council Presidency Conclusions of 2 May 2007
CEPF2030	European Council Conclusions on 2030 Climate and Energy Policy Framework of 24 October 2014
CF	Cohesion Fund
PCI	Project of Common Interest
CCFI	Climate Change Financial Instrument
RDP2020	Rural Development Programme 2014–2020
LTESL2030	Long-Term Energy Strategy of Latvia 2030 — Competitive Energy for the Society

SDSL2030	Sustainable Development Strategy of Latvia 2030
LIFE	Programme for the Environment and Climate Action
LLU	Latvia University of Life Sciences and Technologies
NDPL2020	National Development Plan of Latvia 2014–2020
NRPL2020	National Reform Programme of Latvia for the Implementation of the EU 2020 Strategy
LALRG	Latvian Association of Local and Regional Governments
REAPRL	Action Plan of the Republic of Latvia in the Field of Renewable Energy for Implementing the 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 sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC by 2020
LH	Local heating, which, according to the Energy Law, is a heat supply system in the ownership of an autonomous producer, the state, or local government institutions, which provides thermal energy for personal needs and for other consumers of energy, whom the thermal energy is distributed and supplied from the heating source with or without the distribution pipeline system
UL	University of Latvia
LEGMC	Latvian Environmental, Geological and Meteorological Centre (State limited liability company)
LNIFR Silava	Silava Latvian National Institute for Forestry Research
SSSL	Smart Specialisation Strategy of Latvia
MFF2027	Multiannual Financial Framework for 2021–2027
CM	Cabinet of Ministers
GDFRS2020	Guidelines for the Development of Forestry and Related Sectors 2015–2020
NIPG2020	National Industrial Policy Guidelines 2014–2020
NGO	Non-governmental organisation
NISRA	National Information System of Research Activity
LCD	Low carbon development
R&D	Research and development
CSCC	Cross-Sectoral Coordination Centre
GHG	Greenhouse gases
MPC	Mandatory procurement component
LCDS2050	Low Carbon Development Strategy of Latvia 2050
MoT	Ministry of Transport
PUC	Public Utilities Commission
tbc	To be confirmed or updated in the final version of the Plan
TDG2020	Transport Development Guidelines 2014–2020
MoEPRD	Ministry of Environmental Protection and Regional Development
WPP	Wind power plant
NRP	National research programme
EPG2020	Environmental Policy Guidelines 2014–2020
LULUCF	Land use, land-use change and forestry
MoA	Ministry of Agriculture
GPP	Green public procurement
STI	Science, technology and innovation
GDSTI2020	Guidelines for the Development of Science, Technology and Innovation 2014–2020

1. OVERVIEW AND PROCESS FOR ESTABLISHING THE PLAN

1.1. Executive summary

1.1.1. Political, economic, environmental, and social context of the Plan

The National Energy and Climate Plan 2021–2030 (hereinafter — the Plan) is a document for long-term policy planning developed according to Cabinet Order No. 275 of 3 May 2016 "On the Government Action Plan for Implementing the Declaration of the Intended Activities of the Cabinet of Ministers Headed by Māris Kučinskis"[1] (task number in the declaration: 013, measure number: 13.2).

At the EU level, the development of the Plan, its content, national targets, objectives and contributions for reaching the EU objectives, information and data, as well as performance indicators to be included in the Plan are governed by:

- CEPF2030[2];
- Conclusions of the Transport, Telecommunications and Energy Council of 26 November 2015 on the Governance System of the Energy Union[3];
- Proposal for a Regulation of the European Parliament and of the Council on the Governance of the Energy Union, amending Directive 94/22/EC, Directive 98/70/EC, Directive 2009/31/EC, Regulation (EC) No 663/2009, Regulation (EC) No 715/2009, Directive 2009/73/EC, Council Directive 2009/119/EC, Directive 2010/31/EU, Directive 2012/27/EU, Directive 2013/30/EU and Council Directive (EU) 2015/652 and repealing Regulation (EU) No 525/2013[4] (hereinafter — Proposal for the Regulation on the Governance of the EnU)[5].

The Plan is developed in every Member State, including Latvia, to meet the objectives set by the EU or international commitments made:

- commitments for 2030 made within the Paris Agreement under the UN Framework Convention on Climate Change (hereinafter — the Convention) regarding climate change mitigation — reduction of GHG emissions and greater CO_2 sequestration in all sectors — to reduce the total EU GHG emissions by at least 40 % compared to 1990 by 2030 in a cost effective way;
- the EU Roadmap for Moving to a Competitive Low Carbon Economy in 2050[6] — the EU is committed to achieving an internal reduction of EU Member State emissions by 80–95% by 2050 compared to 1990 levels in order to be a competitive economy with low carbon dioxide emissions;
- A Clean Planet for all — A European Strategic Long Term Vision for a Prosperous, Modern, Competitive and Climate Neutral Economy[7] — the EU is committed to achieving greenhouse gas emissions neutrality by 2050 according to a net-zero GHG emissions principle where the total amount of GHG emissions generated is compensated by removing the CO_2 generated or the use of specific technologies prevents the escape of GHG emissions.

[1] https://likumi.lv/ta/id/281943-par-valdibas-ricibas-planu-deklaracijas-par-mara-kucinska-vadita-ministru-kabineta-iecereto-darbibu-istenosanai
[2] http://data.consilium.europa.eu/doc/document/ST-169-2014-INIT/lv/pdf
[3] http://data.consilium.europa.eu/doc/document/ST-14459-2015-INIT/lv/pdf
[4] http://data.consilium.europa.eu/doc/document/PE-55-2018-INIT/lv/pdf
[5] Entered into force at the end of December 2018
[6] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:52011DC0112&from=LV
[7] https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf

- CEPF2030.

The Plan is a policy planning document to be implemented in the long-term by primarily complying with economic development, energy and climate targets. A number of predictable factors (the cyclical nature of economy) and unpredictable factors, as well as geopolitical development scenarios (political changes and unpredictable global situation) have to be taken into consideration in the development of the Plan.

The Plan includes the assessment of the economic impact of measures laid down for reaching its objectives, such as necessary investments, potential benefits, and cost effectiveness, which will allow to measure the overall impact of the Plan on the national economy of Latvia (impact on gross domestic product) and thus the socio-economic impact on the society. Common sectoral needs and measurements, which will be implemented with the help of EU funds, will result from the National Development Plan 2021–2027 pursuant to Section 11, Paragraph 3^1 of the Development Planning System Law[8]. The National Development Plan is a long-term planning document, the main medium term development planning document in Latvia. The content to be included in development planning documents governing the EU policy instruments and foreign financial aid will be primarily based on the National Development Plan. However, it should be noted that drafting of the National Development Plan 2021–2027 will start only in the spring of 2019 and its final approval is expected to take place at the end of 2019 or in 2020 when the final version of the Plan has to be approved in Latvia and submitted to the EC.

The measures included in the Plan will also be assessed with regard to their impact on the environment and society, although it is clear at the moment of submitting the draft Plan to the EC that reaching the objectives laid down in the Plan will have a sufficient impact on the society (both positive and negative) with positive impact on the improvement of the social environment and negative impact on societal (household) costs. Nonetheless, the society of Latvia is likely to be willing to invest more into a sustainable development of the country.

Once the Plan is developed in full according to the schedule, which was approved by § 50 Informative Report "On the Development of the National Energy and Climate Plan" of the Minutes of the Cabinet Meeting No. 30 of 26 June 2018, a strategic environmental impact assessment will be developed in accordance with the Law On Environmental Impact Assessment and Cabinet Regulation No. 157 of 23 March 2004 "Procedures for Carrying Out a Strategic Environmental Impact Assessment" in order to assess the environmental impact of the Plan as a policy planning document.

The Plan was drawn up by taking note of the available and emerging technologies, development trends and plans of various economic sectors, and energy and GHG emission projections based on the latest data with 2016 as a reference year.

Since the development of the Plan is governed by an EU document, Proposal for the Regulation on the Governance of the EnU, this policy planning document was drafted according to Section 6 of the Cabinet Regulation No. 737 of 2 December 2014 "Rules on the Drawing Up and Impact Assessment of Development Planning Documents" by complying with the requirements specified in this Cabinet Regulation to the extent possible regarding the specific type of a policy planning document — a plan.

According to the Proposal for the Regulation on the Governance of the EnU, the draft Plan is submitted to the EC for initial assessment. The final version of the Plan will be approved according to the legislation of the Republic of Latvia and submitted to the EC by

[8] https://likumi.lv/doc.php?id=175748

31 December 2019 according to the requirements of the Proposal for the Regulation on the Governance of the EnU.

1.1.2. Strategy with regard to all dimensions of the EnU and the main objectives of the Plan

The Plan was developed according to SDSL2030[9] and LTESL2030[10], and its main strategy and objective is as follows:

To ensure transition to low carbon economy that is competitive in the region and worldwide by developing a balanced and effective energy policy based on market principles, which promotes further development of the Latvian economy and welfare of the society.

The measures and principles set out in the Plan are based o full introduction and implementation of the polluter pays principle provided for in the TFEU.

The Plan covers objectives of all the dimensions of the EnU, as well as policies and measures required to reach them. Discussions on the EU funds available for the EU Member States continue, including on the contributions from the CF for the 2021–2027 programming period and the scope of support. The distribution of the cohesion policy funding for the 2021–2027 programming period in Latvia will be based on the National Development Plan of Latvia for 2021–2027. The source of funding for support programmes seeking to leverage funding from the cohesion policy indicated in the Plan is therefore indicative.

Table 1. Policy outcomes and performance indicators of the dimensions of the EnU in EU and Latvia

Policy outcome in each dimension of the Plan	EU		Latvia			
	Target value		Actual value		Target value	
	2020	2030	2016	2017[11]	2020	2030
1.1. GHG emission reduction target (% compared to 1990)	**-20**[12]	**-40**[13]	**-57**	**-57**	**-**	**-55**[14]
1.1.1. Non-ETS activities (% compared to 2005)	**-10**[15]	**-30**[16]	**+6**	**+7**	**+17**[17]	**-6**[18]
1.1.2. ETS activities (% compared to 2005)	**-21**[19]	**-43**[20]	**-23**	**-28**	**-21**[21]	**-**
1.1.3. LULUCF accounting categories (million t)	**-**	**0**	**-**	**-**	**0**	**-3.1**[22]
1.2. Share of energy produced from RES in gross final energy consumption (%)	**20**[23]	**32**[24]	**37.2**	*tbc*	**40**[25]	**45**
1.3. Share of energy produced from	**10**[26]	**14**[27]	**2.8**	*tbc*	**10**[28]	**14**[29]

[9] http://polsis.mk.gov.lv/documents/3323
[10] http://polsis.mk.gov.lv/documents/4849
[11] Approximate value, to be confirmed in the final version of the Plan in 2019 according to the official statistical data of Latvia
[12] CEP2020
[13] CEPF2030
[14] SDSL2030
[15] EC Communication *20 20 by 2020 — Europe's climate change opportunity* of 23 January 2008
[16] CEPF2030
[17] Decision No 406/2009/EC
[18] Regulation (EU) 2018/842
[19] EC Communication *20 20 by 2020 — Europe's climate change opportunity* of 23 January 2008
[20] CEPF2030
[21] EPG2020
[22] Regulation (EU) 2018/842
[23] CEP2020
[24] Proposal for amending Directive 2009/28/EC
[25] Directive 2009/28/EC, EDG2020

Policy outcome in each dimension of the Plan	EU		Latvia			
	Target value		Actual value		Target value	
	2020	2030	2016	2017[11]	2020	2030
RES in gross final energy consumption in transport (%)						
1.4. Share of advanced biofuels in gross final energy consumption in transport (%)	-	**3.5**[30]	**0**	**0**	-	**3.5**[31]
1.5. Share of energy produced from RES in gross final energy consumption in electricity production (%)	-	-	**52**	*tbc*	**53.4**	-
1.6. Share of energy produced from RES in gross final energy consumption in heating and cooling (%)	-	-	**51**	*tbc*	**59.8**	-
2. Increase in energy efficiency (%)	**20**[32]	**32.5**[33]	-	-	-	-
2.1. Optional target — primary energy consumption (Mtoe)	**1,474**[34]	**1,273**[35]	**4.32**	**4.56**	**5.4**[36]	**4.33**
2.2. Optional target — final energy consumption (Mtoe)	**1078**[37]	**956**[38]	**3.92**	**4.11**	**4.47**[39]	**3.57**
2.3. Mandatory national target — cumulated final energy savings (Mtoe)	-	-	**0.18**	*tbc*	**0.85**[40]	***1.7***[41]
2.4. Building renovation target (total renovated m^2)	-	-	**232,635**	**368,794**	**678,460**[42]	***tbc***
2.5. Specific heat consumption in buildings (kWh/m^2/year)	-	-	*tbc*	*tbc*	**150**[43]	**100**[44]
3.1. Share of imports in gross national energy consumption (incl. bunkering) (%)	-	-	**47.2**	*tbc*	**44.1**[45]	**30**[46]
4.1. Interconnection capacity (% of total generation capacity)	**10**[47]	**15**[48]	-	**80**	**10**[49]	**15**[50]
4.2. Options to purchase natural gas from various sources (*number of*	**1**	**1**	**1**	**>2**	**≥1**[51]	**>1**

[26] CEP2020
[27] Proposal for amending Directive 2009/28/EC
[28] Directive 2009/28/EC, EDG2020
[29] Proposal for amending Directive 2009/28/EC
[30] Proposal for amending Directive 2009/28/EC
[31] Proposal for amending Directive 2009/28/EC
[32] CEP2020
[33] Proposal for amending Directive 2012/27/EU
[34] Directive 2012/27/EU
[35] Proposal for amending Directive 2012/27/EU
[36] Indicative primary energy consumption
[37] Directive 2012/27/EU
[38] Proposal for amending Directive 2012/27/EU
[39] Indicative final energy consumption
[40] EDG2020
[41] Indicative value. The target will be set at the end of 2019 when the official statistical data about the final energy consumption in Latvia in 2018 are available
[42] EDG2020
[43] EDG2020
[44] Indicative and optional target, LTESL2030
[45] EDG2020
[46] LTESL2030 (indicative target)
[47] CEPF2030, EDG2020
[48] CEPF2030
[49] CEPF2030, EDG2020
[50] CEPF2030, EDG2020
[51] EDG2020

Policy outcome in each dimension of the Plan	EU		Latvia			
	Target value		Actual value		Target value	
	2020	2030	2016	2017[11]	2020	2030
sources)						
5.1. Turnover of innovative products (% of total turnover)	-	-	*tbc*	*tbc*	-	**>14**[52]
5.2. Share of innovative enterprises (% of all enterprises)	-	-	*tbc*	*tbc*	-	**>40**[53]
5.3. Share of high technology sector exports (% of total annual exports)	-	-	*tbc*	*tbc*	-	**>15**[54]

1.2. Overview of the current policy situation

1.2.1. Context of the policy of the National Plan and the energy system of Latvia and EU

1.2.1.1. Context of the policy of the National Plan

At the EU level, the energy policy for 2050 is defined in the EC Communication A EU Roadmap for Moving to a Competitive Low Carbon Economy in 2050 [55], with the following policy goals in the energy sector by 2050:

- a secure, competitive and fully decarbonised power sector;
- sustainable mobility through fuel efficiency, electrification and getting prices right;
- the built environment for improving the energy performance of buildings;
- reduction of GHG emissions in the industrial sectors, including energy intensive industries through application of more advanced resources and energy efficient industrial processes and equipment, increased recycling, as well as GHG emission reduction technologies;
- raising land use productivity sustainably.

The energy policy for 2030 in its turn is defined in the EC Communication *Clean Energy For All Europeans*[56] with the tabled package of documents aiming to pursue three main goals:

- putting energy efficiency first;
- achieving global leadership in renewable energies;
- providing a fair deal for consumers.

With regard to planning the development of Latvia the Plan is subordinated to SDSL2030.

1.2.1.2. Context of the energy system of Latvia and EU

Energy is one of the sectors that contributes directly to the economic growth of the country and forms a significant part of the total costs in some industries, especially manufacturing industry. The most important factor for industry growth has been and will continue to be the lowest possible sustainable energy price,which includes security and quality. Development of the energy sector requires significant investments, the attraction of which calls for a stable and predictable investment environment.

The total primary energy consumption in Latvia in 2016 was 184.5 PJ, which was only 0.3 % more than in 2015, while in 2017 it was 194.9 PJ, which was a 5.5 % increase compared to

[52] SDSL2030
[53] SDSL2030
[54] SDSL2030
[55] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:52011DC0112&from=LV
[56] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1485341914564&uri=CELEX:52016DC0860%2801%29

2016[57]. The total primary energy consumption has not changed significantly during the last five years from 2013 to 2017, while the share of RES has increased by 2.55 %.

Unlike in the EU, there has been a significant decrease in both total primary energy consumption and final energy consumption in Latvia during the period from 1990 to 2000 and also during the period since 2011, whereas the EU has seen a significant increase in energy consumption since 2014 — sharper than in Latvia.

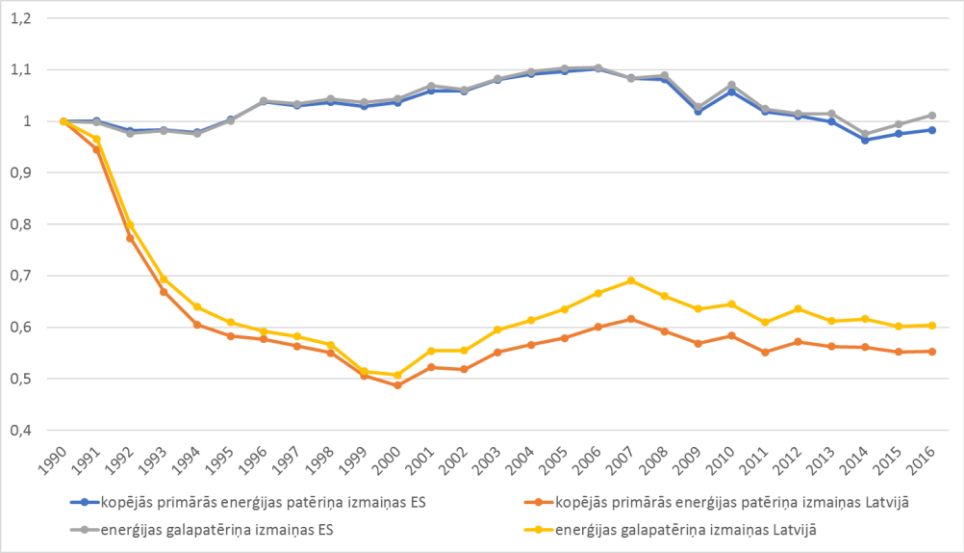


Figure 1. Total primary energy consumption and final energy consumption changes in EU and Latvia from 1990 to 2016 (1990 = 1)[58]

There have been some changes in the structure of primary energy consumption in recent years: as the consumption of natural gas decreases, the share of RES in the total primary energy consumption increases, with the share of the consumption of natural gas decreasing by 4,2 % in ten years, reaching 25.4 % in 2016 and 23.4 % in 2017. RES used in Latvia are local energy sources. Therefore, as the total consumption of RES increases, Latvia's energy dependency[59] from imported energy has decreased from 63.9 % in 2005 to 47.2 % in 2016.

[57] CSB
[58] Data source: EUROSTAT
[59] Energy dependency is an indicator that is calculated by subtracting energy exports from imports, dividing the result by the total energy consumption, and adding bunkering.

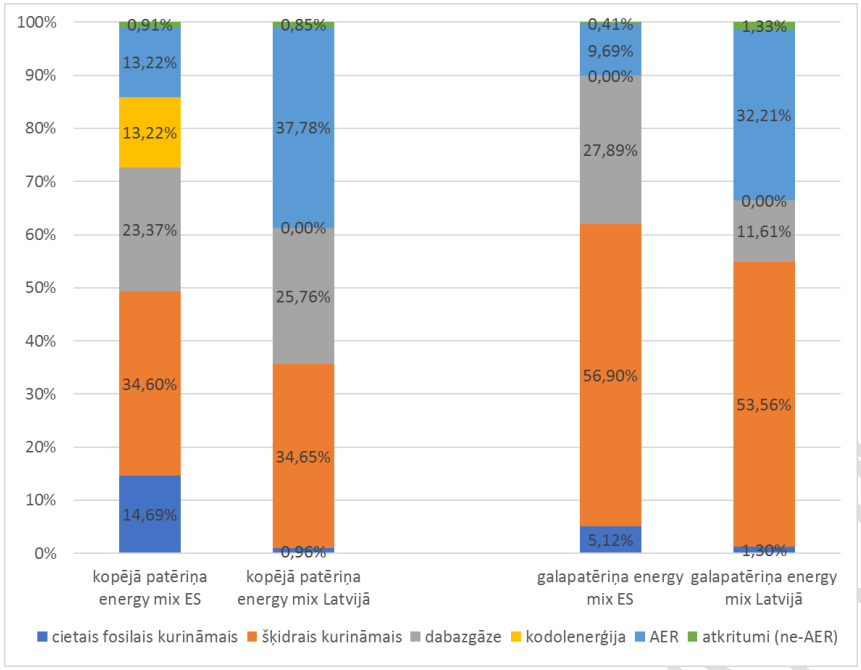


Figure 2. Total primary energy consumption and final energy consumption in Latvia and EU in 2016 (%)[60]

Compared to 2015, the final energy consumption in 2016 remained stable at 163.6 PJ, which was 0.1 % more than in the previous year. There were no significant changes in the final energy consumption from 2006 to 2016, while in 2016–2017 the final energy consumption increased by about 6 %. The largest energy consumer in 2016 and 2017 was the transport sector with 30.4 % and 30 % respectively, followed by households with 29 % and 29.2 % and industry with 20.8 % and 21 %. Compared to 2016, increase in the final energy consumption in 2017 was observed in all sectors with the sharpest growth of 11.9 % in agriculture and forestry.

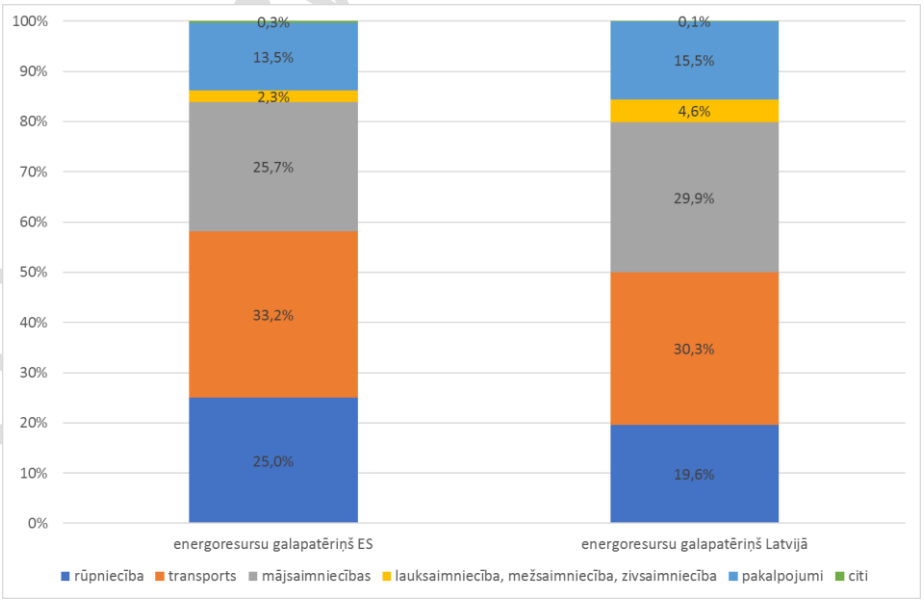


Figure 3. Final energy consumption by sector in Latvia and EU in 2016 (%)[61]

[60] Data source: EUROSTAT
[61] EUROSTAT

1.2.2. Current energy and climate policies and measures concerning the dimensions of the EnU

1.2.2.1. EU policies concerning the dimensions of the EnU

The context of the Plan at the EU level results from the conclusions of the European Council, CEP2020 and CEPF2030, as well as several EC communications:

- Communication of 19 October 2006 *Action Plan for Energy Efficiency: Realising the Potential*;
- Communication *Renewable Energy Road Map. Renewable energies in the 21st century: building a more sustainable future* of 10 January 2007;
- Communication *20 20 by 2020 — Europe's climate change opportunity* of 23 January 2008;
- Communication *A EU Roadmap for Moving to a Competitive Low Carbon Economy in 2050* of 8 March 2011;
- Communication *Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system* of 28 March 2011;
- Communication *A policy framework for climate and energy in the period from 2020 to 2030* of 22 January 2014;
- Communication *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy* of 25 February 2015;
- Communication *Clean Energy For All Europeans* of 30 November 2016;
- Communication *An agenda for a socially fair transition towards clean, competitive and connected mobility for all* of 31 March 2017;
- Communication *Delivering on low-emission mobility. A European Union that protects the planet, empowers its consumers and defends its industry and workers* of 8 November 2017;
- Communication *Sustainable Mobility for Europe: safe, connected, and clean* of 17 May 2018.

Development of the Plan and the context of policies and measures included in it is also governed by a number of EU instruments, the most important of them being the following:

- Proposal for the Regulation on the Governance of the EnU;
- Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (hereinafter — Directive 2003/87/EC);
- 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 (hereinafter — Decision No 406/2009/EC);
- Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (hereinafter — Regulation 2018/842);

- Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (hereinafter — Regulation 2018/841);
- 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 sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (hereinafter — Directive 2009/28/EC);
- Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast)[62] (hereinafter — Proposal for amending Directive 2009/28/EC);
- 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 (hereinafter — Directive 2012/27/EU);
- Proposal for a Directive of the European Parliament and of the Council amending Directive 2012/27/EU on energy efficiency[63] (hereinafter — Proposal for amending Directive 2012/27/EU);
- Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast) (hereinafter — Directive 2010/31/EU).

1.2.2.2. Latvia's policies concerning the dimensions of the EnU

There are currently a number of policy planning documents (including informative reports) in force in Latvia related to the development of the energy sector and climate change mitigation issues with objectives concerning the energy sector and climate change mitigation, as well as policies for reaching these targets.

1) SDSL2030 lays down the following objectives in the context of the Plan:

- to ensure energy independence of the country by increasing self-sufficiency of energy and integrating in the EU energy networks;
- to be the EU leader in the preservation, increase, and sustainable use of natural capital;
- to preserve the originality of Latvia — the diverse natural and cultural heritage, typical and unique landscapes.

SDSL2030 includes targets for GHG emission reduction, the share of RES and energy intensity, as well as innovation goals for 2030.

2) NDPL2020 lays down the following objectives in the context of the Plan:

- to ensure sustainable use of the energy resources required by the national economy by promoting the availability of a market for the resources, decrease of sectoral energy intensity and emission intensity, and increase of the proportion of renewable energy in the total consumption, while focusing on competitive energy prices;
- to maintain the natural capital as the basis for sustainable economic growth and promote its sustainable use while minimising natural and human risks to the quality of the environment.

[62] http://data.consilium.europa.eu/doc/document/PE-48-2018-INIT/lv/pdf
[63] http://data.consilium.europa.eu/doc/document/PE-54-2018-INIT/lv/pdf

NDPL2020 includes targets for the national GHG emission intensity, the share of RES, energy consumption, and energy independence, as well as agricultural, forestry, and waste management goals for 2020.

3) LTESL2030 lays down the following objective in the context of the Plan:

- competitive economy with a sustainable energy sector and increased security of energy supply.

LTESL2030 includes optional and non-binding targets for the use of RES, energy and energy sources, and the share of imports for 2030.

4) EDG2020 lay down the following objective in the context of the Plan:

- to increase the competitiveness of the national economy by promoting the security of supply, pricing of energy sources and energy on the basis of the free market and competition, and sustainable energy production and consumption.

EDG2030 include targets for the use of RES, increase in energy efficiency, energy consumption and savings for 2020, as well as interconnection and energy independence targets for 2030.

5) EPG2020[64] lay down the following objectives in the context of the Plan:

- to make sure Latvia contributes towards mitigating global climate change, taking into account its environmental, social, and economic interests;
- to help Latvia prepare to adapt to climate change and its effects.

EPG2020 include targets for GHG emission reduction for 2020.

Annex 1 of the Plan includes detailed information about the connection of the Plan with policy planning documents of Latvia (including informative reports) and provides detailed information about their objectives in the context of the policies of the Plan and the main measures for reaching these objectives.

1.2.3. Key issues of cross-border relevance

The key measures implemented in the context of the Plan are related to the interconnections of the Baltic energy market and energy security.

In the cross-border context it is also important that the Baltic States coordinate the measures that influence not only the compatibility of infrastructure and electricity, but also the flow of energy sources (fossil energy sources, as well as biomass and biofuels) between the Baltic States.

In the context of decarbonisation it is extremely important to establish and maintain a common (harmonised) view on decarbonisation options in the Baltic States and a common approach to implementing decarbonisation measures. However, using a common approach to the implementation of decarbonisation measures might be difficult due to the different situation in the Member States, especially regarding the energy structure and the main sources of GHG emissions: Latvia has the highest share of GHG emissions from non-ETS activities among the Baltic States (second highest among the EU Member States) with agriculture and transport dominating in the area of GHG emissions from non-ETS activities, while Estonia is among the top EU Member States with the lowest share of GHG emissions from non-ETS activities and the highest emissions from transport. The share of Lithuania's GHG emissions from non-ETS activities and their structure with the largest contribution from transport and agriculture is more similar to Latvia than Estonia. Nevertheless, transport is one of the major

[64] http://polsis.mk.gov.lv/documents/4711

sources of GHG emissions from non-ETS activities in all three Baltic States. Coordinated activities should therefore be implemented to reduce emissions particularly from the transport sector.

1.2.4. Administrative structure of implementing national energy and climate policies

Responsibilities of sectoral ministries are laid down in ministry statutes[65], which are approved by the Cabinet of Ministers (as Cabinet regulations).

Development of the policy for the use of RES, promotion of energy efficiency, as well as energy security and internal energy market is the responsibility of MoE. The policy for ensuring the reduction of GHG emissions, including CO_2, is developed by MoEPRD. The authority responsible for education and science is MoES, while MoE and MoEPRD are responsible for matters related to innovation and competitiveness.

1.3. Consultations and involvement of national and EU bodies and their outcome

1.3.1. Involvement of the Saeima and Cabinet of Ministers of the Republic of Latvia

On 26 June 2018, the Cabinet of Ministers approved the informative report "On the Development of the National Energy and Climate Plan" and the protocol decision of the meeting of the Cabinet "Informative Report "On the Development of the National Energy and Climate Plan"" (§ 50 of the Minutes No. 30 of the Cabinet of Ministers of 26 June 2018), which laid down the content of the Plan and the time frame, as well as the principles of the development of the Plan and responsibilities for preparing the information.

According to the informative report, the involvement of the Cabinet of Ministers is required before submitting the draft Project to the EC, i.e. December 2018.

1.3.2. Involvement of local and regional authorities

On 23 August 2018, the Ministry of Economics presented the topical issues regarding the development of the Plan within the project *Putting Regions on Track for Carbon Neutrality by 2050* (C-TRACK-50) implemented by Riga Planning Region. The purpose of the project is to mobilise and support national regulatory authorities by reviewing and developing energy policy priorities for low carbon development by 2050, as well as to promote cross-sectoral cooperation and encourage local governments to find funding and develop and implement energy and climate plans in order to reach the goal of becoming carbon neutral by 2050. Participants of the meeting were informed about the content of the Plan, its development and implementation responsibilities, targets to be included in the Plan, as well as the contribution of the project to developing and implementing the Plan.

On 19 September 2018, the Ministry of Economics presented the topical issues regarding the development of the Plan within the project *Putting Regions on Track for Carbon Neutrality by 2050* (C-TRACK-50) implemented by Riga Planning Region to the representatives of a number of local governments.

On 30 October 2018, the topical issues regarding the development of the Plan and the involvement of local governments required for fulfilling the conditions to be included in the Plan was discussed with the representatives of all planning regions of Latvia.

[65] https://likumi.lv/doc.php?id=207119; https://likumi.lv/doc.php?id=74746; https://likumi.lv/doc.php?id=74749; https://likumi.lv/doc.php?id=79100; https://likumi.lv/doc.php?id=228051

1.3.3. Consultations with stakeholders, including social partners, and engagement of civil society

On 31 August 2018 and 31 October 2018, the topical issues regarding the development of the Plan were presented to the Energy Committee of the National Economy Council established by the Ministry of Economics[66] with the following social partners among the members of the Council: Employers' Confederation of Latvia, Latvian Chamber of Commerce and Industry, Latvian Association of Local and Regional Governments, Latvian Renewable Energy Federation, Latvian Wood Industry Federation, Energy Efficiency Association of Latvia, Latvian Association of Heating Companies, etc.

On 13 September 2018, the Minister of Economics gave a presentation at the conference *Energy 2018* and, among other things, informed the participants of the conference about the development of the Plan and the conditions to be included in it.

The Deputy State Secretary of the Ministry of Economics presented the process of developing the Plan, the conditions and targets to be included in it, as well as the current situation and projections for the baseline scenario at the conference *Heat Production Economy in a Sustainable Country* on 10 October 2018 and at the conference *Nordic-Baltic Energy and Climate Challenge: Mobility and Circularity* on 18 October 2018.

The Ministry of Economics organised a major conference for a larger audience *National Energy and Climate Plan 2021–2030: Energy Development and Climate Change Mitigation* on 26 November 2018 (with about 100 participants) with the discussion about all the dimensions of the Plan where all the participants had an opportunity to make suggestions, express opinions, and comment on the issues. Presentations and the video recording from the conference is available on the Web page of the Ministry of Economics[67].

The first version of the Plan was published on the Web page of the Ministry of Economics on 17 September 2018 to ensure public participation. The second version of the Plan was published on the Web page of the Ministry of Economics on 5 November 2018.

1.3.4. Consultations with other Member States

At the Meeting of the Baltic Ministers of Environmental Affairs on 23–24 May 2018, ministers and experts shared ideas and experience about the development of the Plan and the conditions for decarbonisation for the purposes of climate change mitigation to be included in the Plan.

At the Baltic Council of Ministers' Committee of Senior Energy Officials on 9 August 2018, experts from Latvia, Lithuania, Estonia, and Finland discussed cross-border cooperation issues in the energy sector and exchanged opinions about the conditions for further regional cooperation during the development and implementation of the Plan.

Latvian, Lithuanian, and Estonian experts responsible for the development of the Plan met in Tallinn on 27 September 2018 to discuss regional consultations of the Plan and further cooperation opportunities within the dimensions of the Plan.

At the Baltic Council of Ministers' Committee of Senior Energy Officials on 30 October 2018, Latvian, Lithuanian, and Estonian experts discussed specific measures of the Plan with a regional impact.

[66] The Energy Committee of the National Economy Council was established according to Sections 6.11, 7.2, and 17 of the Cabinet Regulation No. 271 of 23 March 2010 "Statute of the Ministry of Economics" and Section 12 of the Statute of the National Economy Council of the Ministry of Economics No 1-7-32 of 9 November 2012.

[67] https://em.gov.lv/lv/par_ministriju/notikumu_kalendars/21866-konference-nacionalais-energetikas-un-klimata-plans-2021-2030gadam-energetikas-attistiba-un-klimata-parmainu-mazinasana

1.3.5. Iterative process with the EC

Did not take place.

1.4. Regional cooperation in preparing the Plan

Regional cooperation between the Baltic States is currently of particular importance not only for the development of energy policy and energy market development of all three countries, but also on a larger scale, including Finland, Sweden, Poland, Denmark, and Germany. At the EU level, there is the Baltic Energy Market Interconnection Plan (BEMIP) that covers infrastructure planning and helps attract and make good use of financial instruments, including the Connecting Europe Facility established in 2014 that will support only cross-border energy projects, which will facilitate even closer cooperation in the Baltics.

In order to increase the security of gas supply and promote effective market development in the Baltic States, several projects are being implemented with regard to provision of interconnections and modernisation of Inčukalns Underground Gas Storage Facility.

Regional cooperation opportunities in the area of RES and their technologies were also identified during regional consultations. The existing cooperation in the area of infrastructure development should be extended to joint action in the area of developing energy efficiency and RE, e.g. decarbonisation of the transport sector and use of RE (e.g. electricity and biofuels) in transport, as these are challenging issues for the Baltic States.

Furthermore, when developing long-term energy policy plans, e.g. for 2030 and beyond, there should be a possibility for mutual exchange of experience and knowledge, which would help choose the most suitable tools and actions for reaching specific goals. The priority is to transfer and share knowledge about the reduction of carbon emissions and promotion of energy efficiency.

2. NATIONAL OBJECTIVES AND TARGETS

2.1. Decarbonisation

2.1.1. GHG emissions and CO_2 sequestration

2.1.1.1. Latvia's targets for GHG emission reduction from non-ETS activities for 2030 and annual objectives for 2021–2030

SDSL2030 lays down the GHG emission reduction target for 2030 — the total GHG emissions in Latvia in 2030 should be less than 45 % of the total GHG emissions in Latvia in 1990.

EPG2020 lay down the national GHG emission reduction and CO_2 sequestration targets, which are in line with those defined by the EU legislation.

LCDS2050 informative report[68] with optional targets for 2030, 2040, and 2050 was announced in the Meeting of State Secretaries on 30 August 2018. At the time of submitting the draft Plan the targets have not been approved and the initial agreement on them has not been reached.

Since Latvia is a member of the EU, its climate objectives are in line with EU climate policy objectives, as well as the international climate policy — the Convention, Kyoto Protocol, and Paris Agreement.

The Paris Agreement was adopted on 12 December 2015 at the 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in Paris. The law on ratification of the Paris Agreement was adopted by the Saeima on 2 February 2017 and was announced by the President on 8 February.

The Paris Agreement lays down a number of targets that Latvia as a party to the Paris Agreement also has to pursue. The objective of the Paris Agreement is to strengthen the global action in combating climate change and:

- keep a global temperature rise well below 2° C above pre-industrial levels and pursue efforts to limit the temperature increase even further to 1.5° C, as this will significantly reduce the risks and impacts of climate change;
- improve adaptation to adverse impacts of climate change and foster climate resilience;
- promote investments for low carbon and climate resilient development.

The Paris Agreement aims to achieve a balance between anthropogenic GHG emissions by various sources and their removal by various sinks in the second half of this century. There is also an objective regarding adaptation — enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in the Paris Agreement.

At the EU level, there is a common GHG emission reduction target that is divided into two parts: activities covered by the ETS and activities not covered by the ETS (non-ETS activities). Common EU targets for the period from 2021 to 2030:

– ETS operators have to reduce the total GHG emissions in the EU by 43 % in the given period (compared to the GHG emissions of these operators in 2005);

[68] http://tap.mk.gov.lv/lv/mk/tap/?dateFrom=2017-11-09&dateTo=2018-11-09&text=oglek%C4%BCa+maziet&org=0&area=0&type=0

– the total non-ETS GHG emissions have to be reduced by 30 % in the given period (compared to GHG emissions from non-ETS activities in 2005).

Enforcement of the target is the responsibility of the EC. In order to meet this target, conditions for the operation of ETS and the responsibilities of ETS operators have been approved by EU legislation. GHG emission reduction measures for ETS operators have been established in a coordinated way in Directive 2003/87/EC[69] and the development and implementation of these measures is ensured by the EC together with the EU Member States by complying with the requirements and conditions laid down by Directive 2003/87/EC. Latvian economic operators also participate in the ETS.

The GHG emission reduction target from non-ETS activities (hereinafter — non-ETS target) is redistributed among all EU Member States, including Latvia. The target for each EU Member State and conditions for its fulfilment for the period from 2021 to 2030 are laid down by Regulation 2018/842[70]. Latvia has to ensure a GHG emission reduction from non-ETS activities by 6 % in the period from 2021 to 2030 compared to the GHG emissions from non-ETS activities in 2005. The target for the entire period is divided into binding annual targets.

Annual GHG emission reduction targets from non-ETS activities for Latvia for the period from 2021 to 2030 will be set only in 2020 by using the latest available verified GHG inventory data for 2005, 2016, 2017, and 2018 and after the EC implementing act referred to in Article 4 of Regulation 2018/842 is adopted. The annual GHG emission reduction specified in the Plan is therefore indicative.

However, considering the EC recommendations and Article 4(a)(1) of the Proposal for the Regulation on the Governance of the EnU, Latvia has to calculate the binding annual emission allocations for 2021 to 2030 according to the formula provided for in Regulation 2018/842.

> *each Member State shall ensure that its greenhouse gas emissions in each year between 2021 and 2029 do not exceed the limit defined by a linear trajectory, starting on the average of its greenhouse gas emissions during 2016, 2017 and 2018 determined pursuant to paragraph 3 of this Article and ending in 2030 on the limit set for that Member State in Annex I to this Regulation. The linear trajectory of a Member State shall start either at five-twelfths of the distance from 2019 to 2020 or in 2020, whichever results in a lower allocation for that Member State.*

Table 2. Calculated binding annual indicative GHG emission reductions from non-ETS activities for Latvia from 2021 to 2030[71]

	GHG emissions from non-ETS activities (tonnes)[72]	Emission allocation in 2020[73]	Annual emission allocations from 2021 to 2030[74]
2005	8,599,626		
2016	9,107,440		

[69] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:02003L0087-20180408&qid=1533277840239&from=LV
[70] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32018R0841&from=lv
[71] Values specified in the table are indicative, as the values for 2017 and 2018 required for the calculation are not available for the annual inventory and will only be available in the second half of 2020.
[72] Data for 2005, GHG inventory 2018: https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018; Data for 2016: http://cdr.eionet.europa.eu/lv/eu/mmr/art07_inventory/ghg_inventory/envwu6qfa/; Data for 2017: http://cdr.eionet.europa.eu/lv/eu/mmr/art08_proxy/envw07vaw/; Data for 2018: according to the latest projections
[73] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32017D1471&from=EN; https://eur-lex.europa.eu/legal-content/LV/TXT/HTML/?uri=CELEX:32013D0634&from=EN
[74] IPE estimate

2017	*9,203,420*		
2018	*9,011,555*		
2020		9,991,829	
2021			8,954,301
2022			8,857,562
2023			8,760,822
2024			8,664,083
2025			8,567,344
2026			8,470,605
2027			8,373,866
2028			8,277 126
2029			8,180,387
2030			8,083,648

2.1.1.2. Accounting of GHG emissions and removals in the LULUCF sector from 2020 to 2030

Commitments and GHG emission and CO_2 accounting rules in the LULUCF sector for EU Member States for the period after 2020 are laid down by Regulation 2018/841. According to Article 4 of Regulation 2018/841, Latvia, making use of the provided flexibilities, shall ensure that the amount of GHG emissions accounted according to the accounting rules laid down in the Regulation does not exceed the amount of CO_2 removals accounted in the land accounting categories specified in Article 2 of Regulation 2018/841: afforested land, deforested land, managed cropland, managed grassland, managed forest land, managed wetland (accounted from 2026). The accounting of emissions and removals is performed according to Regulation 2018/841 by calculating changes in the amount of GHG emissions and/or CO_2 removals measured against the reference levels laid down by Regulation 2018/841, except afforested lands and deforested lands, as these land accounting categories are accounted using the "gross-net" approach, i.e. no reference level is set and the accounting includes GHG emissions and CO_2 removals over the entire period.

Table 3. Summary of targets for Latvia[75]

	2013–2020	**2021–2025**	**2026–2030**

[75] 1 — target compared to 2005.
2 — according to Decision 406/2009/EC and Regulation (EU) No 525/2013.
3 — according to Directive 2003/87/EC.
4 — the forest reference level for *2013 to 2020* of 16,302 kt of CO_2 eq. based on Section 15 of Decision 2/CMP.7 approved by the Parties to the Agreement will be recalculated for the purposes of technical corrections after 2020, therefore the final value will change. The forest reference level for 2021 to 2025 will be calculated by 31 December 2018 and established by a delegated act of the European Union by 31 October 2020 by using calculations according to Regulation 2018/841. The forest reference level for 2026 to 2030 will be calculated by 30 June 2023 and established by a delegated act of the European Union by 30 April 2025.
5 — Latvia will report the activities of forest management, afforestation, and deforestation (Section 3.4 and 3.3 of the KP respectively) according to the requirements of Decision 2/CMP.7 at the end of the second period. Calculated as the sum of total emissions and total removals in the respective activities (represented on the left side of the table) according to accounting rules laid down by Decision 2/CMP.7.
6 — according to Regulation 2018/842, annual targets will be established by Commission decision.
7 — according to Directive (EU) 2018/410.
8 — calculated as the sum of total emissions and total removals in all land accounting categories specified in Article 2 of Regulation 2018/841 (represented on the left side of the table) according to the accounting rules laid down by Regulation 2018/841.

<table>
<tr><td rowspan="2">Reduction of GHG emissions</td><td>Non-ETS emissions of Latvia</td><td>+17 %[1] (also divided into annual targets)[2]</td><td colspan="2">-6%[1] (will also be divided into annual targets)[6]</td></tr>
<tr><td>EU ETS emissions</td><td>-21%[1] (divided into annual targets for specific facilities)[3]</td><td colspan="2">-43%[1] (will be divided into annual targets for specific facilities)[7]</td></tr>
<tr><td rowspan="6">LULUCF</td><td>Afforested land</td><td rowspan="3">Accounted GHG emissions do not exceed accounted GHG removals[5]</td><td rowspan="4">Accounted GHG emissions do not exceed accounted GHG removals[8]</td><td rowspan="4">Accounted GHG emissions do not exceed accounted GHG removals[8]</td></tr>
<tr><td>Deforested land</td></tr>
<tr><td>Managed forest land (forest reference level)[4]</td></tr>
<tr><td>Managed cropland</td><td></td></tr>
<tr><td>Managed grassland</td><td></td><td></td><td></td></tr>
<tr><td>Managed wetland</td><td></td><td></td><td></td></tr>
</table>

2.1.1.3. Other binding objectives in this category and other national objectives and targets

NDPL2020[76] lays down the target for the intensity of greenhouse gas emissions in the Latvian economy (tonnes of CO_2 equivalent per LVL 1,000 of GDP) for 2020 and 2030, which is 1,13 and 1,07 t CO_2 eq./LVL 1,000 of GDP.

MoEPRD has started to work on developing the Climate Change Adaptation Strategy of Latvia 2030 with the overarching goal to – "reduce vulnerability of Latvia's people, economy, infrastructure, buildings, and nature to the effects of climate change and promote the use of opportunities created by climate change". In order to reach it, the following priorities have been set:

1) human life, health, and well-being is protected from adverse impacts of climate change irrespective of gender, age, or membership of a social group;
2) economy is able to adapt to climate change and use the opportunities it provides;
3) infrastructure and buildings are climate resilient and planned in the light of possible climate change risks;
4) natural and cultural values of Latvia are preserved by limiting any adverse impacts of climate change;
5) knowledge and information for the development and implementation of climate change adaptation policy is ensured based on the latest scientific argumentation.

RDP2020[77] is an important tool for ensuring balanced development of rural areas, competitiveness, and sustainable use of natural resources in the country. The rural development policy has the following long-term strategic objectives:

1) competitiveness of agriculture;

[76] http://polsis.mk.gov.lv/documents/4247
[77] https://www.zm.gov.lv/zemkopibas-ministrija/statiskas-lapas/latvijas-lauku-attistibas-programma-2014-2020-gadam?id=14234#jump

2) sustainable management of natural resources and climate action;

3) balanced territorial development of rural areas.

In order to reach the objectives of the rural development policy, the following common EU rural development priorities have been established:

1) fostering knowledge transfer and innovation in agriculture, forestry and rural areas;

2) enhancing competitiveness of all types of agriculture and enhancing farm viability;

3) promoting food chain organisation and risk management in agriculture;

4) restoring, preserving and enhancing ecosystems dependant on agriculture and forestry;

5) promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors;

6) promoting social inclusion, poverty reduction, and economic development in rural areas.

GDFRS2020[78] is a medium term policy planning document that lays down medium term (2015–2020) strategic objectives of the forestry industry, guidelines for policy development, lines of action for reaching the objectives, obstacles to reaching the objectives, as well as policy outcomes. MSNP2020 lays down the following forestry development policies:

1) forest management in Latvia is sustainable and recognised globally;

2) Latvian forestry products are competitive, have a high added value, and meet customer needs;

3) educational and scientific potential and human skills correspond to the development of the forestry industry and related sectors.

Table 4. Latvia's targets for GHG emissions and CO_2 removals and their performance indicators

Policy outcome in the sub-dimension of GHG reduction and CO_2 removals of the decarbonisation dimension	**Actual value**		**Target value**	
	Reference value (2016)	**2017[79]**	**2020**	**2030**
1. GHG emission reduction (% compared to 1990)	**-57.3**	**-57.4**	**-**	**-55**[80]
2. GHG emission reduction (Mt CO_2 eq.)	**11.3**	**11.3**	**12.13**[81]	**-**
3. Non-ETS activities (% compared to 2005)	**+6**	**+7**	**+17**[82]	**-6**[83]
4. Non-ETS activities (Mt CO_2 eq.)	**9.1**	**9.2**	**9.9**[84] **10**[85]	**-**
5. ETS activities (% compared to 2005)	**-23**	**-28**	**-21**[86]	**-**

[78] http://polsis.mk.gov.lv/documents/5331
[79] Approximate value, to be confirmed in the final version of the Plan in 2019 according to the official statistical data of Latvia
[80] http://polsis.mk.gov.lv/documents/3323
[81] http://polsis.mk.gov.lv/documents/4711
[82] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32009D0406&from=EN
[83] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32018R0842&from=EN
[84] http://polsis.mk.gov.lv/documents/4711
[85] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32017D1471&from=EN; https://eur-lex.europa.eu/legal-content/LV/TXT/HTML/?uri=CELEX:32013D0634&from=EN
[86] http://www.varam.gov.lv/lat/pol/ppd/vide/?doc=17913

Policy outcome in the sub-dimension of GHG reduction and CO_2 removals of the decarbonisation dimension	Actual value		Target value	
	Reference value (2016)	2017[79]	2020	2030
6. ETS activities (Mt CO_2 eq.)	**2.1**	**2.0**	**2.26**[87]	**-**
7. LULUCF accounting categories (million units)	-[88]	-[89]	**0**	**3.1**[90]

2.1.2. Renewable energy

2.1.2.1. Conditions for Latvia's contribution to renewable energy

At the EU level, a common binding 2030 target for all Member States for RE in the total final energy consumption is established in the Proposal for amending Directive 2009/28/EC[91,92] — a 32 % share of RE in the total final energy consumption in the EU (including electricity, heating, and transport) with national targets for 2020 as the baseline (as of 2021, the share of RE in the final energy consumption cannot be lower than national targets for 2020). All EU Member States have to determine their national contributions to the common EU target.

2.1.2.2. Contribution of Latvia to the RE target of the EU

According to the Proposal for amending Directive 2009/28/EC, Latvia offers the following contribution to the common binding RE target for the EU — **to ensure the share of RE in Latvia's final energy consumption of at least 45 % by 2030**.

When determining its contribution to the common RE target of the EU, Latvia has taken into consideration the following peculiarities and possible obstacles for the country:

- Latvia's RE target for 2020 is 40% of RE in the final energy consumption, which is the second highest in the EU, while its GDP per capita in 2017 was the fourth lowest in the EU[93]. Latvia intends to reach the 2020 target;
- there was already a significant share of RE in energy production in Latvia in 2016/2017 (second highest in the EU) and a substantial further increase will be particularly difficult to reach. The share of RE in electricity, heating and cooling exceeds 50 % (only Sweden exceeds 50 % in these two categories), while the EU-28 average in the share of RE is below 30 % in electricity and below 20 % in heating and cooling. Possibilities of increasing the share of RE in electricity by reasonable means so as not to impose a disproportionate burden on the price of electricity are currently almost exhausted;
- biomass already represents 74.1 % of the fuels used by households and 42.2 % of energy consumption in households (including thermal energy and electricity);
- in order for Latvia to deliver with regard to the contribution to the common EU target of 45 % of RE, Latvia will have to invest additional 0.21 % of GDP during the period covered by the Plan in addition to the investments in the baseline scenario for ensuring the share of RE of 41.2 % in the final energy consumption of Latvia;

[87] http://polsis.mk.gov.lv/documents/4711
[88] Cannot be estimated by using the method established by Regulation 2018/841
[89] Cannot be estimated by using the method established by Regulation 2018/841
[90] https://eur-lex.europa.eu/legal-content/LV/TXT/PDF/?uri=CELEX:32018R0841&from=EN
[91] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_10308_2018_INIT&from=LV
[92] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_10308_2018_COR_1&from=LV
[93] https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=sdg_08_10&plugin=1

- since EU ETS in Latvia covers less than 20 % of the total GHG emissions in Latvia, only a small amount of funding is available from financing mechanisms established within the EU ETS, such as EAAI and Modernisation Fund. Moreover, as one of the small EU Member States, Latvia receives considerably small amounts of EU funds, which will decrease for the 2021–2027 period of the MFF compared to the programming period until 2020. In view of these factors, it has been concluded that Latvia has limited funds available to implement measures for reaching ambitious goals;
- Latvia has to ensure the interconnection capacity of 80 % (the ratio of interconnection capacity to the total electricity capacity of Latvia) and take into consideration the demand for higher capacity of the neighbouring countries with whom the interconnections are established;
- Latvia has to ensure self-sufficiency with regard to the electricity produced and has to take into consideration the increasing demand for electricity;
- Latvia has to ensure permanent capacity to provide energy security, and due to its geographic location Latvia may require a significant amount of additional capacities during the colder months of the year.

2.1.2.3. Sectoral share of RE in 2021–2030

According to the Proposal for the Regulation on the Governance of the EnU, Latvia's contribution of RE to the common EU target for RE is reflected in an optional curve as follows:

- in 2022, the optional curve reaches the reference point of at least 18 % of the total increase in the share of RE compared to the binding national target for 2020 and its contribution to the target for 2030;
- in 2025, the optional curve reaches the reference point of at least 43 % of the total increase in the share of RE compared to the binding national target for 2020 and its contribution to the target for 2030;
- in 2027, the optional curve reaches the reference point of at least 65 % of the total increase in the share of RE compared to the binding national target for 2020 and its contribution to the target for 2030.

A separate target in the electricity sector has not been set. The Proposal for amending Directive 2009/28/EC is aimed at promoting own use of electricity. However, the estimates and the current development of the system of own use of electricity suggest that its contribution to the RE target for 2030 would not exceed 0.01 %. Since own use plays a key role in promoting awareness of the society and support for RE, Latvia has laid down conditions for promoting own use.

In the thermal energy sector, Member States have to implement measures to endeavour to ensure annual increase of the share of RE of 1.1 % (if waste heat or waste cold is not used) in heating and cooling, measured as an average from 2021 to 2025 and from 2026 to 2030. Any increase of the share of RE is permissible in the countries with a share of RE in this sector of above 60 %, while half of the increase is permissible in the countries with a share of RE of above 50 %.

According to EUROSTAT, the share of RE in heating in Latvia in 2014–2016 was around 52 % (52.2 %, 51.8 %, and 51.9 % respectively). It is estimated that the share of RE in heating production in Latvia after 2020 will be above 50% but will not exceed 60 %. It means that Latvia will have to ensure an annual increase of an average of 0.55 % within a five year

period. If 52 % is considered a reference point in 2020, the share of RE in the heating sector would have to reach at least 54.75 % in 2025 and least 57.5 % in 2030.

In the transport sector, Latvia, along with other EU Member States, has to ensure that the share of RE in the final energy consumption in 2030 reaches 14 % by imposing an obligation on fuel suppliers (the target for this in 2020 is a 10 % share). Binding targets have also been introduced for advanced biofuels[94] by establishing that 0.2 % of the total share of RE in transport are advanced biofuels by 2022 and the share increases to 3.5 % by 2030. When determining the share of RE in transport, the share of first generation biofuels, which are produced from food and feed crops, may exceed the share of such biofuels by up to 1 % in 2020 in the respective Member State, and at the same time the share of first generation biofuels cannot be higher than 7 %. However, if a Member State decides that the inclusion of first generation biofuels in the RE target for transport must be limited to below 7 %, it can proportionally reduce the RE target in transport. Moreover, the Proposal for amending Directive 2009/28/EC lays down that in the period from 2023 to 2030 the Member States should gradually phase out biofuels imposing high indirect risks related to land use change and involving the production of raw materials related to the increase in the cropped area in areas with high carbon stocks, and the consumption of such biofuels may not be higher than in 2019. By 1 February 2019 the European Commission has to adopt a delegated act laying down certification criteria for biofuels that impose low indirect risks related to land use change and raw materials that impose high indirect land use change risks and appear to stimulate the increase in the cropped area in areas with high carbon stocks.

The share of first generation biofuels in transport in Latvia in 2014–2016 was around 2 % (2.4 %, 2.3 %, and 1.1 % respectively). For instance, if the share of first generation biofuels in transport reaches 5 % by 2020, Latvia would be able to include first generation biofuels in the RE target by no more than 6 % (5 % + 1 %), while the overall target in transport could be decreased by 1 % (7 % - 6 %) and would be 13 %. It is expected that Latvia will be able to set a lower threshold for first generation biofuel, thus reducing the target even more (5 % ceiling — 12 % target, 4 % ceiling — 11 % target, 3 % ceiling — 10 % target).

Table 5. Latvia's targets for RE and their performance indicators

Policy outcome in the sub-dimension of RE of the decarbonisation dimension	**Actual value**	**Target value**				
	2016	**2020**	**2022**	**2025**	**2027**	**2030**
1. Share of renewable energy in the final energy consumption (%)	**37.2**	**40**[95]	**41.25**	**42.5**	**43.75**	**45**
2. Share of renewable energy in the final energy consumption in transport (%)	**2.8**	**10**[96]	**-**	**-**	**-**	**14**[97]
5. Share of advanced biofuels and biogas in the final energy consumption in transport[98]	**0**	**-**	**0.2**	**1**	**-**	**3.5**[99]

[94] Advanced biofuels that are produced from raw materials specified in Annex IX of the Proposal for amending Directive 2009/28/EC, such as algae, straw, animal manure and sewage sludge, glycerine, etc.
[95] http://polsis.mk.gov.lv/documents/4247
[96] Directive 2009/28/EC
[97] Proposal for amending Directive 2009/28/EC
[98] When calculating the share of RE in transport, the amount of energy produced from advanced biofuels and biogas can be considered doubled if they are produced from raw materials specified in Parts A and B of Annex IX to the Proposal for

2.1.2.4. Renewable energy technology curves

To be updated in the final version of the Plan.

2.1.2.5. Bioenergy demand curves

To be updated in the final version of the Plan.

2.2. Energy efficiency

2.2.1. Contribution of Latvia's energy efficiency to the energy efficiency target of the EU

2.2.1.1. Conditions for Latvia's contribution to energy efficiency

The Proposal for amending Directive 2012/27/EU a binding energy efficiency target of 32.5 % at the EU level for 2030, and each Member State has to determine its own national contributions to the common EU target while taking into account that the total EU primary energy consumption in 2030 cannot exceed 1,273 Mtoe and the final energy consumption — 956 Mtoe.

The Proposal for amending Directive 2012/27/EU lays down an obligation to deliver new annual savings in the final energy consumption of 0.8% in the period from 2021 to 2030 and also for ten year periods after 2030, with energy used in transport partially or fully excluded from calculations in the baseline scenario.

2.2.1.2. Contribution of Latvia to the energy efficiency target of the EU

According to Article 3 of Directive 2012/27/EU, the optional national energy efficiency target for Latvia for 2020 is primary energy consumption (excluding energy consumption for non-energy needs) expressed in absolute units — 225 PJ (5.4 Mtoe). The respective final energy consumption target for 2020, excluding energy consumption for non-energy needs, is 187 PJ (4.47 Mtoe). These optional targets involve primary energy savings of 28 PJ (0.670 Mtoe) and final energy consumption savings of 19 PJ (0.457 Mtoe) in 2020.

According to Article 7 of Directive 2012/27/EU, mandatory cumulative final energy consumption savings for 2020 are 0.850 Mtoe (which corresponds to cumulative energy savings of 9,896 GWh in the period from 2014 to 2020).

Considering that the baseline scenario provides for the implementation of energy efficiency measures, compared to the reference line it can be said that this scenario defines Latvia's contribution to the energy efficiency target of the EU according to the Proposal for the Regulation on the Governance of the EnU and Directive 2012/27/EU. Therefore **Latvia offers the following contribution to the energy efficiency target of the EU for the period from 2021 to 2030**:

- optional national contribution — primary energy consumption of 180.98 PJ (4.325 Mtoe, 49,950.5 GWh), which is 19.56 % lower than the optional national target for 2020. This optional national contribution, expressed as final energy consumption (excluding energy consumption for non-energy needs) is 149.3 PJ (3.57 Mtoe), which is 20.2 % lower than the optional national target for 2020;

amending Directive 2009/28/EC. The use of raw materials specified in Part B is limited to 1.7 % of the final consumption in transport (calculated from the amount of energy), thus the share of biofuels and biogas produced from the raw materials specified in Part B will not be allowed to exceed 3.4 % (with double counting) in 2030.

[99] Proposal for amending Directive 2009/28/EC

- mandatory national target calculated for Latvia — cumulative final energy consumption savings in the period from 2021 to 2030 of 19,871 GWh (71.53 PJ, 1.71 Mtoe), which is 100.9 % higher than in the period from 2014 to 2020. Since official statistical data about final energy consumption in 2018 is not available in December 2018, the data about annual new savings and cumulated energy savings are indicative and will be updated by 31 December 2019 before submitting the final version of the Plan to the EC.

When determining its optional contribution of primary energy consumption, Latvia takes into account that:

- Latvia has to ensure the national interconnection capacity of 80 % (the ratio of interconnection capacity to the total electricity capacity of Latvia) and comply with the plans of Lithuania and Estonia regarding electricity imports and the use of interconnections;
- Latvia has limited funds available to implement measures for reaching ambitious goals. Since EU ETS in Latvia covers less than 20 % of the total GHG emissions in Latvia, only a small amount of funding is available from financing mechanisms established within the EU ETS, such as EAAI and Modernisation Fund. Moreover, as one of the small EU Member States, Latvia receives considerably small amounts of EU funds, which will decrease for the 2021–2027 period of the MFF compared to the programming period until 2020.
- Latvia has to ensure permanent capacity to provide energy security, and due to its geographic location Latvia may require a significant amount of additional capacities during the colder months of the year.

Table 6. Latvia's targets for improving energy efficiency and their performance indicators

Policy outcome in the energy efficiency dimension	**Actual value**	**Target value**	
	2016	**2020**	**2030**
Optional target — primary energy consumption[100] (Mtoe)	4.39	5.4	4.33
Optional target — final energy consumption (Mtoe)	3.92	-	3.57
Mandatory national target — cumulated final energy savings (Mtoe)	0.18	0.85	1.71
3 % of the floor area of central government buildings renovated each year (total renovated m^2)	232,635	678,460	*tbc*
Specific heat consumption in buildings (kWh/m2/year)	*tbc*	150	*tbc*
Target for developing nearly zero-energy buildings[101] (consumption levels of nearly zero-energy buildings)	*tbc*	from 2019 for government buildings[102] from 2021 for other new buildings[103]	*tbc*

[100] Gross domestic energy consumption
[101] The definition of a nearly zero-energy consumption building is provided in Section 1, Clause 6 of the Law On the Energy Performance of Buildings and Section 17 of Cabinet Regulation No. 383 of 9 July 2013 “Regulations Regarding Energy Certification of Buildings”.
[102] Owned by the state or in possession of national authorities with national authorities occupying such buildings
[103] Other new buildings

Policy outcome in the energy efficiency dimension	Actual value	Target value	
	2016	2020	2030
Energy intensity in economy — energy consumption for generating GDP (kg toe per EUR 1 million of GDP[104])	193	195	*tbc*

2.2.2. Total energy savings

The optional energy efficiency target of total energy savings over the entire period for Latvia is laid down by Directive 2012/27/EU and Proposal for amending Directive 2012/27/EU, which also establishes a method for calculating the total cumulative savings. According to the Proposal for amending Directive 2012/27/EU, Latvia has to ensure new savings of 0.8 % of the annual final energy consumption annually by calculating these savings as the average over the three years before 1 January 2019.

Since official statistical data about final energy consumption in 2018 is not available at the moment of submitting the draft Plan to the EC, the data about annual new savings and total energy savings are indicative and will be updated by 31 December 2019 before submitting the final version of the Plan to the EC.

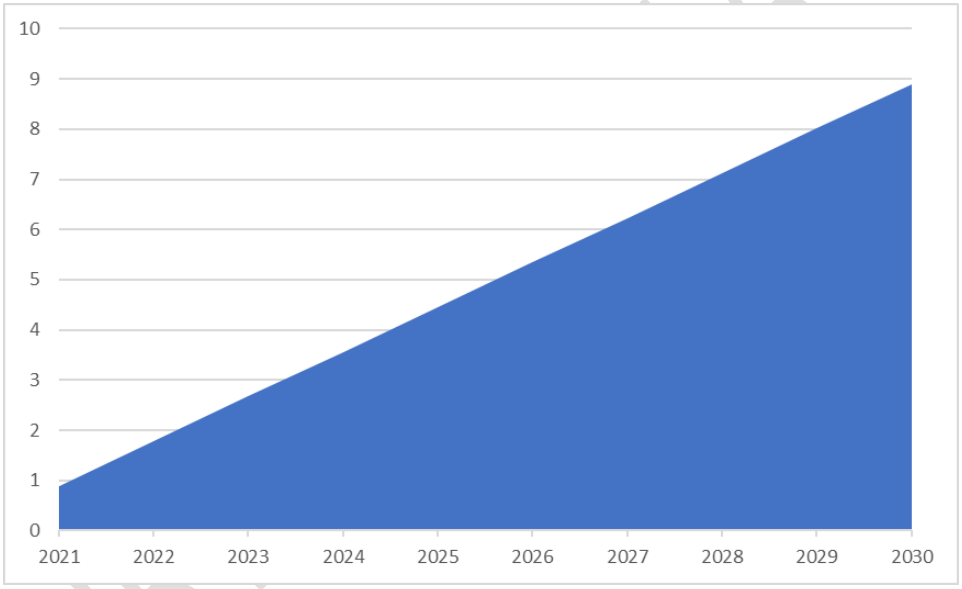


Figure 4. Theoretical calculations of the mandatory target of cumulative final energy consumption savings 2021–2030 (PJ)

Considering the methodology laid down by the Proposal for amending Directive 2012/27/EU, the annual quantity of new savings for Latvia is established at 1.3 PJ and the total energy savings for the period from 2021 to 2030 is established as Latvia's mandatory target of cumulating the final energy savings of **19,871 GWh (71.53 PJ)**.

2.2.3. Long-term renovation strategy

According to Article 2(a) of Directive 2010/31/EU[105], Member States have to update and submit their long-term strategies to the EC together with the final version of the Plan, which is to be submitted to the EC by 31 December 2019. There is however a derogation from this

[104] At constant 2010 prices

[105] https://eur-lex.europa.eu/legal-content/LV/TXT/?qid=1533109262415&uri=CELEX:02010L0031-20180709 (amended by Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency and Proposal for the Regulation on the Governance of the EnU)

condition for the first long-term renovation strategy that can be submitted to the EC by 10 March 2020.

Therefore the Latvian Long-term Strategy for Renovation of Buildings is not included in this Plan and will be submitted within the time limit laid down by Directive 2010/31/EU.

The Long-term Strategy for Renovation of Buildings[106] currently in force sets the following objectives in the area of energy performance of buildings:

1) availability of funding for economically justified projects in the entire territory of Latvia, including regions;
2) high-quality management and monitoring of projects;
3) focusing of monitoring of activities on obtaining results, including energy savings;
4) reaching a high level of energy efficiency and high quality of construction;
5) improving a selection procedure of construction enterprises;
6) reducing costs of resources.

According to Directive 2012/27/EU, Latvia has an obligation to renovate 3 % of the total floor area of central government buildings each year (maximum estimate — a total of 678,460 m^2).

Table 7. Latvia's long-term targets for the energy performance of buildings

Goal 2014–2020 programming period for EU funds	**Target indicators**	**Indicative funding (EUR)**	**Implementation period**
Mandatory renovation of 3 % of the total floor area of central government buildings, renovation of local government buildings, industrial buildings, and multi-apartment buildings	• Savings — 1,690 GWh/year, average energy consumption for heating — 120 kWh/m^2 • Number of households with improved energy consumption classification — 14,286 (by 2023) • Annual reduction of primary energy consumption — 52,000,000 kWh • Energy consumption for generating GDP —263.9 kg toe per EUR 1,000 of GDP (for production buildings by 2023)	Total funding of EUR 384 million, including EUR 323 million from EU funds and EUR 57 million public funding from the state[107]	2014–2023
Promoting energy efficiency and use of local RES in district heating. Share of renewable energy in DH — 60 %	Increase of the output from RES — 70 MW. Reconstructed heating networks — 70 km (by 2023)	EUR 53 million funding form EU funds[108]	2014–2023
Raising awareness of the society about various	50 awareness raising events a year (publicity events to be held	EUR 260,000 from the EU funds for	2014–2023

[106] http://polsis.mk.gov.lv/documents/6043
[107] Implementation of the specific support objective 4.2.1 "To promote the increase of energy efficiency in public and residential buildings" of the Operational Programme "Growth and Employment".
[108] Implementation of the specific support objective 4.3.1 "To promote energy efficiency and use of local RES in district heating" of the Operational Programme "Growth and Employment".

Goal 2014–2020 programming period for EU funds	Target indicators	Indicative funding (EUR)	Implementation period
opportunities and practices to increase energy efficiency	within the campaign *Dzīvo Siltāk* (*Live Warmer*))	technical assistance	

2.2.4. Total renovated area or equal annual energy savings

The Long-term Strategy for Renovation of Buildings[109] currently in force lays down the following targets with regard to the total renovated area by 2020 by taking into account the main obligation of 3 % of the floor area of central government buildings renovated each year (total renovated m^2):

- 2014 — 77,6780 m^2;
- 2015 — 74,909 m^2 (renovated area — 232,635 m^2);
- 2016 — 66,175 m^2;
- 2017 — 59,980 m^2 (renovated area — 136,155 m^2);
- 2018 — 57,313 m^2.

According to Article 2(a) of Directive 2010/31/EU[110], Member States have to update and submit their long-term strategies to the EC together with the final version of the Plan, which is to be submitted to the EC by 31 December 2019. There is however a derogation from this condition for the first long-term renovation strategy that can be submitted to the EC by 10 March 2020.

Therefore the Latvian Long-term Strategy for Renovation of Buildings is not included in this Plan and will be submitted within the time limit laid down by Directive 2010/31/EU.

2.2.5. Optional interim objectives for 2030, 2040, and 2050

According to Article 2(a) of Directive 2010/31/EU[111], Member States have to update and submit their long-term strategies to the EC together with the final version of the Plan, which is to be submitted to the EC by 31 December 2019. There is however a derogation from this condition for the first long-term renovation strategy that can be submitted to the EC by 10 March 2020.

Therefore the Latvian Long-term Strategy for Renovation of Buildings is not included in this Plan and will be submitted within the time limit laid down by Directive 2010/31/EU.

2.2.6. Other national objectives

The objective of NIPG2020 as the national industrial policy — to promote structural changes in the economy for the benefit of producing goods and services with higher added value, including increasing the role of industry, modernising industry and services, and developing exports of more complex goods with higher added value.

[109] http://polsis.mk.gov.lv/documents/6043

[110] https://eur-lex.europa.eu/legal-content/LV/TXT/?qid=1533109262415&uri=CELEX:02010L0031-20180709 (amended by Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency and Proposal for the Regulation on the Governance of the EnU)

[111] https://eur-lex.europa.eu/legal-content/LV/TXT/?qid=1533109262415&uri=CELEX:02010L0031-20180709 (amended by Directive (EU) 2018/844 of the European Parliament and of the Council of 30 May 2018 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency and Proposal for the Regulation on the Governance of the EnU)

2.3. Energy security

2.3.1. National objectives or conditions

The Baltic Transmission System Operators (hereinafter — BALTSO) concluded an agreement in 2013 about electricity trade with third countries in the Baltic States to take place only through Lithuania's trading area. According to this agreement, BALTSO assigns 0 MW for the trade on the interconnections between Russia and Estonian and Russia and Latvia, while the trade throughput of the interconnections between Lithuania and Belarus and Kaliningrad and Lithuania is calculated according to the methodology approved by the Baltic regulators.

16 % of the total electricity imports in the Baltic States came from third countries in 2018. Since electricity trade in the Baltic States takes place via the Nord Pool power market and the physical electricity flows do no not always match the commercial flows, it is not possible to determine the exact consumption of electricity coming from Russia and Belarus in each country and to identify energy transit flows, for example, between various regions of Russia. However, considering that it is Lithuania that consumes a substantial part of imported electricity, there are reasonable grounds for believing that also most electricity imported from third countries is consumed in Lithuania.

The Baltic States have imported 982,458 MWh of electricity from third countries in the first half of 2018 (from January to June). Total electricity imports from third countries in 2017 amounted to 776,397 MWh. Electricity imports decreased by 16 % in 2017 compared to 2016, while exports from the electric power system of Latvia increased by about 9 % compared to 2016. By the end of 2018 Latvia has not made a national decision about changing the existing policy regarding electricity trade with third countries. When making such a decision, a number of important technical and commercial considerations would have to be taken into account, for example, creating an environment for equal competition in the Baltic market for electricity producers in the EU and third countries, the impact of third country imports on the pricing of electricity in the wholesale market and the security of energy supply, as well as potential investments required for ensuring electricity imports from third countries in the long term, especially considering that the Baltic electricity networks will no longer be synchronised with the electric power systems of Russia and Belarus.

An important element of the current operation conditions is the BRELL (Belarus, Russia, Estonia, Lithuania, Latvia) agreement concluded between the transmission system operators of the Baltic States, Russia, and Belarus, which provides for a mutual assistance of energy system operators of the countries operating in a synchronous system and, among other things, cooperation in maintaining emergency reserves in the amount of 500 MW, or 100 MW for each member country.

2.3.2. National objectives regarding improvements

In 2012/2013, three transmission system operators (hereinafter — TSO) of the Baltic States — AS Augstsprieguma tīkls, Elering, and Litgrid — in cooperation with the Swedish consulting company Gothia Power carried out a feasibility study about the possibilities to synchronise the electricity grid of the Baltic States with the continental Europe via Poland. It was concluded that synchronisation was technically possible but would require a common political support from the Baltic States and the countries of the Baltic Sea Region, support from national regulatory authorities, mainly Poland, and assistance from the EC to negotiate with Russia and Belarus, as well as significant investments. The agreement about synchronisation via Poland at the level of the Baltic prime ministers was approved in December 2017 by a memorandum of understanding. Based on the results of the additional dynamic and frequency stability studies, the Political Roadmap on the synchronisation of the

Baltic States' electricity networks with the continental European Network via Poland was signed on 28 June 2018.

It is emphasised in this document that the synchronisation of the Baltic States with the continental Europe must ensure a high security level of the Baltic electricity grid and it has to be implemented in a cost-effective way by taking into consideration both capital investments and annual commissioning costs. The Political Roadmap emphasises that the considered technical solution that involves ensuring synchronous operation of the energy systems of the Baltic States and Poland with one synchronous link — the existing double circuit 400 kV electrical power line LitPol Link — does not provide an adequate level of the security of energy supply and commissioning costs. The most optimal solution identified with regard to security and commissioning costs includes synchronisation with two AC electrical power lines. Considering Poland's objections towards the amount of capital expenditure for this solution, the Roadmap provides for a detailed assessment of the technical solution for ensuring synchronous operation with the existing AC power line LitPol Link 1 and a new DC submarine power cable between Poland and Lithuania. This detailed assessment led to a conclusion that in terms of frequency stability it is possible to ensure operational security of the electricity system of the Baltic States (at a standard level consistent with the continental Europe) if the solution of LitPol Link 1 and a submarine cable is implemented. Specific technical measures required in terms of frequency stability to ensure safe synchronous operation of the Baltic electricity system with the synchronous European electricity grid have been identified. Since these measures are based on currently available proven technologies, it is considered that they can be effectively implemented.

2.3.3. National objectives for reducing energy imports

EDG2020 lay down the energy independence (net energy imports/gross domestic energy consumption including bunkering, %) target for 2020 — 44.1 % share of energy imports in gross domestic energy consumption. LTESL2030, for its part, lays down an optional and non-binding target for 2030 — to reduce energy imports from the existing third country suppliers by 50 % compared to 2011 when energy imports from countries outside the European Economic Area amounted to 28.2 TWh. It means that the respective imports cannot be larger than 14.1 TWh by 2030.

It can be observed that Latvia's energy dependency from imported energy sources is reducing — from 55.9 % in 2013 to 47.2 % in 2016. It can therefore be considered that Latvia is meeting its 2020 and 2030 targets through the implementation of current policies and measures. Therefore additional targets for reducing energy imports in Latvia are not set.

2.3.4. National objectives for increasing the flexibility of the national energy system

It is planned to develop national legislation for the operation of aggregators in 2019 by prescribing rights and obligations of aggregators, payment for their services, and relations between aggregators and other participants of the system and market operators. It would promote the capacity of balancing the system and its flexibility. The operation of aggregators in Latvia is not possible without smart meters installed and available for the consumers. The replacement of smart meters is taking place according to Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC. Installation of smart meters has been available since 2007 for legal customers and since 2014 for households. According to the electricity metering modernisation plan of AS Sadales tīkls, it is planned to install smart meters for all customers of AS Sadales tīkls by 2022. The data readout system of smart electricity meters is protected by using multi-layer access principles, and all its layers use data encryption methods, thus excluding any possibility of identifying the name, surname, or address of a specific user in the process of data exchange.

2.4. Internal energy market

2.4.1. Electricity interconnectivity

2.4.1.1. Electricity interconnectivity level

EDG2020 lay down the target for infrastructure connectivity in the electricity market (the ratio of interconnection capacity to total generation capacity expressed in percentage) for 2020 at 10 %. CEPF2030, for its turn, lays down the target for 2030 at 15 %.

According to the current situation, the ratio of interconnections in Latvia in 2017 was 80 % (the ratio of interconnection capacity to the total electricity capacity of Latvia), therefore it can be considered that Latvia has already reached the interconnection target and additional targets as well as additional policies and measures for reaching these targets are not being set.

2.4.2. Energy transmission infrastructure

2.4.2.1. Key electricity and gas transmission infrastructure projects

Interconnections between Member States in the Baltic Sea Region and reinforcing internal grid infrastructures accordingly is intended to prevent isolation of the Baltic States and to foster market integration inter alia by working towards the integration of renewable energy in the region.

Integration of the electricity networks of the Baltic States and their synchronisation with European networks. Integration of the electric networks of the Baltic States into the EU electricity system has been identified as a key strategic priority of the EU energy policy. One of the main reasons for synchronising the Baltic States with the EU is closer integration of the Baltic States into the electricity market of the European Union and increasing long term security of energy supply. The electricity system of the Baltic States currently receives major system services from third countries and ensures electricity transit from third countries. The existing cooperation model between the Baltic States and third countries as well as its legal framework restricts the information exchange with European transmission system operators and limits opportunities to ensure coordinated action (e.g. regarding electrical power line outages) between the Baltic States and the rest of Europe. It is planned that synchronous operation of the power transmission networks of the Baltic States with the European networks will be commissioned within ten years after approving the decision about synchronisation scenarios (i.e. by 2025).

The third Estonia-Latvia interconnection. The Kilingi-Nõmme (Estonia) – Rīga CHPP-2 (Latvia) interconnection project is considered to be one of the most significant projects for the entire Baltic Sea Region, as it will increase the transfer capability by 500/600 MW between Estonia and Latvia and by up to 300/500 MW in an isolated operation mode. The third Estonia-Latvia interconnection also includes a Rīga CHPP-2 – Rīga HPP project as a reinforcement of the internal network of Latvia for the electricity hub of Rīga. It will ensure full functionality of the third Estonia-Latvia interconnection in case of repairs or outages in the transmission networks of Rīga Region. The third Estonia-Latvia interconnection is also one of the most important and central projects in the Baltic power transmission network for the Baltic States to be able to operate in a synchronous system with the networks of the continental Europe in the future.

Tartu (Estonia) – Valmiera (Latvia) interconnection and Tsirgulina (Estonia) – Valmiera (Latvia) interconnection. Similar to the project described above, both 330 kV power transmission lines, Tartu–Valmiera and Tsirgulina–Valmiera, are a precondition for a successful synchronisation of the Baltic electricity systems with the electricity system of the

continental Europe. Modernisation of these two interconnections is intended to completely remove transfer capability limits between Estonia and Latvia also after 2020 when the third Estonia-Latvia interconnection will be put into service, as well as to increase the total transfer capability via the Baltic States by 600 MW.

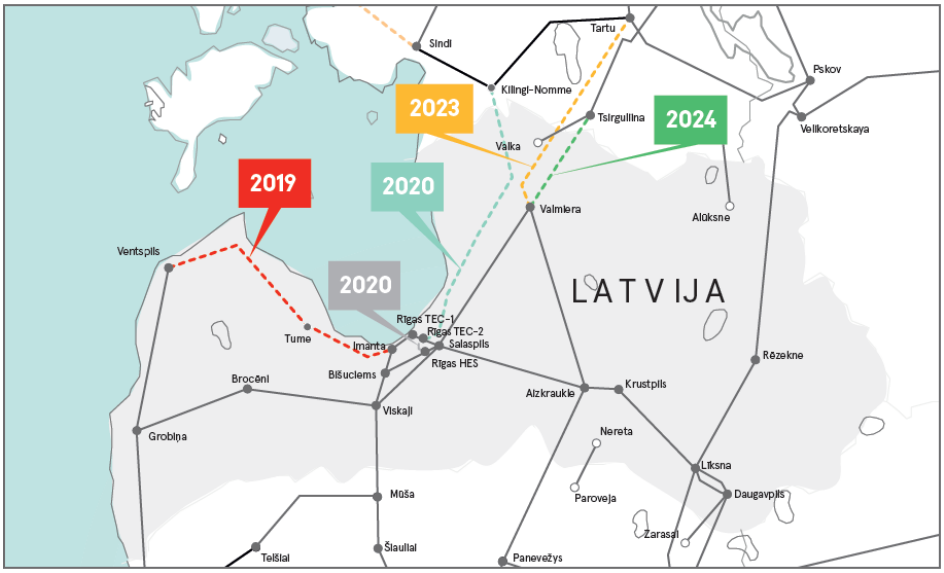


Figure 5. The existing high voltage infrastructure network and planned projects[112]

The main natural gas supply route for the consumers of Latvia are long-distance gas pipeline networks from the Yamal–Europe natural gas pipeline in the Tver Oblast in Russia via Saint Petersburg and Pskov to Estonia and Latvia. In general, the long-distance natural gas pipeline networks in the Baltic States are well developed and their capacity to ensure stable supplies is facilitated by Inčukalns Underground Gas Storage Facility (hereinafter — IUGSF) with a capacity of 2.3 billion m3. However, there are significant restrictions to its use: for example, the connection between the Estonian and Latvian natural gas systems does not ensure the transfer of natural gas from Estonia to Latvia due to the lack of required equipment, while the capacity of the transmission connections of Lithuania and Latvia is insufficient to cover peak natural gas consumption and ensure that the natural gas is pumped into IUGSF. IUGSF is the only functioning storage facility in the Baltic States and ensures the stability of regional gas supply. Natural gas is pumped into the storage facility in the summer season when the consumption of natural gas is lower than in the cold season to supply it to the consumers in Latvia, Estonia, Northwest Russia, and Lithuania in the heating season. IUGSF provides an opportunity to supply consumers in Latvia with natural gas without any influence from short term changes in the demand for natural gas in other countries. It is important to use the existing infrastructure efficiently, therefore IUGSF plays a key role in Latvia and requires further modernisation with the aim of making the storage facility more flexible to provide the market with the necessary products and ensure secure operation of the facility.

[112] http://www.ast.lv/sites/default/files/editor/Gada_parsk_2017_parakstits_Final_print_arvaku_.pdf

Figure 6. Natural gas transmission system in Latvia[113]

The EU in general is still highly dependent on natural gas supplies from third countries. Except for Lithuania and Estonia, Latvia's natural gas supply system is not directly connected to any other systems of the EU Member States. Along with the opening of Klaipeda Liquefied Natural Gas Terminal, however, there is physical access to natural gas not only from Russia but also from other countries. Meanwhile, considering the actual regasification capacity between the Baltic States and the Terminal as well as the possible extension of the delivery periods for natural gas shipments in the case of high demand or adverse weather conditions, it is essential to take into account the possible delivery restrictions for natural gas that can occur during the heating season. Therefore it is important to continue to realise investments in infrastructure development also in the future when the current infrastructure projects are completed.

2.4.2.2. Key planned future infrastructure projects

Pļaviņas HPP spillway project. Pļaviņas HPP with ten hydroelectric sets and an installed capacity of 897 MW is one of the biggest production capacity reserves in the Baltic States with a possibility of instantly releasing the generation capacity. Nevertheless, it has been concluded that the existing capacity of the spillway is insufficient for addressing the possible consequences of maximum flooding within 10,000 years and the danger for the security of reservoir dams. A solution for this is a Pļaviņas HPP spillway project — a structure next to the existing Pļaviņas HPP with the total length of 1,121 m and four separate canals (each canal approximately 11 m high and 9 m wide). The backup spillway includes the following structures: a feeding canal, a dam, a channel, a stilling basin, and a draining canal. The expected flow rate of the dam is 4,000 m3 per second during the potential maximum flooding. The dam will be designed as a single block with a length of 54 m in the direction of the flow and 56 m across the flow.

2.4.3. Market integration

2.4.3.1. National objectives regarding other aspects of the internal energy market

Electricity users continued to optimise the connection capacity — the efficiency of using the connection capacity has increased by an average of 7.5 %. The total capacity required by the users at the end of a nine-month period in 2018 was 11,082 MWA, which was 217 MWA or 1.9 % less compared to the capacity required at the beginning of 2018. Since May 2016,

[113] http://www.conexus.lv/uploads/filedir/parvades_operatora_zinojums_2018.pdf

when PUC approved changes in the tariffs of AS Sadales tīkls, more than 42,000 new applications for changing the connection capacity have been received and over 14,000 users with a consumption of 0 to 120 kWh/year have terminated their contracts. 1,473 users have used the opportunities of the transition period for introducing tariff changes and have completely or partially restored the capacity in the amount of 123,398 kW. Activities involving new connections and the increase of the connection load are implemented according to the Decision No 1/7 of the Council of PUC of 27 March 2018 "System Connection Regulations for the Participants of the Electricity System". The service of reducing the connection capacity is free of charge.

2.4.3.2. National objectives regarding non-discrimination of renewable energy participants

There are no specific prohibitions for any specific technology or type of RE, but there are restrictions regarding the location of the technologies and their compliance with environmental, biodiversity, societal, or territorial conditions. According to Section 8^2 of the Law On Pollution, storage of carbon dioxide in geological formations, as well as in the water column is prohibited in the territory of Latvia, the exclusive economic zone and continental shelf thereof.

2.4.3.3. National objectives regarding consumer participation

AS Sadales tīkls is continuing to install smart electricity meters in the framework of developing a smart grid based on digital technologies. A gradual expansion of the smart grid will reduce the costs of servicing and maintenance of electricity meters and ensure that the information on consumption, load, and interruptions in the electricity grid is available quickly, at any time, and from any location.

For the benefit of consumers, Section 30^1 of the Electricity Market Law introduces an electricity net payment system for micro generators in force since 1 January 2014 for all households that produce electricity for own consumption using RES. For example, if solar panels or wind power plants are used, it is possible to perform net accounting or to transfer the electricity produced to the electric network and use it when it is necessary. It is a convenient way for households to use the electricity produced whenever it is necessary within the accounting year. For example, during summer when electricity consumption reduces and solar panels operate at maximum capacity, it is possible to store the electricity for winter months when consumption increases significantly. Consumers use micro generators to produce energy from solar panels.A micro generator is an electricity generator and related protection and conversion devices (inverter) for producing alternating current with the electric current of up to 16 amperes intended to be installed in the electrical installation of the customer for parallel work with a low-voltage distribution network. It corresponds to the power of 3.7 kW in a single-phase network and 11.1 kW in a three-phase network. The process of connecting micro generators takes place according to the Decision No 1/7 of the Council of PUC of 27 March 2018 "System Connection Regulations for the Participants of the Electricity System".

Since 2012, the Ministry of Economics has issued about 600 permits for introducing new electricity generators, mostly micro generators with a power from 0.0035 MW to 0.1 MW.

2.4.3.4. National objectives regarding adequacy of the electric system

In 2018, the transmission system operator of Latvia performed an electricity and electric power balance projection, as well as an electricity consumption projection with three possible scenarios:

Scenario A "Conservative development": the projection of the load of the electricity system is based on the information submitted by the distribution system operators of Latvia regarding

the development of load and electricity consumption. The projection of the development of the generation capacity is planned based on the work of gas fired power plants under market conditions mainly working in a cogeneration mode in winter. The conservative scenario includes the development of wind power plants, biomass and biogas power plants, small gas cogeneration power plants, and solar power plants under a condition that the development rate of each generation source in Latvia can be influenced by possible changes in the state aid scheme. Due to MPC changes, Rīga CHPP-1 will be decommissioned in 2021 and is not included in the power balance, and the development of Imanta CHPP is also planned to be terminated in the middle of 2021.

Scenario B "Baseline scenario": the projection of the load of the electricity system is based on the GDP growth projections for Latvia issued by the Ministry of Economics, participants of the system from various energy sectors, as well as the information submitted by the distribution system operators of Latvia regarding the development of load and electricity consumption. The projection of the development of generation capacity takes into account power plants that are planned to be put into operation or shut down according to the information of all users of the electricity system submitted to the transmission system operator. Under the baseline scenario (B), the production capacity of HPPs of the Daugava and CHPPs of Rīga is planned based on the average annual power plant output. The transmission system operator assumes that Rīga CHPP-1 will continue to work after MPC changes and will contribute to covering peak load. The development of wind power plants, biomass and biogas power plants, small gas cogeneration power plants, and solar power plants is planned based on the historical development rate of each generation source in Latvia and a moderate pace of economic development in Latvia.

Scenario EU2030 "Optimistic development": the projection of the development of generation capacities and the increase of the load of the electricity system is based on the GDP growth projections for Latvia issued by the Ministry of Economics and, considering the desirable pace of generation and load development in order to reach the targets of the European Union for 2030, Energy Development Guidelines 2016–2020 of the Cabinet of Ministers of 9 February 2016 (Cabinet Order No. 129) and the informative report on the Long-Term Energy Strategy of Latvia 2030. In addition to the development pace in scenarios A and B, this scenario also takes into account potential power plants in the future, the commissioning of which according to the information available to the TSO is deemed possible. It is assumed in this scenario that Imanta CHPP and Rīga CHPP-1 retain the ability to contribute to covering peak load after MPC changes. The projections of state aid and the development of the infrastructure of the transmission system in this scenario predict a more vigorous development of wind, solar, biomass and biogas power plants for RE producers.

The analysis of the generation capacity for future years in the conservative scenario (A) suggests that the generation capacity is sufficient only for 2018 and is not enough to cover peak load, ensure spare capacities, and fulfil system regulation and safety requirements for winter months in the remaining period. The conservative scenario (A) provides for a very slow development of the Latvian electricity system, slow pace of economic development due to changes in the state aid mechanism for renewable energy and cogeneration power plants, therefore the operation of natural gas power plants, including Rīga CHPP-1 and Rīga CHPP-2, will be less competitive and less efficient in a free energy market. It is assumed in this scenario that Rīga CHPP-1 will be decommissioned in 2021 and will not contribute to ensuring the power balance due to the possible change or reduction of the state aid mechanism for RE and cogeneration producers in the framework of the mandatory procurement component (MPC). Commissioning of Imanta CHPP will also be suspended in the middle of 2021. The generation deficit in the conservative scenario (A) according to generation development trends reaches 23 % by 2023 and 28 % by 2028. It is planned that 55 MW of the

total net capacity of wind power plants by 2028 could be covered by offshore wind farms, the actual development pace of which is difficult to predict due to ambiguity in the legislation governing the mechanism. Considering the slow development of wind power plants, it is assumed in the conservative scenario (A) that the development of offshore wind farms will not start until 2023 (minimum time for constructing a wind farm — 5 years, research and time for receiving national permit for constructing an offshore wind park — 2 years). Generation adequacy in the entire period analysed (2018–2028) ranges from 62 to 100 %, which suggests that the generation capacity is insufficient to cover the electricity consumption and the generation deficit will increase from 0 MW to 587 MW over the entire period. The conservative scenario (A) shows that it is extremely important not to lose/cut back the existing base generation sources (HPPs of the Daugava, Rīga CHPP-1, Rīga CHPP-2, Imanta CHPP) in order to ensure the electricity balance in the electricity system of Latvia. Electricity production in the conservative scenario (A) is based on Rīga CHPP-1, Rīga CHPP-2, and Imanta CHPP working according to free energy market conditions when power plants are less effective and can produce only a fraction of the maximum output in a situation of free competition. Electricity deficit in the electricity system of Latvia according to the conservative scenario (A) ranges from 895 GWh to 1,734 GWh.

According to the baseline scenario (B), the electricity system of Latvia can reach peak load from 2018 to 2022 and the generation deficit increases over time (2–19 %). Just like in the conservative scenario (A), it is important in the baseline scenario (B) not to lose/cut back the existing base generation sources (HPPs of the Daugava, Rīga CHPP-1, Rīga CHPP-2, Imanta CHPP). It is assumed in the baseline scenario (B) that the development of offshore wind parks might begin gradually starting from 2023 after stage three of the Kurzeme Ring is put into operation and the first wind turbines on the shore of the Baltic Sea could be connected to it. Moreover, wind power plants will develop at a higher pace than in the conservative scenario (A). Electricity supply in the baseline scenario (B) will not be sufficient in the entire period analysed (87–92 %), which means that Latvia will import the electricity from the neighbouring countries in order to ensure the electricity balance. It is assumed in the baseline scenario (B) that Rīga CHPP-1 and Rīga CHPP-2 operate based on the free market principles (Nord Pool power market) and electricity output is based on the average multiannual amount. As the share of wind power plants in the energy system of Latvia will increase in the baseline scenario (B), the need for a regulating reserve will also slightly increase.

According to the optimistic scenario (EU2030), Latvia can reach peak load from 2018 to 2024 (105–115 %) and the generation deficit increases (from 6 to 10 %) starting from 2025 when synchronous operation with the continental European network is planned to commence. Generation surplus from 2018 to 2024 indicates that power exports to the neighbouring countries is possible in order to help cover peak loads of the electricity systems of the neighbouring countries. It is assumed in the optimistic scenario (EU2030) that the development of offshore wind parks might start gradually from 2022. The use of the development of wind turbine technologies allows to produce wind turbines with the installed capacity of 8 MW already in 2018, with more rapid development of these technologies expected in the future. Electricity supply in the optimistic scenario (EU2030) will be sufficient in the entire period analysed (151–152 %), which means that Latvia will not be required to import the electricity from the neighbouring countries and will be able to export to the neighbouring countries. It is assumed in the optimistic scenario (EU2030) that Rīga CHPP-1, Rīga CHPP-2, and Imanta CHPP operate outside the free market principles and Nord Pool power market, and can produce maximum output to ensure security of the electricity system and energy supply in Latvia according to the annual repair schedule for each power plant. As the share of wind power plants in the energy system of Latvia will increase in the optimistic scenario (EU), the need for a regulating reserve will also increase.

It is not planned to put into operation any new base power plants by 2028 and no decisions about implementing any major power plant projects (including with regard to the increase of the base electric power) in the Baltic States by 2028 have been made by the end of 2018. However, it is possible that high capacity wind park projects with the installed capacity of 100 MW or more might be implemented in Latvia in the coming years.

2.4.3.5. National objectives for protecting energy consumers

Since electricity is no longer subsidised for all energy consumers after the liberalisation of the electricity market, the most vulnerable part of the society requires support in order to reduce the possible impact of increased prices. According to Section 1, Paragraph two, Clause 2 of the Electricity Market Law, a protected user is a poor or low-income family (person), a large family or a family (person) that takes care of a child with disability, or a person with group I disability who uses electricity in his or her household for his or her own needs (for final consumption) (hereinafter — protected users).

The average monthly number of protected users receiving electricity services in 2017 was 82,123 (poor/low-income persons — 49,651; persons with group I disability — 9199; large families — 20,361; families with children with disability — 2,913). According to Section 33.1, Paragraph one of the Electricity Market Law, a protected user has the right to receive the trade service of a protected user. Provision of the trade service of a protected user and compensation of the mandatory procurement component and service of the distribution system (hereinafter — service) is governed by Cabinet Regulation No. 459 of 12 July 2016 "Procedure for the Provision of the Trade Service of a Protected User and Compensation of the Mandatory Procurement Component and Service of the Distribution System" (hereinafter — Regulation No. 459) by offering vulnerable groups of society a certain amount of electricity for a reduced price (poor or low-income families (persons), families that take care of a child with disability, and persons with group I disability are offered 100 kilowatt hours of electricity for a subsidised price of EUR 0.03758) per kilowatt hour each accounting period (calendar month), large families — 300 kilowatt hours of electricity for a price of EUR 0.03758 per kilowatt hour each accounting period (calendar month), as well as compensation of the fixed price of the mandatory procurement component and the distribution system service based on the connection capacity (EUR 1.96, EUR 5.07 or EUR 0.32 per ampere (nominal electric current of the input overvoltage protection device in amperes)).

2.4.4. Energy poverty

Energy poverty is a special type of poverty related to a number of adverse effects on human health and well-being, e.g. respiratory and heart disease and mental health influenced by low temperatures and stress related to gas, heating, and electricity bills that people cannot pay. Energy poverty has an indirect impact on various quality-of-life indicators defining the well-being of households and people, including health, environment, and productivity.

Concerning consumer protection, the increase of energy poverty as well as lack of clarity about the most appropriate tools to prevent consumer vulnerability and energy poverty also prevents further integration of the internal energy market.

Regulations[114] of tenders organised within the National Research Programme *Energy* for the period from 2018–2021 were approved on 4 October 2018, with one of the regulations providing for the following:

- assessment of the situation of energy poverty in Latvia;

[114] https://www.em.gov.lv/lv/nozares_politika/valsts_petijumu_programma__energetika_/

- defining the concept of energy poverty, including the development of energy poverty criteria for Latvia;
- identification of the social group exposed to the risk of energy poverty based on the developed criteria;
- assessment of the compliance of groups of inhabitants included in the definition of a protected user with the energy poverty criteria;
- review of the analysis for the need of a protected user group.

Thus it can be concluded that the situation in Latvia regarding energy poverty will only be assessed only in 2021 after implementing the actions described above. Therefore quantified targets for reducing energy poverty and/or limiting energy poverty will be set and approved after 2021 but no later than before submitting the updated Plan in 2023. If necessary, it is also when policies and measures for implementing them will be developed in order to reach the objectives of this dimension.

2.5. Research, innovation and competitiveness

2.5.1. National targets and funding objectives

SDSL2030[115] lays down two targets in this dimension:

- turnover of innovative products — over 14 % of the total turnover;
- proportion of innovative enterprises — over 40% if all enterprises.

The NRPL2020[116] target for investments in R&D for 2020 is 1.5 % of GDP.

In order to develop the research and innovation system, the science policy is made according to the Research and Innovation Strategy of Latvia for Smart Specialisation — RIS3[117] (hereinafter — RIS3 strategy) and the targets and objectives of GDSTI2020[118].

GDSTI2020 establish the following lines of action in the area of science, technology development, and innovation:

- increasing the competitiveness of the industry;
- linking the industry with the needs of social and economic development;
- effective management of the industry;
- rising of public awareness, promotion of science and innovation.

RIS3 strategy is the national economic development strategy that defines directions of economic transformation, growth priorities, and areas of smart specialisation by providing for a targeted concentration of research and innovation resources in the areas of knowledge in which the country has comparative advantages or a basis for creating such advantages. The main direction is transformation of economy to growth driven by science and technology and moving towards science based development of skills. RIS3 strategy establishes the following areas of specialisation:

- research intensive bioeconomy;

[115] http://polsis.mk.gov.lv/documents/3323
[116] http://polsis.mk.gov.lv/documents/4294
[117] http://tap.mk.gov.lv/lv/mk/tap/?pid=40334802&mode=mk&date=2014-10-21
[118] http://polsis.mk.gov.lv/documents/4608

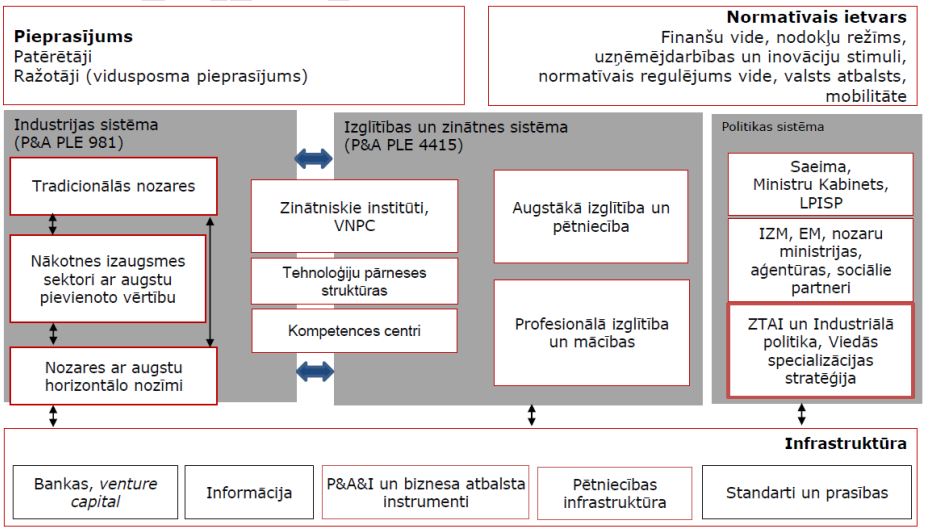
- biomedicine, medical technologies, biopharmacy, and biotechnology;
- advanced materials, technologies and engineering systems;
- smart energy;
- information and communication technologies.

One of the five priority areas of the RIS3 strategy of Latvia requiring development of research and innovation is smart energy involving innovative energy efficiency solutions and technologies, including for increasing energy efficiency, which includes creation of new materials, optimisation of production processes, introduction of technological innovations, use of alternative energy sources, and other solutions. Considering the wide scope of the energy industry, research should also be expanded in the areas of smart materials, technologies and engineering systems, and research intensive bioeconomy. Compliance with the objectives of the RIS3 strategy is one of the criteria taken into consideration when creating instruments for funding research, including organising investments from EU structural funds.

The definition of innovation approved in Latvia: "innovation is the implementation in a product or service of new ideas, developments and technologies of a scientific, technical, social, or cultural field or other fields"[119].

The National Innovation System is a coordinated set of measures implemented by the government and institutions of both public and private sectors in each country that ensures effective exchange of knowledge and skills in the society and promotes balanced intellectual and economic development of the society. The main elements of the Innovation System are:

- education;
- research (science, innovation);
- entrepreneurship;
- financial system;
- regulatory framework.



[119] National Industrial Policy Guidelines 2014–2020

Figure 7. National Innovation System of Latvia[120]

2.5.2. Objectives for promoting clean energy technologies for 2050

Energy supply over the coming decades will substantially and fundamentally differ from the way it has been organised until now. In order to reduce the impacts of climate change, according to the Paris Agreement it is necessary to limit the temperature growth, which requires significant reduction of the fossil fuel energy consumption. It is predicted that by 2050 energy production will be sustainable, buildings will be energy-efficient, company production processes will be optimised, natural gas will not be used for preparing food, and the majority of cars will be electric.

In order to reduce the use of fossil energy sources to the extent possible, including by gradually decreasing natural gas consumption and supply, it is necessary to promote the development and introduction of innovative clean energy technologies, especially for the energy performance of buildings, production, and transport.

LCDS2050 informative report, which is still under development, provides for the following key conditions in the area of research and development of low carbon technologies:

- low carbon development aspects are included in all research programmes, a mandatory condition for the ones funded by the state budget;
- Latvia effectively attracts foreign and private investments for research, development of innovative solutions, and creation of new and advanced technologies and processes;
- close connection of education and research as well as knowledge and technology transfer between research and various economic sectors.

2.5.3. Where applicable, national objectives with regard to competitiveness

With regard to competitiveness, SDSL2030[121] lays down the national objective — Latvia has to take at least 40th place in the Global Competitiveness Index by 2030.

[120] Latvian School of Public Administration
[121] http://polsis.mk.gov.lv/documents/3323

3. POLICIES AND MEASURES

Since many policy measures of Latvia required for meeting the objectives are cross-sectoral measures and almost all of the measures by nature are related to the conditions for climate change mitigation, all the possible measures required for meeting the objectives are summarised in Annex 4.

It should be noted that the measures below that could be classified as support for commercial activities have to be harmonised with the EC and this harmonisation has to be done in a timely manner. Therefore the measures that are classified as support for commercial activities will be implemented according to the commercial activity support control regulation, while the measures that are to be harmonised with the EC from the perspective of support for commercial activity will be harmonised before their implementation.

A number of measures specified in Annex 4 have already been included in the baseline scenario under the assumption that they will continue in the period after 2021[122] according to the Plan. Specific conditions for their implementation in the specified period have not yet been laid down in the policy planning documents of Latvia and the funding required for their implementation has not been provided. However, they are included in several draft documents, e. g. documents about the multiannual budget and the new framework of EU funds. Therefore these measures are included in the baseline scenario as potential new measures and the funding required for their implementation is shown in the table below as a funding required for meeting the objective.

The funding for measures specified in Annex 4 and the necessary investments will be specified in discussions about the reallocation of support from EU funds. Moreover, the funding required for implementing the measures specified in Annex 4 is not final and its allocation has not been approved.

The order of priority in the implementation of the measures is not established and approved, but priority should be given to the sectors that are the largest energy consumers and produce the amounts of GHG emissions that are subject to the GHG reduction target for non-ETS activities in Latvia. The largest consumers of energy in 2017 were transport with 30.3 % and households with 29.2 %, while the leaders in GHG emissions from non-ETS activities in 2017 were transport with 36.3 %, agriculture with 28.5 %, and energy with 17 %. Annex 4 of the draft Project outlines potential measures for meeting the objectives by 2030. The measures are divided into several groups:

1) support programmes of European Union funds;
2) tax policy measures;
3) promotion measures;
4) legislative measures;
5) obligations.

[122] Or after 2023, as the implementation deadline for many measures implemented within the support programmes of EU funds is 2023

3.1. Decarbonisation

3.1.1. GHG emissions and removals

3.1.1.1. Policies and measures for meeting the objectives

See Annex 4.

……

3.1.1.2. Regional cooperation

……

3.1.2. Renewable energy

3.1.2.1. Policies and measures for fulfilling the contributions

See Annex 4.

The measured and policies for fulfilling the renewable energy contribution summarised in Annex 4 have the following lines of action:

1) development of legislative provisions to promote the implementation of RE technologies without direct financial support;
2) review of tax rates to promote the ability of RES to compete with fossil energy sources;
3) attraction of funding, including through cross-border cooperation and RE technology projects;
4) promotion of own consumption of energy.

There are currently several **measures being implemented** according to the current policies and not as policy implementation measures, the implementation of which will promote the increase of the share of RE:

- SIA Salaspils siltums project for the use of solar energy in district heating by producing 12 GWh of heat annually and completely covering the consumption of heat during summer with the solar energy[123];
- establishment of a facility for anaerobic digestion of biodegradable waste in two landfills, which will ensure recycling of biodegradable waste through composting as well as energy production from the biogas generated in the recycling process;
- a plan for reuse, recycling, and recovery of waste in Ventspils involving the establishment of a recovery facility for fuel produced from waste or a district heating facility that uses fuel produced (or recovered) from municipal waste. It is planned that the nominal production output will be 10 MW with 8 MW of heat and 1.3 MW of electricity produced. The fuel will be produced from waste in the amount of up to 21,210 tonnes per year. The launch of the facility is scheduled for the second half of 2020.

  A waste-to-energy plant in Ventspils, where the fuel used for district heating in 2018 was diesel, coal, and solid biomass (wood chips), can ensure the transition to the use of biomass fuel, as the biodegradable fraction (biomass fraction) in municipal waste can amount to 30–

[123] https://www.salaspilssiltums.lv/lv/jaunumi/527-sia-salaspils-siltums-veiksm%C4%ABgi-turpina-projekta-nr-4-3-1-0-17-a-061-%C4%ABsteno%C5%A1anu.html

50 %[124], which is considered to be RE where the amount of CO_2 generated during incineration is not included in the total amount of GHG emissions of a country[125].

There is information about several **measures to be implemented** that have not been started yet and have not been included in policy planning documents but could potentially be implemented:

- AS Latvenergo pilot project of wind power plants;
- implementation of the project of Dobele Wind Park by increasing the production capacity of renewable energy by about 200 MW;
- a project of the second generation bioethanol production plant in Bauska where about 50 thousand tonnes of bioethanol will be produced from about 300 thousand tonnes of straw, with production scheduled to start in 2022.

3.1.2.2. Regional cooperation

One of the possibilities of regional cooperation in the promotion of decarbonisation are transnational cooperation projects in the area of producing renewable energy, e.g. development of wind energy. In order to implement it, it is necessary that the Baltic States interested in this cooperation consolidate this cooperation in a policy planning document (establish it as a policy) and then include this cooperation in the conditions for the spatial planning by harmonising and expanding them.

3.1.2.3. Support for electricity produced from RES

In order to promote electricity production from RES and high efficiency cogeneration, a support instrument used by Latvia until the submission of the draft Plan to the EC is the mandatory procurement of electricity and a charge about the electric power of the electric power plant.

In order to prevent a sharp increase of the MPC and thus the electricity price, the following actions have already been carried out before submitting the draft Plan to the EC:

- no new rights to sell the electricity produced within the mandatory procurement have been granted since 2012;
- the initial MPC is fixed at 26.79 EUR/MWh, which is also included in the declarations of governments from the recent years, and as of 1 July 2018 the MPC is fixed at 22.68 EUR/MWh;
- a state aid mechanism for energy intensive manufacturing companies has been created;
- overcompensation of power plants has been prevented by establishing the total maximum internal rate of return of capital investments in the amount of 9 %;
- the MPC is differentiated by connection capacity as of January 2018.

Along with the changes in MPC funding (differentiation), which entered into force on 1 January 2018 with amendments to the Electricity Market Law, the payment of MPC is divided into two parts — by energy consumption and by the required connection capacity. The introduction of the new model ensures a competitive electricity price in the European region for energy intensive manufacturing companies, thus promoting the impact of the MPC on the changing production costs of the manufacturing industry and stimulating competitiveness of the industry sector in the long term. Differentiation of the MPC also promotes the development of industry in less energy-intensive sectors. In general, the new MPC model reduces the MPC payment for consumers that use the connection capacity effectively.

The Ministry of Economics together with sectoral ministries and stakeholders is currently working on complex measures for lifting the MPC and developing the electricity market.

[124] http://www.vvd.gov.lv/filedownload?tabula=Document&id=122216&filename=EMISIJA-2017.7z
[125] https://www.ipcc-nggip.iges.or.jp/public/2006gl/

3.1.2.4. Points of contact

According to the Proposal for amending Directive 2009/28/EC, Latvia has to establish a point of contact for RE by 2021, which the potential or the current developer of a renewable energy project can refer to if he or she wants to start or has already started to implement a RE technology project. This point of contact is the main "one-stop-shop" in Latvia regarding the issues of RE, including in relation to issuing all permits and decisions required. This point of contact also ensures mediation in communication between all other national regulatory authorities and the specific developer of the RE technology project.

There is currently no specific point of contact in Latvia regarding these matters. This point of contact will be established in 2019–2020.

3.1.2.5. Assessment of the need to build new infrastructure

In the baseline scenario, Latvia can reach the share of RE of about 41 % in the total final energy consumption. In order to increase the share, Latvia might need to install additional capacities for producing RE to replace fossil energy capacities.

To be updated in the final version of the Plan.

3.1.2.6. Promoting the use of energy produced from biomass

The fuel dominating in the total primary energy consumption (excluding electricity) in Latvia in 2017 was biomass (solid, gaseous, and liquid) with the share of 37.9 % of the biomass fuel in the total primary energy consumption and the share of 34.3 % of biomass fuel consumption in the total final consumption of fuel.

It is estimated in the baseline scenario that the increase of solid biomass in the final energy consumption will increase by 13.3 % by 2030 (compared to 2015), therefore it is not planned to significantly increase the amount of solid biomass production to ensure the domestic consumption of solid biomass in the energy sector.

However, in order to fulfil the contribution of Latvia to the share of RE, Latvia has adopted measures for promoting the use of biomass in the production of electricity and heat (see Annex 4).

To be updated in the final version of the Plan.

3.1.3. Other elements of the dimension

3.1.3.1. Policies and measures regarding ETS

Enforcement of the target is the responsibility of the EC. In order to meet this target, conditions for the operation of ETS and the responsibilities of ETS operators have been approved by EU legislation. GHG emission reduction measures for ETS operators are established in Directive 2003/87/EC[126] and the development and implementation of these measures is ensured by the EC together with the EU Member States by complying with the requirements and conditions laid down by Directive 2003/87/EC.

ETS participants in Latvia are operators who have received GHG emission permits according to the Law On Pollution in accordance with Cabinet Regulation No. 769 and who are performing activities specified in Part II of Annex 2 to the Law On Pollution. The share of GHG emissions produced by the Latvian ETS operators in the total amount of GHG emissions is the second lowest among the Member States — 19.43 %.

[126] Directive 2003/87/EC

There were 67 ETS facilities of 47 Latvian operators in 2016, among them heat producers (private entrepreneurs as well as national and municipal companies) as well as various industrial manufacturers, e.g., wood processing companies, cement producers, metallurgy, etc. Regarding facility operators in 2016, it can be indicated that the amount of emissions was 2,197,000 tonnes of carbon dioxide from the ETS operators of stationary facilities and the operators received 1,893,129 emission allowances free of charge within the allowance scheme. The operators have to surrender one emission allowance per each tonne of CO_2. However, it is important to note that the situation of each operator is different, which is influenced by various factors, e.g. the specific sector, historical production data used for the initial calculation of allowances, technologies used, fuel, as well as emission allowances accumulated. Thus the surplus or deficit of emission allowances for various operators can form differently.

3.1.3.2. Policies for reaching other targets

GPP is a process in which national and municipal authorities try to purchase goods and services with the lowest possible impact on the environment considering the life cycle costs of goods and services with the same primary function. This helps:

- to reduce impact on the environment — each product or service bought has an impact on the environment in all stages of the life cycle (production → use → recycling, recovery or reuse, or landfilling);
- to promote social improvements — with the help of conditions included in the procurement procedure it is possible to ensure better working conditions, e.g. reduction of the content of toxic chemical substances in cleaning products improves living and working conditions, transport with reduced emissions promotes the improvement of air quality and reduces the risk of developing respiratory disease;
- to achieve savings in the budget — when planning to purchase a product or a service, real needs are assessed first to reduce the scope of procurements. Secondly, an assessment of the costs of the life cycle of a product is made. This allows to take into consideration all the factors (not only the initial price of a product or a service, but also operating costs and the costs of managing the waste produced) and achieve savings as a result.

The procedure for applying GPP in Latvia is laid down by the Public Procurement Law and the Law on Procurement of Public Service Providers as well as Cabinet Regulation No. 353 of 20 June 2017 "Requirements for Green Public Procurement and the Procedure for their Application".

To ensure compliance with the requirements and criteria of green public procurement in construction procurements, measures aimed at increasing energy efficiency and climate change mitigation have to be implemented. The measures to be implemented are described in the annexes of said Cabinet Regulation by determining the groups of products and services the green public procurement shall be applied to mandatory and optionally[127]. GPP application guidelines describe the measures to be implemented and the methods for assessing compliance in more detail[128].

3.1.3.3. Policies and measures to achieve low emission mobility (including electrification of transport)

See Annex 4.

In addition, the Ministry of Transport is commissioning a study by the end of 2018 to assess the scenario for implementing the infrastructure of alternative fuels (electricity, CNG, LNG,

[127] https://likumi.lv/ta/id/291867-prasibas-zalajam-publiskajam-iepirkumam-un-to-piemerosanas-kartiba
[128] http://www.varam.gov.lv/lat/darbibas_veidi/zalais_publiskais_iepirkums/?doc=22769

hydrogen, biofuels, synthetic and paraffinised fuels produced from RES) and its socioeconomic effects.

To be updated in the final version of the Plan.

3.1.3.4. Policies for phasing out energy subsidies

See Annex 4.

According to the information about subsidies provided by the EC, measures such as tax credits, tax exemptions, direct payments (grants, loans), and indirect payments (capacity mechanisms) are also regarded as subsidies.

In 2017, the Cabinet of Ministers[129] approved the proposals for the development of legislation to eliminate reduced excise duty rates applied to biofuels and biofuel and fossil fuel mixtures with high biofuel content (E85 and B100). Therefore amendments to the Law On Excise Duties are developed in order to lift reduced excise duty rates for E85 and B100 fuels. Amendments to the law provide for abolishing the reduced excise duty rate for the E85 fuel, thus establishing that the new rate per 1,000 litres of fuel to be EUR 360 instead of EUR 142.8. For the fuel B100, which is currently exempt from the excise duty, it is proposed to impose a duty in the amount of EUR 330 per 1,000 litres. The amendments also propose a flat rate of EUR 60 per 1,000 litres for petroleum products used as fuel regardless of the amount of biofuel added. It is also proposed to introduce a minimum excise duty rate of EUR 21 per 1,000 litres of rapeseed oil, biodiesel completely produced from rapeseed oil.

There is currently ongoing work on the electricity produced from RES or in high efficiency cogeneration facilities and the improvement of the mandatory procurement system with the aim of providing further support based on the principles of electricity wholesale.

To be updated in the final version of the Plan.

3.2. Energy efficiency

3.2.1. Policies and measures for fulfilling the contributions

See Annex 4.

The measures and policies planned in order to reach the optional national objective — Latvia's contribution to the energy efficiency target of the EU — and the mandatory national energy efficiency objective, which are summarised in Annex 4, have the following major lines of action:

1) implementation of the support programmes of EU funds — continuing the existing programmes and starting the implementation of new support programmes in order to promote and financially support the implementation of energy efficiency measures in multi-apartment buildings, national and municipal buildings and industrial production, as well as creation of support mechanisms for private houses and cooling;

2) review of tax rates in order to promote reduction of energy consumption and change of habits of inhabitants and economic operators with the aim of improving energy efficiency and ensuring energy savings;

3) review and enhancement of construction standards considering the requirements of Directive 2010/31/EC and the need to ensure that renovated buildings consume the least

[129] Cabinet Order No. 379 of 21 July 2017 "On the Conceptual Report "On the Use of Renewable Energy Sources in the Transport Sector""

amount of energy possible and new buildings are constructed as nearly zero-energy consumption buildings;

4) broadening the scope of the EEOS by including the largest energy traders to promote their involvement in the reduction of energy consumption by their customers.

Several support programmes co-financed by the EU funds are being implemented within the framework of the 2014–2020 programming period for EU funds. Implementation of these programmes is included in the baseline scenario also after 2021 based on the assumption that implementation of these programmes will continue after 2020 in the same intensity as in 2020. However, since implementation conditions for these programmes in the period after 2021 have not been established in the policy planning documents or legislation of Latvia and the funding required for implementing them has not been defined as available or granted, these programmes are potential new measures and the funding required for the implementation of these measures is the additional funding required for reaching the objective.

3.2.1.1. DH energy efficiency programme

DH energy efficiency programme is implemented in the framework of the specific support objective 4.3.1 "To promote energy efficiency and use of local RES in district heating" of the Operational Programme "Growth and Employment" of the 2014–2020 programming period for EU funds in two project submission rounds[130].

The total funding of the project is estimated at EUR 150 million with co-financing from the CF in the amount of EUR 60 million, and it is planned to continue the programme also in the 2021–2027 programming period for EU funds as it makes a substantial contribution to improving and modernising the DH system of Latvia and increasing energy efficiency.

Indicative implementation of these programmes in the current intensity is planned according to the baseline scenario for the period after 2021. It is planned that in the 2021–2027 programming period for EU funds the support for creating and improving DH and cooling systems would be covered by co-financing from the CF.

3.2.1.2. District cooling programme

In the 2021–2027 programming period for EU funds it is planned to develop a support programme for creating a district cooling system, which is a substantial part of public buildings. So far there have not been any support programmes for such investments.

Regulations[131] of tenders organised within the National Research Programme *Energy* for the period from 2018–2021 were approved on 4 October 2018, with one of the regulations providing for the development of knowledge base in the area of energy efficiency by including a comprehensive assessment of the potential of energy efficiency in economic sectors and certain fields, assessment of energy efficiency measures, research of new engineering solutions, assessment of the potential of developing efficient heating and cooling systems in Latvia, as well as development of respective policies and funding solutions.

[130] All the information related to the programme, including the initial assessment of the DH system with indicators reached within the programmes implemented before and the funding attracted, as well as Cabinet Regulations governing the programmes and criteria for assessing project submissions:
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitati_un_vietejo_aer_izmantosanu_centralizetaja_siltumapgade/
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitati_un_vietejo_aer_izmantosanu_centralizetaja_siltumapgade__ii_karta_

[131] https://www.em.gov.lv/lv/nozares_politika/valsts_petijumu_programma__energetika_/

3.2.1.3. Increasing the energy performance of industrial buildings

Support for increasing the energy performance of buildings, including improvement of energy performance of buildings and their engineering systems and increasing energy efficiency of production equipment or replacement with more efficient equipment, is provided in the framework of the specific support objective 4.1.1 "To promote efficient use of energy sources, reduction of energy consumption, and transition to renewable energy in the manufacturing industry"[132], and this is the only support programme that provides grants to economic operators for implementing energy efficiency measures. The total funding of the programme is estimated at EUR 85.5 million with co-financing from the CF in the amount of EUR 25 million.

The programme provides contribution to reaching national energy efficiency targets and is one of the tools for economic operators to successfully comply with the requirement of the Energy Efficiency Law to perform an energy audit or introduce an energy management system in the company and to implement at least three measures for improving energy efficiency. In the framework of the support programme, a company is eligible for support in the form of a grant for implementing the respective energy efficiency measures.

The Ministry of Economics is also planning to implement a similar energy efficiency programme for economic operators in the 2021–2027 programming period indicatively co-financed by the CF. The type of support (grant, financial instrument) provided to the economic operators will be assessed. Indicative implementation of these programmes in the current intensity is also planned according to the baseline scenario for the period after 2021.

3.2.1.4. Promoting the increase of energy efficiency and the use of RE in municipal buildings according to the development programmes integrated by local governments

With the aim of reducing primary energy consumption of municipal buildings by promoting the increase of energy efficiency and reduction of local government spending on heating and by investing in municipal buildings according to the priorities established in local government development programmes, projects of the specific support objective 4.2.2 "To facilitate the increase of energy efficiency and use of RES in municipal buildings in accordance with the integrated development programmes of local governments"[133] of the Operational Programme are implemented in the 2014–2020 programming period. In the framework of these projects with the total funding of approximately EUR 55.3 million and co-financing from ERDF in the amount of about EUR 47 million it is planned to do the following in public (municipal) buildings by 31 December 2023:

- to reduce the annual primary energy consumption by at least 20,536,239 kWh;
- to reduce the estimated annual GHG emissions by about 5,180 t CO_2 eq.;
- to achieve additional RE capacity of at least 1.8 MW.

Indicative implementation of these programmes in the current intensity is also planned in the baseline scenario for the period after 2021 and until 2030, whilst improving project implementation feasibility studies, including by developing a database of municipal and national buildings or geospatial information to acquire complete information about the functions of municipal and national buildings and their intended use before implementing the projects.

[132] All the information related to the project, including the initial assessment that is harmonised with the EC, Cabinet Regulations governing the programme and criteria for assessing project submissions, is available on the Web page of the Ministry of Economics:
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_efektivu_energoresursu_izmantosanu__energijas_paterina_samazinasanu_un_pareju_uz_aer_apstrades_rupniecibas_nozare/
https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_efektivu_energoresursu_izmantosanu__energijas_paterina_samazinasanu_un_pareju_uz_aer_apstrades_rupniecibas_nozare__ii_karta_/

[133] https://www.cfla.gov.lv/CFLA2/item.php?itemID=40

3.2.2. Energy efficiency obligation scheme

Setting up of the energy efficiency obligation scheme is laid down by Article 7 of Directive 2012/27/EU, and energy distributors, retail energy sales companies, and transport fuel distributors or transport fuel retailers shall be designated as obligated parties to the EEOS. The scope of the EEOS is determined by each Member State.

The companies that are designated as obligated parties and operating in the territory of each Member State shall reach the target of cumulative final energy consumption savings of 0.8 % in the period from 1 January 2021 to 31 December 2030. The total mandatory energy savings target shall be split among the obligated parties.

In order to ensure that the target is reached, the obligated parties shall introduce energy efficiency measures every year in any of the final consumption sectors and achieve new savings according to the targets set for them. The obligated parties (companies) shall prove to the authority managing the EEOS that the respective energy savings have been achieved. The obligated parties shall submit an annual report containing information about the measures implemented and the calculations of energy savings, as well as summarised data about their final consumers and their consumption.

Apart from building insulation, the obligated parties can implement the following energy efficiency measures in any of the final consumption sectors:

- installation of heating regulators and meters in apartments and informing consumers about heating regulation;
- installation of solar collectors for heating premises and water;
- installation of heat pumps;
- installation of more energy efficient boilers;
- installation of heat recovery systems;
- replacement of electrical appliances (refrigerators, electric stoves, etc.);
- replacement of light fittings;
- introduction of automatic lighting control systems;
- replacement of electric motors, pumps, and other devices;
- implementation of the energy management system (ISO 50001);
- ESCO services;
- etc.

If a country has established an energy efficiency fund, the obligated parties can perform their obligations by contributing to the fund the amount that is equal to the investments that would be required in order to implement the measures specified.

Potential participants of the EEOS and the structure of its final users

The EEOS in Latvia was established by the Energy Efficiency Law and has been operating since 2016. The EEOS currently includes energy retailers with the amount of electricity sold in 2016 of at least 10 GWh and the annual amount of electricity sold in the period until 31 December 2020 of at least 10 GWh.

Considering the current situation regarding the fulfilment of energy efficiency targets for the period until 31 December 2020 and the assessment of the efficiency and contribution of the

current EEOS to the national target, the EEOS in Latvia should be expanded, as it is laid down by the Energy Efficiency Law.

There are several options considered for expanding the EEOS with the following scope and conditions of the EEOS:

Option 1

- The obligated parties to the EEOS are all the energy traders who collectively supply 90 % of the total amount of energy supplied to the consumers in Latvia.
- The amount of energy sold by the party to the voluntary agreement is excluded from the amount of energy supplied to consumers.
- The obligation is calculated based on the amount of energy sold. Large consumers and large enterprises are not excluded.

Option 2

- The obligated parties to the EEOS are:
  - electricity traders with the annual amount of electricity sold of 10 GWh;
  - gas traders with the amount of natural gas supplied to final consumers exceeding 1,000 GWh/year;
  - transport fuel traders with the amount of fuel (fossil fuels and biofuels) supplied exceeding 40,000 m3;
  - traders of thermal energy with at least one facility with a thermal input of 20 MW connected to their system and the amount of heat supplied exceeding 20 GWh/year.

Division of obligations in the EEOS

Savings targets for the division of obligations have to be divided between the obligated parties (companies) of the respective sectors. In order to divide the obligations, a combination of criteria like the number of the final energy users or the amount of energy sold is used. The obligated parties to the EEOS are directly related to their customers — energy consumers — and know their habits of energy consumption. In order to achieve the energy savings calculated, implementation of energy efficiency measures can be done by the obligated parties themselves or their subcontractors, or they can hire companies (e.g. ESCO) that can implement energy efficiency measures. The obligated parties can implement energy efficiency measures not only with their consumers but also with any other final energy consumer. The obligated parties can implement energy efficiency measures by several parties cooperating and implementing the measures jointly with the final energy consumers of all the parties or the final energy consumers of another obligated party or a group of obligated parties.

The EEOS is also linked to the national energy efficiency fund that aims to support national initiatives in the area of energy efficiency. According to the Energy Efficiency Law, Latvia has established that the obligated party to the EEOS can perform its obligation by making contributions to the national or municipal energy efficiency fund in the level corresponding to the final energy consumption savings it has to achieve. The level of obligation of the obligated party shall be reduced in proportion to the amount of contributions made. The state or the local government that has received the contribution ensures energy savings according to the level of obligation of the obligated party it has made contributions about. It is planned that this principle will also be observed in the period from 2021 to 2030.

3.2.3. Long-term renovation strategies

Several support programmes co-financed by the EU funds are currently being implemented within the framework of the 2014–2020 programming period for EU funds. Implementation of these programmes is included in the baseline scenario also after 2021 based on the assumption that implementation of these programmes will continue after 2020 in the same intensity as in 2020. However, since implementation conditions for these programmes in the period after 2021 have not been established in the policy planning documents or legislation of Latvia and the funding required for implementing them has not been defined as available or granted, these programmes are potential new measures and the funding required for the implementation of these measures is the additional funding required for reaching the objective.

3.2.3.1. Increasing the energy performance of buildings owned by the state and multi-apartment buildings

The Operational Programme "Growth and Employment" with the specific support objective 4.2.1 "To promote the increase of energy efficiency in public and residential buildings" and measure 4.2.1.2 "To promote the increase of energy efficiency in public buildings"[134] for the period until 2020 is designed to comply with the requirement of Article 5(1) of Directive 2012/27/EU that 3 % of the total floor area of heated and/or cooled buildings owned and occupied by the central government is renovated each year to meet at least the minimum energy performance requirements.

The Operational Programme "Growth and Employment" with the specific support objective 4.2.1 "To promote the increase of energy efficiency in public and residential buildings" and the measure 4.2.1.1 "To promote the increase of energy efficiency in residential buildings"[135] for the period until 2020 is designed to promote the increase of energy efficiency and the use of smart energy management and renewable energy in multi-apartment buildings.

Both programmes are supported by co-financing from the ERDF, their total available funding is approximately EUR 281.7 million with financing from the ERDF of EUR 247.9 million, including EUR 150 million for the energy performance of multi-apartment buildings for renovating about 1,030 buildings (ERDF co-financing — 50 % of the eligible costs of the project, average renovation costs — EUR 150–170 thousand) and EUR 97.9 million for the energy performance of buildings owned by the state for renovating about 100–120 buildings.

Considering both the inefficient area owned by the state and the number of multi-apartment buildings that have not been renovated in Latvia, it is planned to continue the programmes also in the 2021–2027 programming period for EU funds by indicatively attracting ERDF funding. Indicative implementation of these programmes in the current intensity is also planned according to the baseline scenario for the period after 2021.

In addition, it should be noted that the proposals for EC regulations regarding the 2021–2027 programming period for EU funds provide for major investments in energy efficiency, therefore major risks for not continuing the programmes have not been identified.

[134] All the information related to the project, including the initial assessment, Cabinet Regulations governing the programme, and criteria for assessing project submissions, is available on the Web page of the MoE: https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitates_paaugstinasanu_valsts_ekas; https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitates_paaugstinasanu_valsts_ekas__ii_karta_/

[135] All the information related to the project, including the ex-ante assessment that is harmonised with the EC, Cabinet Regulations governing the programme, and criteria for assessing project submissions, is available on the Web page of the MoE: https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitates_paaugstinasanu_dzivojamas_ekas/

3.2.3.2. Energy efficiency improvement programmes for individuals

Due to the peculiarities of the housing stock and the large number of private houses in Latvia, it is being considered to develop an energy efficiency improvement programme in the 2021–2027 programming period for EU funds with individuals as potential beneficiaries, including for single dwellings. The programme could provide contribution to reaching the common energy efficiency and RE targets.

3.2.4. Policy and measures for promoting energy services in the public sector

To be updated in the final version of the Plan

3.2.5. Realising the potential of gas and electricity infrastructures

AS Conexus Baltic Grid ensures the operation of Inčukalns Underground Gas Storage Facility and gas transmission pipelines in the length of 1,188 km, while AS GASO ensures the operation of gas distribution pipelines in the length of 4,950 km that include the network of natural gas pipelines, gas regulation equipment, and electrical protection equipment.

The construction of gas supply infrastructure, which started in 1962, took place in the areas with higher economic activity and higher territorial development.

The natural gas transmission infrastructure of Latvia is part of the natural gas transmission system of the Baltic States. The existing cross-border transmission system provides an opportunity to receive natural gas from Russia via cross-border gas pipelines Valday – Pskov – Rīga and Izborsk – Inčukalns UGSF. Natural gas supply in the direction Pskov – Rīga is ensured by two parallel gas pipelines that are interconnected.

The natural gas transmission and distribution network is quite dispersed and its maintenance involves corresponding expenses as well as modernisation according to safety requirements. Although maintaining infrastructure comes with costs, it is important to preserve it and ensure its complete functionality by envisaging the possibility in the future to expand the usage of the system, e.g. by using it for the transmission of refined biogas, promoting the use of renewable energy, and strengthening energy independence.

3.2.6. Regional cooperation

It is important to not only ensure cooperation with the Baltic States but also promote the implementation of cross-border projects with other cooperation partners in Europe to increase energy efficiency.

An example of a measure for increasing energy efficiency is tax policy that promotes regional cooperation/regional consultations regarding the policy of transport taxes.

3.3. Energy security

3.3.1. Electricity and gas infrastructures

Diversification of natural gas supply in Latvia and the entire Baltic region requires introduction of alternative natural gas suppliers in the market. In order to provide security of gas supply in the Baltic region and establish an efficient market, the following projects have to be implemented:

- construction of the Gas Interconnector Poland-Lithuania (GIPL) for supplying natural gas;
- construction of the regional LNG terminal;
- construction of the Balticconnector interconnection between Finland and Estonia;
- modernisation of Inčukalns UGSF;

- ensuring natural gas supplies to the region by third parties with the use of the existing natural gas supply infrastructure (i.e. by diversifying natural gas supply sources instead of routes).

It is important to use the existing infrastructure efficiently, therefore Inčukalns Underground Gas Storage Facility plays a key role in Latvia and requires further modernisation with the aim of making the storage facility more flexible to provide the market with the necessary products and ensure secure operation of the facility. It is important not only to perform a theoretical research but also to ensure attraction of investments to introduce and implement theoretical studies in practice.

It is essential to maintain the security of the existing natural gas transmission and supply system, reduce emergency risks to a minimum, and ensure secure operation of the systems. It is also necessary to implement preventive measures to reduce risks related to supply security and to ensure that Inčukalns Underground Gas Storage Facility is filled to ensure adequate pressure of natural gas and provide the final users with natural gas according to the demand.

It is important to continue the infrastructure projects and modernisation of Inčukalns Underground Gas Storage Facility, which will provide a significant direct and indirect contribution to the energy security of Latvia, Baltic States, and Finland, especially after 2020 when it is planned to complete the development of the Regional Natural Gas Market. The Regional Natural Gas Market will consist of the Baltic States and Finland.

It is planned to invest EUR 80 million in the modernisation of Inčukalns Underground Gas Storage Facility within seven years starting from 2018 in addition to approximately EUR 190 million invested in the modernisation of the facility in the last decade, including EU funding.

It is important to continue to work on the project of improving Latvia–Lithuania Interconnection, which is included in the PCI list of the EC. Although several theoretical studies have already been performed, it is important to stimulate practical implementation of the project, which would be a significant benefit for Latvia at the time of finalising the Gas Interconnector Poland-Lithuania (GIPL) project. Increasing the capacity of Latvia–Lithuania Interconnection would enable receiving natural gas from other potential sources in Europe and after the implementation of the GIPL project, considering the availability of resources, would ensure possibilities to optimise the existing natural gas transmission and supply system and efficient use of Inčukalns Underground Gas Storage Facility.

A significant project in terms of infrastructure is the Balticconnector interconnection between Finland and Estonia, which will further increase new market opportunities and allow Finland to join the regional natural gas market after the implementation of the Balticconnector project. The willingness of Finland to join the regional market is reflected by its involvement and work in the Regional Gas Market Coordination Group. Balticconnector will ensure the interconnectivity of natural gas markets of Finland and the Baltic States, increase energy security, and promote market liquidity.

The project is evolving successfully: Finland has almost finalised the development of a detailed project plan, the coastal pipeline route has been updated according to the proposals received from land owners, and the process of expropriation has been implemented successfully where necessary.

Latvia's energy dependency from imported energy sources is reducing — from 55.9 % in 2013 to 47.2 % in 2016. It can therefore be considered that Latvia is meeting its 2020 and 2030 targets through the implementation of current policies and measures. Therefore additional targets for reducing energy imports in Latvia are not set.

In the context of energy security it is necessary to implement the measure and also consider the cybersecurity aspects of the energy system, as infrastructure objects like power plants, gas and oil pipelines, and power grids are controlled digitally and are exposed to the risk of cyber-attacks.

3.3.2. Regional cooperation

The regional natural gas market in its nature provides for a single entry-exit system of natural gas transmission and a balancing zone without internal commercial interconnection points between the Baltic States and Finland. Establishment of the regional gas market together with the infrastructure development projects will promote energy security of the Baltic States and Finland due to new natural gas supply routes and access to new trading platforms.

3.4. Internal energy market

3.4.1. Electricity infrastructure

According to the current situation, the ratio of interconnections in Latvia in 2017 was 80 % (the ratio of interconnection capacity to the total electricity capacity of Latvia), therefore it can be considered that Latvia has already reached the interconnection target and additional targets as well as additional policies and measures for reaching these targets are not being set.

3.4.2. Energy transmission infrastructure

On 26 June 2018, the EC, Lithuania, Latvia, Estonia, and Poland signed a political roadmap on the synchronisation of the electricity network of the Baltic States with the continental European network, which describes the process of implementation and provides detailed explanation of how the electricity systems of the Baltic States will be synchronised with the continental European network by 2025. According to the roadmap, as soon as the approval from the BEMIP High Level Group is received in September 2018, the transmission system operators of Poland and the Baltic States will start an official procedure that will be monitored by the European Network of Transmission System Operators for Electricity (ENTSO-E). In 2018, the Baltic States region — formerly an "energy island" — is connected with Poland (LitPol Link), Sweden (NordBalt) and Finland (EstLink 1 and EstLink 2) through recently established electricity lines. For historical reasons, however, the Baltic States' electricity grid is still operated in a synchronous mode with the Russian and Belarusian systems. The desynchronisation of the Baltic States' electricity grid from these systems and the synchronisation with the continental European network is an essential political priority of the Energy Union. Projects for strengthening the respective elements of the grid are included in the third PCI list that was approved by the EC on 23 November 2017. Projects on the PCI list are also eligible to receive Connecting Europe Facility-Energy funding.

On 14 September 2018, the BEMIP High Level Group, represented by the Baltic States, Poland, and the EC, approved the technical scenario for synchronising the Baltic States' electricity grid with the continental European network. According to this scenario, synchronisation will be ensured by using the existing Lithuania–Poland interconnection LitPol Link and an additional submarine cable between Lithuania and Poland, as well as synchronous condensers in the hydroelectric power plants of all Baltic countries.

Polish scientists have approved this scenario as technically the safest and the most feasible one. The decision made allowed the transmission system operators of Latvia, Lithuania, and Estonia to submit a joint application to the European Network of Transmission System Operators for Electricity (ENTSO-E) about expanding the synchronous area of the continental European network and to submit a joint application to the Connecting Europe Facility (CEF) for receiving

funding for implementing the first stage of the synchronisation project in the amount of EUR 432 million with 75 % of the funding expected to come from the EU.

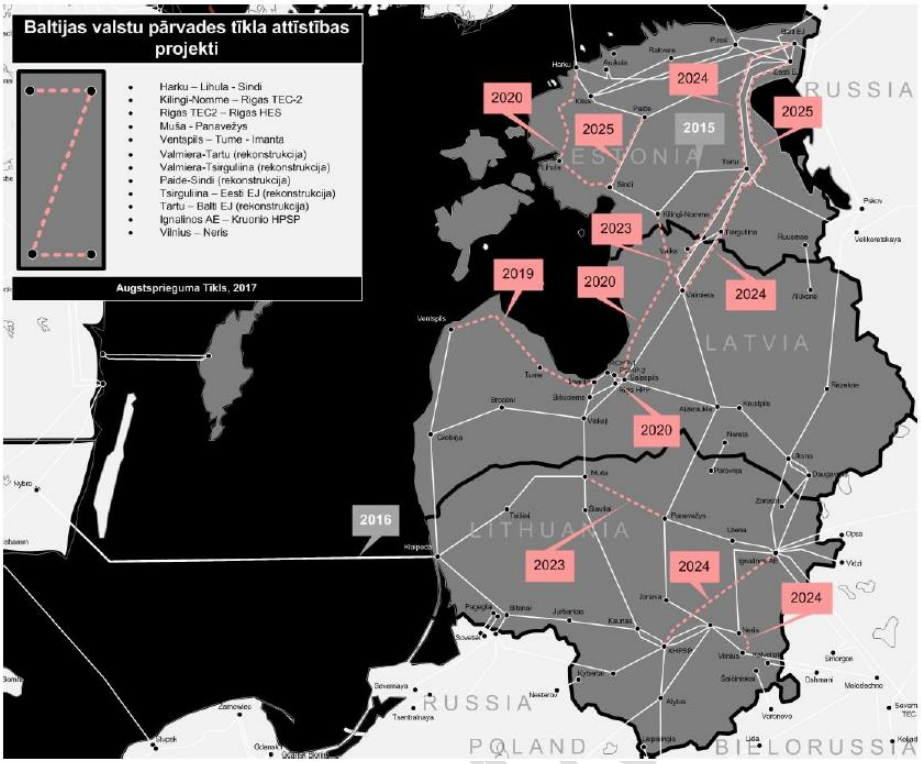


Figure 8. Projects of the Baltic States according to the plans of the transmission system operators of the Baltic States[136]

One of the priorities of the EnU strategy is security of energy supply, which is ensured in Latvia and partially the entire Baltic region by IUGSF. Modernisation projects are implemented from the funds of the only natural gas storage operator in Latvia with co-financing from the EU. Modernisation of the storage facility is implemented in several stages by performing both theoretical studies and practical construction. The modernisation project includes reconstruction of boreholes and compressors and construction of a new collection point to replace the old collection point, which will result in higher security of the storage facility and natural gas output values increasing from 30 million m3 to 32 million m3 a day or from approximately 314,000 MWh to 335 000 MWh a day. Due to the regional importance of IUGSF the developers of the study recommended to keep the status of the project as a PCI, since IUGSF is important for the security of natural gas supplies, diversifying the supply sources, and increasing market competition.

[136] http://www.ast.lv/sites/default/files/editor/20181001_PSO_Zinojums_2017.pdf

Figure 9. Natural gas infrastructure projects planned in the Baltics[137]

3.4.3. Market integration

3.4.3.1. Policies and measures

The most important measure for market integration is currently the synchronisation of the electricity networks of the Baltic States with European networks. On 19 September 2018, Baltic Transmission System Operators submitted an official letter to the Polish transmission system operator with a request to refer to ENTSO-E Regional Group Continental Europe with an application on expanding the synchronous area of the Continental Europe to the Baltic States. On 21 September 2018, the Polish TSO submitted the application to ENTSO-E Regional Group Central Europe. The meeting of the Regional Group discussing the application took place on 9 October 2018. A Working Group on the Project of the Baltic States was established during the meeting that will work on the technical issues regarding further progress of the synchronisation project. The next meeting of the Regional Group Central Europe will take place at the beginning of December 2018 to seek for a mandate so that the Working Group on the Project of the Baltic States can start working on the Connection Agreement about the synchronisation of the electricity network of the Baltic States with the continental European network including both legal and technical aspects. It will require about six months to prepare the Agreement, therefore it might be signed in the summer of 2019. It is planned to implement the synchronisation project by 2025.At the same time it is important that the gas and electricity interconnections specified in the previous section are also established.

3.4.3.2. Measures to increase flexibility of the energy system

The Ministry of Economics will develop legislation on the operation of aggregators in the electricity market in 2019. An aggregator is a market operator that combines the power not

[137] http://www.conexus.lv/uploads/filedir/parvades_operatora_zinojums_2018.pdf

consumed by several clients or the electricity produced for selling, procurements, auctions, or any regulated electricity market. An aggregator can merge the reduction/increase of electricity consumption and the reduction/increase of electricity production or combine the electricity acquired during both processes. There is a distinction between an independent aggregator, which is not attached to any electricity trader or market operator, and an aggregator attached to a trader. In case of an independent aggregator, the final consumer has to conclude two contracts — a supply contract with the electricity trader and a "flexibility contract" with the aggregator. The flexibility contract ensures that the aggregator has direct access to the power and equipment of the consumer and, in case it is necessary for the market, the aggregator reduces the consumption of the user in a controlled manner to enter the market with the electricity that has not been consumed. A separate settlement mechanism is governing how and whether the aggregator provides compensation to the trader for electricity savings or surplus electricity of the final consumer that is managed by the aggregator. An aggregator attached to a trader performs its function by using control mechanisms to earmark a specific amount of electricity savings for the final consumer defined by the trader. Thus the trader is aware of the electricity reserve it can use in case it is necessary for balancing the market situation or in case of high electricity prices. The final consumer concludes only one contract — with the trader.

Depending on the market regulation, an aggregator can be made responsible for the balance or the service provider can be the only one ensuring fixed electricity supplies.

The Ministry will find a solution for the most appropriate model of operation for the aggregators and incorporate it in the national regulation.

Regarding the 2022 target for replacing smart meters, an average of more than 110,000 meters are replaced each year to reach it. In September 2018, about 500,000 smart meters were installed, representing 47 % of the total number of electricity meters of the clients of AS Sadales tīkls. It was calculated at the end of 2017 that the smart meters installed are registering 78 % of the total electricity consumption of all clients.

3.4.3.3. Measures to ensure non-discriminatory integration of RE, demand response and storage

There are currently no restrictions for introducing and using any RE technologies in the territory of Latvia. Cabinet Regulation No. 240 of 30 April 2013 "General Regulations for the Planning, Use and Building of the Territory" includes conditions to be taken into consideration for developing transport infrastructure when creating a wind park.

3.4.3.4. Policies and measures for the protection of consumers

According to Section 33^1 of the Electricity Market Law, a trade service of a protected user can only be provided by one electricity trader or service provider selected in a tender and in possession of a compliance assessment of the protected user to apply compensation to electricity bills.

Considering the current framework of the Electricity Market Law, receiving the compensation of a protected user is complicated for the users and sub-users that have not entered into agreement with a trade service provider of a protected user (until now — AS Latvenergo). Therefore the mechanism of the protected user as a social tool does not reach all persons corresponding to the definition of a protected user, which also restricts competition between electricity traders in a certain way. The Ministry of Economics wants to create a new, simplified system for ensuring support to protected users operated and maintained by the State Construction Control Bureau of Latvia. Namely, the data system operated by the Bureau will summarise data about the persons qualifying for the status of a protected user and the amount of support they are entitled to, which they will be able to receive from any electricity trader that wants to provide a trade service of a protected user.

3.4.3.5. Measures for enabling and developing demand response

In response to the development trends of the electricity market and changes planned in the EU legislation, transmission system operators of the Baltic States and Finland, Litgrid AB, Elering AS, and AS Augstsprieguma tīkls, organised a working group in 2017 with the aim of developing a conceptual offer for establishing a common framework for the market of the Baltic States to introduce demand response services in the balancing market through aggregation (Demand Response through Aggregation – a Harmonized Approach in the Baltic Region).

The working group came to the following conclusions:

- due to the expected structural changes in generation, it is necessary to promote the development of demand response by establishing an adequate market framework to involve both integrated and independent aggregators;
- in order to ensure effective market integration of demand response in a European-wide market, it is necessary to develop a common market framework for including demand response services in the balancing market;
- the market framework should ensure that:
  - all market operators that are technically capable of taking part in the demand response product market can do it;
  - the framework does not contribute to market-distorting regulations and does not exert a strong negative pressure on retail electricity prices;
  - all market operators are responsible for the imbalances they create;
  - a transparent and regulated mechanism is used for determining the amount of the activated demand response.

The most important task at the moment is to develop a well-functioning legal framework for realising the demand response service.

3.4.4. Energy poverty

To ensure the reduction of energy poverty rates and the number of households and persons subject to energy poverty, it is necessary to:

- develop and establish the definition and criteria for energy poverty;
- establish horizontal application of the principle of fighting energy poverty in the development of sectoral development planning documents of Latvia;
- develop support measures to avoid placing a significant financial burden on certain energy consumers related to the electricity or gas connection, e.g. for installation of the connection.

3.4.5. Regional cooperation

It is important to promote regional cooperation in order to achieve a well-functioning internal energy market, diversify the supply of natural gas, and improve market liquidity. Promotion of regional cooperation would ensure, for example, attraction of new natural gas traders in Latvia with offers that would ensure more preferential prices of natural gas and economically sound energy bills for consumers. It is necessary to continue the work in the Regional Gas Market Coordination Group and the Baltic Council of Ministers' Committee of Senior Energy Officials. Both of these platforms promote important political issues such as regional gas market, electricity trade with third countries, and synchronisation of the Baltic power grid with the European network.

3.5. Research, innovation and competitiveness

3.5.1. Policies and measures

SDSL2030[138] lays down the following possible solutions for reaching the objectives in this dimension:

- user-driven innovations;
- practice of open innovations;
- innovative entrepreneurship;
- culture of mass creative activity.

Measures laid down in GDSTI2020 for reaching R&D, innovation, and competitiveness objectives influencing the period covered by the Plan to be implemented indicatively in the period after 2020:

1) Increasing competitiveness of the STI field (competent authority: MoES)

The main objectives of this line of action:

- create the national post-doctoral research support system;
- support applied research for solving sectoral or societal issues;
- support implementation of individual post-doctoral R&D projects, including creation of post-doctoral jobs at enterprises;
- provide a 100 % allocation of the estimated basic funding for science and its progressive increase;
- introduce the unity principle of academic and research work;
- introduce research excellence focused criteria in the allocation of basic funding and project funding;
- support participation of Latvian scientific institutions in EU and other international organisations of scientific cooperation, etc.

In order to reach the objectives 1, 2, 3, and 7 of this line of action, it is planned to use the 2014–2020 EU funding for the specific support objective "To increase the research and innovation capacity of scientific institutions of Latvia and the ability to attract external financing by investing in human resources and infrastructure". A new approach to assessing scientific projects has been introduced, including by adopting the approach to assessment and criteria for assessing the scientific quality of projects of Horizon 2020 and attracting external experts registered in an internationally recognised database of experts to assess the scientific excellence of scientific projects.

2) Linking the STI industry with the needs of social and economic development (competent authorities: MoES, MoE)

The main objectives of this line of action:

1) assign priority to doctoral and post-doctoral research associated with tackling scientific or technological problems identified by the industry;
2) continue to implement national research programmes;

[138] http://polsis.mk.gov.lv/documents/3323

3) continue to develop competence centres as a long-term platform for cooperation between scientific institutions and economic operators;

4) continue the development of technology transfer contact points established at the universities for the support of technology transfer and innovations; create a single technology transfer platform;

5) promote cooperation of universities with companies and cooperation of companies with the companies of other countries in the creation of various innovative products and commercialisation.

In order to reach the objectives 1, 3, 4, and 5 of this line of action, it is planned to use the 2014–2020 EU funding for the specific support objectives "To increase the research and innovation capacity of scientific institutions of Latvia and the ability to attract external financing by investing in human resources and infrastructure" and "To increase private sector investments in R&D".

Table 8. Measures for linking the STI industry with the needs of social and economic development

Measure	Outcome	Funding
Measures of the 2014–2020 EU funding for the specific support objective "To increase the research and innovation capacity of scientific institutions of Latvia and the ability to attract external financing by investing in human resources and infrastructure": Measure 1.1.1.1.Applied research[139] — for the implementation of projects focused on commercialisation Measure 1.1.1.2. Support for post-doctoral research[140] — for increasing the research capacity and career development of young (post-doctoral) scientists Measure 1.1.1.3. Innovation grants for students[141] — development of leadership, innovation, and entrepreneurial skills of students, and creation of innovative ideas through cooperation between universities and companies Measure 1.1.1.4. Development of R&D infrastructure in the fields of smart specialisation and strengthening the institutional capacity of scientific institutions — modernisation of R&D infrastructure in universities and	– attract private investments in the amount of EUR 16 million by 2023 – 450 economic operators cooperating with research institutions – the number of new products and technologies suitable for commercialisation with support received for their development — 530	Planned total funding for the measures — EUR 333.8 million. Planned ERDF funding for the measures — EUR 278.99 million.

[139] https://www.cfla.gov.lv/userfiles/files/IZM_1111_140618.pdf
[140] http://www.viaa.gov.lv/lat/pecdoktoranturas_atbalsts/pecdoktorantura_apraksts/
[141] http://www.izm.gov.lv/images/ES_fondi/prezentacijas/1113.pdf

Measure	Outcome	Funding
scientific institutions and strengthening the research and innovation capacity of scientific institutions of Latvia and the ability to attract external financing by promoting the development of research environment and human capital employed in research. Measure 1.1.1.5. Support for the development of interinstitutional and international cooperation[142]: – in-depth analysis of the needs of specialisation areas corresponding to the Smart Specialisation Strategy of Latvia (RIS3), coordination of ecosystems, and monitoring; – by providing informative and financial support, MoES promotes participation of scientific institutions, companies, national regulatory authorities, and public organisations of Latvia in 1) Horizon 2020, including for implementing projects in thematical programmes *Secure, Clean and Efficient Energy*, *Smart, Green and Integrated Transport*, and *Climate Action, Environment, Resource Efficiency and Raw Materials*; 2) EURATOM research and training programme on nuclear energy (nuclear fusion / nuclear fission); 3) common programming initiatives[143] — Clean Sky Joint Technology Initiative of the aeronautics and air transport industry[144]; Fuel Cells and Hydrogen Initiative[145]; Electronic Components and Systems[146]; Shift2Rail[147]; Single European Sky Initiative[148]; – ensuring Latvia's participation in ERA-NET COFUND project		

[142] http://www.viaa.gov.lv/lat/zinatnes_inovacijas_progr/eraf_projekts/par_eraf_projektu/
[143] http://ec.europa.eu/programmes/horizon2020/en/area/partnerships-industry-and-member-states
[144] https://europa.eu/european-union/about-eu/agencies/clean-sky2_lv
[145] https://www.fch.europa.eu/
[146] https://www.ecsel.eu/
[147] https://shift2rail.org/
[148] https://www.sesarju.eu/

Measure	Outcome	Funding
consortiums, including ERA-NET Smart Energy Systems[149]; – ensuring Latvia's participation in the Baltic BONUS[150] (2010–2017) programme that promotes international cooperation in science and innovation by supporting partnerships between scientists and entrepreneurs in Latvia with the scientists and entrepreneurs of the Baltic States or EU Member States of the Baltic Sea Region in research and innovation projects.		
Measures of the 2014–2020 support objective "To increase private sector investments in R&D": – "Support for the development of new products and technologies within competence centres"; – "Support for the introduction of new products into production"; – "Support for the improvement of technology transfer system"	Within the measure "Support for the development of new products and technologies within competence centres" until 31 December 2023: – 123 projects for long-term cooperation between economic operators and researchers for placing new products on the market supported; – expenses in the amount of EUR 17,296,746 certified within the first and second stage; – expenses in the amount of EUR 16,781,880 certified within the fourth stage; Within the measure "Support for the introduction of new products into production" until 31 December 2023: – support provided for 30 economic operators for the development of new technologies for placing new products on the market; – private investments in the amount of at least EUR 10,588,235 made; Within the measure "Support for the improvement of technology	Planned total funding for the measures — EUR 193.08 million. Planned ERDF funding for the measures — EUR 158.81 million.

[149] https://www.eranet-smartenergysystems.eu/About/Funding_Partners
[150] http://viaa.gov.lv/lat/zinatnes_inovacijas_progr/baltic_bonus/par_baltic_bonus/

Measure	Outcome	Funding
	transfer system" until 31 December 2023: – 100 projects for commercialising research results supported; – support provided to 320 economic operators receiving grants.	

3) Efficient management of the STI field (competent authority: MoES)

The main objectives of this line of action:

- increase the efficiency of R&D investments;
- ensure increase of the funding from the state budget for science, technology and innovation and provide basic funding for science according to these arrangements;
- introduce a system for monitoring and impact assessment of the implementation of the STI policy.

4) Support for innovative economic operators (competent authorities: MoE, MoES)

In order to reach the objective of this line of action, it is planned to use the funding for the specific support objectives "To increase private sector investments in R&D" and "To promote implementation of innovation by economic operators" of EU funds for 2014–2020. These measures could indicatively be implemented in the same intensity also in the period after 2021.

5) Rising of public awareness, promotion of science and innovation (competent authority: MoES)

The objective is to promote achievements in science and innovation and the industry, which can have a positive impact on attracting talented young people to science and technology development.

At the World Congress of Latvian Scientists taking place on 18–21 June 2018 it is planned to bring together scientists from Latvia and of Latvian origin and their friends to discuss the development of Latvia in the next hundred and two hundred years.

From 2018 to 2023 it is planned to implement the integrated campaign for science promotion that will raise public awareness about the importance of science in increasing welfare and competitiveness of the economy.

6) Increasing human capital employed in research, development of knowledge base, promoting research collaboration (competent authority: MoES)

The measures implemented by MoES are horizontal, and policy instruments are designed with the aim of increasing human capital employed in research and strengthening innovation capacity in Latvia in general, develop research and innovation infrastructure and ensure its availability, as well as facilitate cooperation between scientific institutions and technology transfer between research and businesses.

Table 9. Measures for increasing human capital employed in research, developing knowledge base, and promoting research collaboration

Measures implemented	Measures planned
In order to focus scientific research on issues important for the	Continue the

sustainability and development of Latvia, Latvia's priority directions in science, including energy and climate issues, are established every four years • Priority Directions in Science for 2014–2017[151]. • Priority Directions for 2018–2021[152]. <u>Research programmes funded from the state budget</u> *Programme for Fundamental and Applied Research Projects (FARP)* is implemented with the aim of creating new knowledge and technological developments in all scientific fields according to priority directions of science in Latvia. FARP is organised in the form of an open tender with research topics defined by researchers themselves according to the research capacity and direction. The tender for the first stage of FARP was already organised in 2018 according to the new FARP requirements[153] approved on 15 December 2017 with scientific quality of the project as the main condition for granting the funding, which is evaluated by foreign experts. National research programme (NRP) — public procurement for implementing scientific research in a specific priority sector for the country with the aim of creating new knowledge, skills, and innovation and developing new products, processes, and services, thus contributing to the strategic development goals of the sector and the country. National research programmes are developed and funded by sectoral ministries. In the period from 2018 to 2021, the Ministry of Economics is implementing a NRP "Energy" with four thematic areas — Renewable and Local Energy Sources, Energy Efficiency, Sustainable Energy Infrastructure and Market, and Analytical Framework for Long-Term Planning of the National Energy Policy.	implementation of FARP and NRP. Promote participation and cooperation of scientific institutions, companies, national regulatory authorities, and public organisations of Latvia in the new EU Framework Programme for Research and Innovation Horizon Europe (2021–2027)[154] where one of the three pillars is Global Challenges and Industrial Competitiveness and one of the five thematic clusters is Climate, Energy and Mobility.

According to the proposals for EC Regulations, the 2021–2027 programming period for EU funds supports investments in promoting energy efficiency, transition to renewable energy, measures related to adaptation to climate change and prevention of risks related to climate change, as well as measures in the area of water and waste management (which can include, inter alia, addressing challenges in the energy sector and climate issues). Objectives for integrating climate measures in all EU programmes with the aim of allocating a total of 25 % of EU spending for reaching climate objectives have been set for the 2021–2027 programming period. To make sure that full potential of a programme is realised with regard to contribution to reaching climate objectives, the EC has endeavoured to define the required actions throughout the entire programme from development and implementation to review and assessment. The content of the draft National Energy and Climate Plan will have to be taken into consideration when planning investments.

[151] https://likumi.lv/doc.php?id=262091
[152] http://www.izm.gov.lv/lv/zinatne/latvijas-zinatnes-prioritarie-virzieni
[153] https://likumi.lv/ta/id/295784-fundamentalo-un-lietisko-petijumu-projektu-izvertesanas-un-finansejuma-administresanas-kartiba
[154] https://ec.europa.eu/commission/publications/research-and-innovation-including-horizon-europe-iter-and-euratom-legal-texts-and-factsheets_en

3.5.2. Cooperation with other EU Member States

Latvia has been part of the RIS3 platform[155] established by the Joint Research Centre since 2014 to develop the capacity of implementing RIS3 and establish research and innovation cooperation with other EU regions in this platform.

In 2018, a Memorandum of Understanding was signed between Nordic Energy Research and the governments of Estonia, Latvia, and Lithuania for starting Nordic energy research and implementing a programme for cooperation between the Baltic States for establishing energy research programme for EUR 2.4 million. Three main objectives of the programme are:

- promotion of intra-Baltic and Baltic-Nordic research projects with participation of Baltic researchers;
- Baltic-Nordic PhD collaboration programme;
- exchange of energy researchers between the Baltic and Nordic countries.

Within a period of three years it is planned to implement six projects for sharing experience between researchers and establishing a new PhD programme.

3.6. Financing arrangements

MFF2027

By the end of 2018, availability of EU funds in the period covered by the Plan can only be assumed based on the draft MFF2027. However, the amount of funding in each fund may change as a result of negotiations.

Figure 10. The new MFF for the period from 2021 to 2027 (billion EUR at current prices)[156]

InvestEU

The InvestEU Programme with EUR 14.7 million received from the EU budget will be able to attract additional investments in the entire Europe in the amount of over EUR 650 million (sustainable infrastructure — EUR 185 billion, research and innovation — EUR 200 billion, social investments and skills — EUR 50 billion, small and medium-sized companies — EUR 215 billion).

[155] http://s3platform.jrc.ec.europa.eu/home
[156] https://ec.europa.eu/commission/sites/beta-political/files/budget-proposals-modern-eu-budget-may2018_lv_0.pdf

The EU's long term goals regarding sustainability, competitiveness, and inclusive growth require significant investments in new mobility models, RE, energy efficiency, research and innovation, digitisation, education and skills, social infrastructure, circular economy, climate action and, most importantly, creation and growth of small businesses. The EC proposes to establish a new, fully integrated investment fund InvestEU. InvestEU will anchor all centrally managed financial instruments inside the EU in a single, streamlined structure. This new approach will avoid overlaps, simplify access to funding, and reduce administrative burden. In addition, the InvestEU Fund will provide advisory services and accompanying measures to support the creation and development of projects.

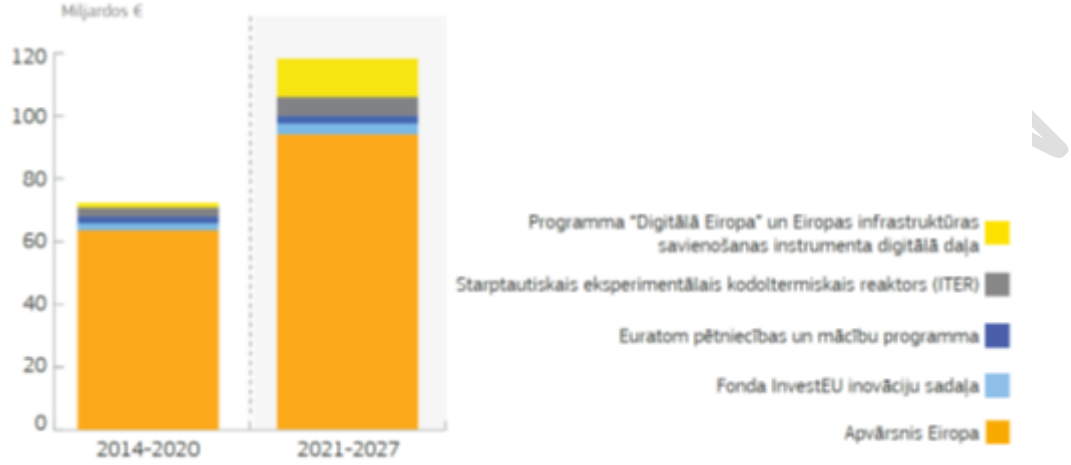


Figure 11. Breakdown of the InvestEU funding[157]

Horizon Europe

Horizon Europe is the EU's flagship programme to promote research and innovation in the period from 2021 to 2027 with the aim to provide financial support to promising projects aimed at excellency submitted by international consortiums in the thematic priority areas of the EU. They tend to have a scale, scope and level of sophistication that would prevent them from going ahead with national funding alone: 83 % of EU Research & Innovation projects rated as "excellent" would not have gone ahead without EU support.

Horizon Europe focuses on science and innovation, aiming to:

- strengthen the EU's scientific and technological base;
- foster the EU's competitiveness and its innovation performance;
- deliver on the EU's strategic priorities and tackle global challenges.

It is proposed that the total budget would be EUR 97.2 billion with EUR 15 billion for research and innovation in the area of Climate, Energy and Mobility, EUR 15 billion for Digital and Industry, and EUR 10 billion for Food and Natural Resources.

Connecting Europe Facility

The Connecting Europe Facility supports investments in cross-border infrastructures in the transport, energy and digital sectors. The Facility is designed to foster investment in the trans-European networks. Trans-European networks and cross-border cooperation are crucial not only to the functioning of the single market, but they are also strategic to implement the EnU, the digital single market and the development of sustainable transport modes. Interoperable cross-border networks are key to reducing the current fragmentation. Without EU intervention, private operators and national authorities have insufficient incentive to invest in cross-border

[157] https://ec.europa.eu/commission/sites/beta-political/files/budget-proposals-investments-may2018_lv.pdf

infrastructure projects. The Facility also provides the opportunity to deploy technologies developed at EU level and in particular through the EU Research and Innovation Framework Programmes, boosting their market uptake and ensuring that the trans-European networks use the most advanced available equipment.

The total proposed budget is EUR 42.2 billion. The Connecting Europe Facility supports investment and cooperation to develop infrastructure in the transport, energy and digital sectors and connects the EU and its regions. It further aligns with the policy objectives of decarbonisation and digitisation of the European economy, covering three strands:

- For transport, it aims at completing both layers of the European network for all transport modes: the strategic backbone (i.e. the core network) by 2030 and its more extensive layer (i.e. the comprehensive network) by 2050. It also supports the deployment of European traffic management systems for air transport and railways, and helps the EU transition towards connected, sustainable, inclusive, safe and secure mobility. It contributes to the decarbonisation of transport, for example by constituting a European network of charging infrastructure and for alternative fuels or prioritisation of environmentally friendly transport modes.
- For energy, the focus is on completing priority sections of the energy networks essential for the internal market. It also seeks to deliver smart and digitised energy grids, so as to achieve interconnection targets and improve security of supply. It will also be important to foster cooperation between Member States by integrating cross-border renewable energy projects.
- For digital, the Facility maximises the benefits that all citizens and businesses can get from the Digital Single Market. The deployment of very high capacity digital networks supports all innovative digital services, including connected mobility. In addition, it contributes to ensuring that all main socio-economic drivers such as schools, hospitals, transport hubs, main providers of public services and digitally-intensive enterprises have access to future-oriented broadband connections by 2025.

ERDF and CF

Cohesion Policy is the main investment policy of the EU as it is a major driver of job creation, sustainable growth and innovation in Europe's diverse regions. It reinforces economic, social, and territorial cohesion of the EU. Today, Member States and regions need further support to tackle new and persistent challenges, such as harnessing globalisation, addressing industrial change, embracing innovation and digitalisation, managing migration in the long run and fighting climate change.

It is proposed to modernise the ERDF and the CF and simplify their objectives. The total proposed budget for the ERDF and the CF is EUR 241.9 billion[158] with funding available in the following dimensions[159]:

- "a smarter Europe by promoting innovative and smart economic transformation":
  - improving research and innovation capacity and introduction of advanced technologies,
  - taking advantage of digitalisation opportunities for people, businesses, and governments,
  - increasing growth and competitiveness of SMEs,
  - developing skills for smart specialisation, industrial transition, and entrepreneurship;
- "a greener, low carbon Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk prevention and management":

[158] EUR 273 billion at current prices
[159] https://eur-lex.europa.eu/legal-content/LV/TXT/HTML/?uri=CELEX:52018PC0372&from=EN

- promoting energy efficiency measures,
- promoting renewable energy,
- developing smart energy systems, grids, and energy accumulation,
- supporting adaptation to climate change, risk assessment, and resilience to disasters,
- promoting sustainable management of water,
- supporting transition to circular economy,
- enhancing biodiversity, improving green infrastructure in urban areas, and reducing pollution;

- "a more connected Europe by enhancing mobility and regional ICT connectivity" (policy objective 3):
  - enhancing digital connectivity,
  - developing a sustainable, climate resilient, intelligent, secure and intermodal TEN-T,
  - developing a sustainable, climate resilient, intelligent and intermodal national, regional and local mobility, including improved access to TEN-T and cross-border mobility,
  - promoting sustainable multimodal mobility in cities;
- "a more social Europe by implementing the European pillar of social rights" (policy objective 4):
  - improving the effectiveness of labour markets and access to quality employment trough developing social innovation and infrastructure,
  - improving access to inclusive and quality services in education, training and lifelong learning through developing infrastructure,
  - increasing the socioeconomic integration of marginalised communities, migrants and disadvantaged groups through integrated measures, including housing and social services,
  - ensuring equal access to health care through developing infrastructure, including primary care;
- "a Europe closer to citizens by fostering the sustainable and integrated development of urban, rural and coastal areas and local initiatives" (policy objective 5):
  - promoting integrated social, economic and environmental development, cultural heritage and security in urban areas,
  - promoting integrated local social, economic and environmental development, cultural heritage and security through local development led by the society, including in rural and coastal areas.

The ERDF supports:

- investments in infrastructure,
- investments in access to services,
- productive investments in SMEs,
- hardware, software and intangible assets,
- information, communication, research, networking, cooperation, exchange of experience and activities related to clusters,

- technical assistance.

The CF supports:

- environmental investments, including investments related to sustainable development and energy and benefits to the environment,
- investments in TEN-T (Trans-European Transport Network),
- technical assistance.

LIFE — Programme for the Environment and Climate Action

LIFE is the EU Programme for the Environment and Climate Action. Its main focus is the development and implementation of innovative ways to react to problems in the area of climate, thus favouring changes in policy development, implementation and enforcement.

The total proposed budget is EUR 5.4 billion with funding available in the following dimensions:

- transition to circular economy, which is characterised by efficient use of resources and energy, low carbon emissions, and climate resilience;
- protection and improvement of environmental quality;
- nature conservation, halting biodiversity loss, and restoring biodiversity.

European Agricultural Guarantee Fund and European Agricultural Fund for Rural Development

The common agricultural policy is an important policy of the Union aiming to increase agricultural productivity, ensure a fair standard of living for the agricultural community, stabilise markets, and improve competitiveness. A modernised common agricultural policy will have to support transition to a completely sustainable agricultural industry and development of thriving rural livelihoods by providing safe, secure and high quality food for more than 500 million consumers.

The total proposed budget is EUR 365 billion, and the common agricultural policy after 2020 mainly focuses on the objectives that cover all three dimensions of sustainable agriculture:

- to foster a smart and resilient agricultural sector;
- to bolster environmental care and climate action and to contribute to the environmental and climate objectives of the EU;
- to strengthen the socio-economic fabric of rural areas.

European Maritime and Fisheries Fund

The European Maritime and Fisheries Fund is a special EU programme for supporting the EU fisheries industry and coastal communities that depend on it.

The total proposed budget is EUR 6 billion with funding available in the following dimensions:

- safeguarding healthy seas and oceans and delivering sustainable fisheries and aquaculture by reducing the impact of fisheries on the maritime environment while enhancing the competitiveness and the attractiveness of the fisheries sector;
- promoting the blue economy, particularly by fostering sustainable and prosperous coastal communities towards investment, skills, knowledge, and market development;
- strengthening international ocean governance and the safety and security of maritime space in areas which are not already covered by the international fisheries agreements.

Climate funding

EAAI

Income from the auctioning of emission allowances in phase 3 of the ETS (2013–2020) could indicatively be about EUR 170 million over the entire period. However, this figure may significantly differ depending on the volatility of the emission allowances market.

According to the latest amendments to Directive 2003/87/EC, in the period from 2021 to 2030 Latvia would auction about 16.07 million emission allowances or approximately 1.6 million emission allowances per year, and at the potential average price of EUR 25[160] per allowance in phase 4 auctioning of the emission allowances could contribute up to EUR 401.75 million to the state budget of Latvia. It should be noted that the actual figures can differ from the projections as there are still many unknown factors, including the initial total amount for 2021, therefore it is not possible to calculate a precise amount to be auctioned each year. Moreover, the income largely depends on the price of emission allowances, which can also differ from projections due to large fluctuations[161].

The use of proceeds from auctioning emission allowances is laid down in Section 32^2, Paragraph 4^4 of the Law On Pollution: the revenue from auctioning emission allowances shall be used only for climate change mitigation and ensuring adaptation to climate change, including reduction or restriction of GHG emissions in energy, industry, transport, agriculture and waste management sectors, while Section 32^2, Paragraph 4^6 of the Law lays down that the use of auctioning revenue for the objectives referred to in Section 32^2, Paragraph 4^4, Clauses 1 and 2 shall be ensured by organising open tenders of project applications.

The funds accumulated from auctions in previous years by the end of 2017 were used for implementing two project tenders that resulted in the approval and implementation of 16 projects.

Funding for both tenders was granted for implementing energy efficiency measures in buildings, covering both direct reduction of GHG emissions and indirect reduction of GHG emissions as a result of project demonstration and the multiplying effect. Indirect GHG reductions are very important as reaching climate targets requires gradual, comprehensive and significant changes in the economy and people's lifestyles. Demonstration projects, e.g. in the tender "Reduction of Greenhouse Gas Emissions — Low Energy Consumption Buildings", attract public attention and encourage an increasing number of people to, if not transition to low energy consumption buildings, at least implement energy efficiency measures, with a significant multiplying effect of the investments on further reduction of GHG emissions in the building sector.

Table 10. Overview of the progress on the use of funding in tenders funded by EAAI in 2017

Item No.	Title of the tender	EAAI funding available (EUR)	EAAI funding granted (EUR)
EAAI-1	Reduction of greenhouse gas emissions in protected architectural monuments of natural significance	9,000,000.00	8,868,342.93

[160] This price was estimated in 2015 when working on the amendments to Directive 2003/87/EC (https://ec.europa.eu/clima/sites/clima/files/ets/revision/docs/impact_assessment_en.pdf) and is also confirmed by the forecasts of several leading experts (see Section 4.1.3).
[161] See Section 4.1.3.

EAAI-2	Reduction of greenhouse gas emissions — low energy consumption buildings	23,000,000.00	22,998,907.53
	Total:	**32,000,000.00**	**31,867,250.46**

More information on the tenders organised by EAAI is available in annual informative reports on the use of auction revenues in 2017.

Cabinet Regulation No. 333 "Statute of the Open Tender "Reduction of Greenhouse Gas Emissions with Smart Urban Technologies" Funded by the Emission Allowances Auctioning Instrument" entered into force on 28 June 2018. The aim of the tender is to introduce and demonstrate smart urban technologies that reduce greenhouse gas emissions. The funding available from the financial instrument for the tender is EUR 8,000,000, out of which EUR 2,000,000 are dedicated to installing smart urban technologies that use renewable energy and EUR 6,000,000 for introducing smart urban technologies that promote energy efficiency.

Cabinet Regulation No. 418 "Statute of the Open Tender "Reduction of Greenhouse Gas Emissions by Developing the Construction of Energy Self-Sufficient Buildings" Funded by the Emission Allowances Auctioning Instrument" entered into force on 24 July 2018. The aim of the tender is to limit the potential greenhouse gas emissions by supporting the construction of new and sustainable low energy consumption self-sufficient buildings (hereinafter — energy self-sufficient buildings) and ensuring demonstration and promotion of technologies required for low carbon development in Latvia. The funding available from the financial instrument for the tender is EUR 10,000,000.

NER300 and Innovation Fund

NER300 was established during phase 3 of the ETS for innovative low carbon energy demonstration projects. NER300 supports:

- projects with the aim of environmentally safe carbon capture and storage (CCS projects)[162];
- projects for demonstrating innovative RE technologies.

It is planned that NER300 will be replaced by the Innovation Fund in phase 4 of the ETS by 2020 to cover a wider range of projects in addition to those covered by NER300, including projects for capturing and using carbon, innovative RE and energy storage technology projects, and innovative projects in energy intensive manufacturing. According to the information provided by the EC and its commitments, after 2020 the Innovation Fund will receive 450 million emission allowances, the auctioning of which in the common emission allowances auctioning platform could secure a funding of EUR 5.4 bullion (at a price of EUR 12.05, which was the average in the first half of 2018) or EUR 11.25 billion (at the estimated average price of emission allowances of EUR 25 in the period from 2020 to 2030).

The funding from the Innovation Fund will be available to Latvia. It is not possible to predict a specific amount of funding available to Latvia, as Member States will apply for the funding of the Innovation Fund themselves after assessing and approving the projects submitted by the applicants in the respective country. The funding from the Innovation Fund will be granted according to the same principles as NER300, which was also established in the framework of the ETS. Thus it is in the interest of the Member States and the economic operators in these Member States to develop successful projects involving innovative solutions for promoting the use of RES or implementation of CCS projects, as well as to prepare and submit the documentation of

[162] According to Section 8^2 of the Law On Pollution, storage of carbon dioxide in geological formations, as well as in the water column is prohibited in the territory of Latvia, the exclusive economic zone and continental shelf thereof.

such projects for receiving funding from the Innovation Fund. It should be noted that the funding of the Innovation Fund will be available to all EU Member States and also for small-scale projects in the sectors of energy and industry.

Modernisation Fund

The Member States with GDP per capita in 2013 (at market prices) lower than 60 % of the average GDP in the EU will be able to receive funding from the Modernisation Fund in the period after 2020. The funding from the Modernisation Fund will be available to fund projects for improving energy efficiency and modernising the energy industry (including small-scale projects) in ten EU Member States, including Latvia. At least 70 % of the financial resources from the Modernisation Fund shall be used to support investments in the generation and use of electricity from renewable sources, improvement of energy efficiency, except energy efficiency relating to energy generation using solid fossil fuels, energy storage and modernisation of energy networks, including district heating pipelines, grids for electricity transmission and increase of interconnections between Member States, as well as to support a just transition in carbon-dependent regions in the beneficiary Member States, so as to support the redeployment, reskilling and upskilling of workers, education, job-seeking initiatives and start-ups, through dialogue with the social partners. Investments in energy efficiency in transport, buildings, agriculture and waste management shall also be eligible.

According to the EC estimates, the Modernisation Fund will receive 310 million emission allowances, which could amount to EUR 3.74 billion at the average price of emission allowances in the first half of 2018 of EUR 12.05 (EUR 7.75 billion at the estimated average price of emission allowances of EUR 25 in the period after 2020). According to Annex 2(b) of Directive 2003/87/EC, the maximum amount available to Latvia for implementing the projects corresponds to 1.44 % of the total funding available within the Fund or approximately 4.464 million emission allowances, which can range from EUR 53.79 million at a price of EUR 12.05 per emission allowance to EUR 111.6 million at a price of EUR 25 per emission allowance depending on the price of allowances and the time of monetisation.

Waste management sector

In the waste management sector it is planned to provide funding for recycling biodegradable waste by using anaerobic digestion technology for producing biogas, thus also ensuring recovery and efficient use of methane through implementation of the measure 5.2.1.2 “Promotion of waste recycling” of the specific support objective” 5.2.1 “To increase the amount of use, recycling and recovery of various sorts of waste” in the 2014–2020 programming period. For the development of the internal energy market to strengthen the internal energy security and for reducing the use of fossil energy sources projects for waste recovery with energy recovery for infrastructure development will be implemented within the measure 5.2.1.3 “Promoting waste recovery”.

4. CURRENT SITUATION, EXISTING POLICIES AND MEASURES, AND PROJECTIONS

4.1. Projected evolution of main exogenous factors influencing energy system and GHG emission developments

4.1.1. Energy and climate projections model

The total final energy consumption of the country is described in the model by sectors (industry, agriculture, services, households, and transport) and sub-sectors (e.g. of transport and industry), which corresponds to the division in the energy balance. For some sectors (e.g. households, services, road transport) that have not been broken down in the energy balance, the energy consumption is broken down in the model according to the type of service, e.g. heating, cooking, lighting (households and services), buses, passenger cars and commercial vehicles, motorcycles (road transport). The comparison of the final energy consumption in the model and the energy balance is summarised in the table below.

Demand for energy is connected with economic development. Therefore, in order to predict the consumption of net energy, it is necessary to take into account long-term macroeconomic development projections and to identify the set of economic, technical and social factors influencing the demand for each energy service or type of net energy, e.g.:

- the amount of freight transported (tonne-kilometres (tkm) in freight transport);
- passenger mobility (passenger-kilometres (pkm) in passenger transport by a defined mode of transport — road, rail, passenger cars, public transport);
- total area to be heated in the service sector;
- number of households;
- total floor space of dwellings.

Net energy projections are calculated based on the historical correlation between these parameters and macroeconomic indicators and net energy consumption. Namely, net energy consumption in a particular sector in general is linked to added value through the flexibility parameter, i.e. by what percentage the net energy consumption will change as a result of 1 % change in the added value. Future changes in net energy consumption are projected by calculating historical values of flexibilities and by making assumptions on future values.

The final energy consumption is calculated according to the MARKAL-Latvia model (hereinafter — the model). The model used is a demand driven optimisation model, i.e. demand for energy by certain sectors of final energy consumption is ensured by optimising the described energy-environment system to address various needs — energy services that are reflected in the model in the form of net energy demand. Net energy demand is a starting parameter of the model and is projected outside the model based on the model described above. The result of the model is final energy consumption. It should be noted that modelling allows to map the approach to flexible consumption, which means that the flexibility of demand itself is taken into account, i.e. demand for an energy service reacts to price changes in the respective sub-sector.

Existing and supported policies and measures are taken into consideration for describing the baseline scenario and modelling under the assumption that they will be continued also in the period after 2020 (if the policies are in force only in the current programming period for EU funds). Annex 3 provides a short overview of the measures and the characteristics used for their description in the model.

In its essence and scope, the baseline scenario prepared for the Plan is a “scenario with additional measures”, as it includes an assumption that the measures implemented in 2018, e.g. support

measures implemented within the EU funds according to the Law On Management of European Union Structural Funds and the Cohesion Fund for the 2014–2020 programming period, are also implemented in the period after 2021, although these measures are not laid down in the policy planning documents of Latvia and the funding for implementing the measures is not established, as well as an assumption that Latvia will implement the requirements laid down in the EU legislation, e.g. with regard to green public procurement in transport, although measures for meeting these requirements have not been laid down in the policy planning documents or legislation yet.

The scenario included in the Plan is a scenario that combines "implemented policies and measures" and "approved policies and measures", as well as partially includes "planned policies and measures".

All the measures related to the support programmes of EU funds are "planned policies and measures", as funding for these measures will be allocated only after approving the Plan in Latvia (redistribution of the funding to EU Member States will take place only in 2019).

4.1.2. Macroeconomic forecasts (GDP and population growth)

Demand for energy is directly related to the economic development of the country, therefore demand for energy services (net energy) in the future is calculated by using the forecasts of the Ministry of Economics of 2018 on the dynamics of indicators reflecting macroeconomic development (population, GDP, added value by economic sectors and industry subsectors, private consumption).

4.1.2.1. Macroeconomic framework

Forecasts of the macroeconomic indicators are developed based on conservative assumptions and after assessing the risks of the external and internal environment. The main driver of growth is income from exports and expanding opportunities for exports, the ability to become part of international product chains for products with higher added value, and the ability to create high quality final consumption products. It should also be taken into consideration that in an open labour market a considerably sharp increase of labour costs will continue at least in the medium term and competitive advantages of labour costs will continue to decrease. More vigorous development in the medium and long term is expected in sectors that will be able to increase productivity as a result of reducing the gap in technological development, modernising manufacturing and investments, investments in human capital, research and innovation, and other factors of the supply side. Economic development in the baseline scenario will also be influenced by negative demographic trends.

It is expected that the economic growth in the coming years will be strong. More intensive allocation of EU funds will contribute to increased investments in 2018 and 2019. Driven by wage increase and increasing purchasing power, private consumption will remain high. Favourable external environment and higher demand in the main export markets will have a positive impact on exports and development of sectors focused on external markets.

Economic growth will slow down in the medium (2023) and long term (2030). Convergence of wages with Western European countries in the medium term will continue due to the open labour market. As a result, it will have a negative impact on the competitiveness of companies representing low added value segments. At the same time, transition to a higher added value economy will be gradual. Population decline and lower increase of income in the long term will have an impact on private consumption.

Table 11. Changes in macroeconomic indicators in the baseline scenario until 2030 (%, average in the period)

	2017/2015	**2019/2017**	**2023/2019**	**2030/2023**
Population	-0.92	-1.11	-1.29	-1.42
GDP at current prices	5.1	6.7	5.3	4.2

GDP at constant prices	3.4	3.7	2.7	2.1
Private consumption at constant prices	4.2	4.4	2.9	2.1

According to the demographic forecasts, the population of Latvia will continue to decline in the medium and long term. Moreover, the working age population will decline faster than the total number of inhabitants. The main reason for population decline in medium and long term will be ageing population, which will result in an increasing gap between birth and mortality rates.

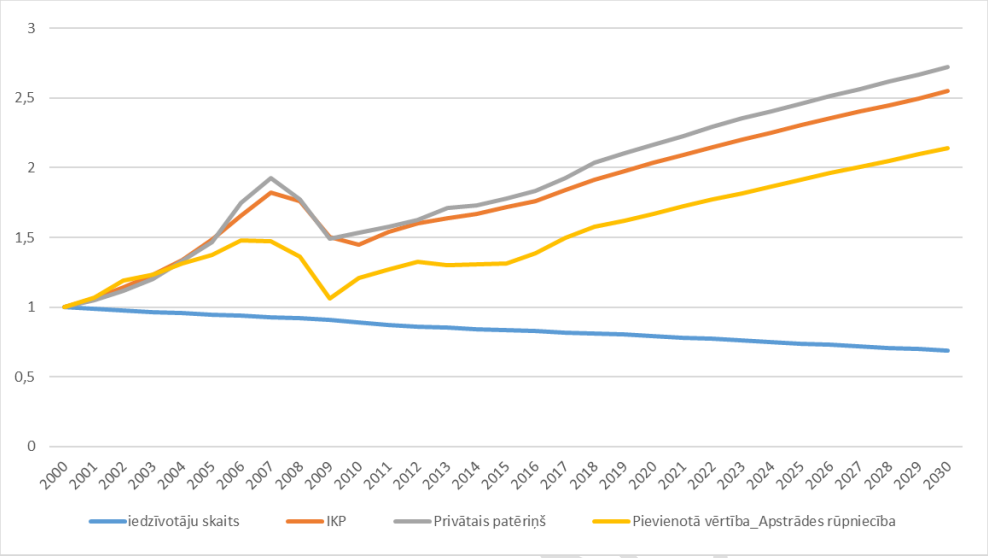


Figure 12. Macroeconomic indicators from 2000 to 2030 (2000=100)[163]

4.1.2.2. Sectoral development trends

According to the baseline scenario, the manufacturing industry will grow faster than economy in general in the medium and long term. At the same time, growth will rather be related to the use of latest technological processes, digitalisation and optimisation of processes than extensive increase of material-intensive production. Sharper growth related to the factors described above is expected in high and medium-high technology fields like chemistry, pharmacy, electronics, etc. Relatively rapid growth is also expected in the largest manufacturing sector — wood processing. The development of sectors that are rather focused on the internal market (e.g. food industry, printing) will primarily be affected by the domestic demand. Non-metallic mineral production will be closely linked to construction trends.

The baseline scenario until 2030 does not consider significant changes in the structure of economic sectors compared to the current situation. It will remain similar to the existing. Although the main driver of growth is exports, it does not mean that the share of exporting industries will increase significantly. The main reason is that the business model has changed substantially in recent years. Every industry requires a great deal of services from other industries (e.g. IT services, logistics and transport, other business services, even account keeping cannot be done directly by a company itself). It means that growth of any industry promotes growth of other industries, especially in business services. The share of commercial services industry could increase by one percentage point by 2030. It is expected that the share of IT, construction and industry in the national economy will also increase, while the share of agriculture, transport, financial services and public services could reduce slightly.

4.1.3. Sectoral changes expected to impact the energy system and GHG emissions

It is not expected that there will be any major sectoral changes in Latvia that could significantly influence the distribution of the energy system or GHG emissions. The expected changes in the

[163] MoE, CSB, IPE

energy system mainly affect the transport sector where transition from fossil fuels to alternative fuels as the energy source is expected. It is also expected that the amount of energy produced and consumed will increase to ensure the implementation of decarbonisation measures, e.g. mobility of the transport sector, as well as to provide the necessary interconnection capacity.

4.1.4. Global energy trends, international fossil fuel prices, ETS carbon price, changes in technology costs

The development of energy prices is an important factor that affects energy consumption trends, as the price the energy user is prepared to pay shows how much energy they want to consume and how much is worth contributing to increasing the efficiency of technologies to provide energy services. Price projections is a starting parameter of the model. Modelling is performed under the assumption that each type of energy source will be available in a sufficient amount to meet the energy demand in the period considered, while the price of acquisition and transport is estimated.

Price estimates for energy sources are made based on the information published in the World Energy Outlook by the International Energy Agency (IEA WEO 2016). Costs for the delivery of energy sources or transport costs in the model have been considered separately for each sector. Costs for the delivery of energy sources include domestic fuel/energy offers, storage of energy sources, filling stations, etc.

Modelling of the energy system considers all existing taxes with the respective rates and assumptions about their development in the future. The EC forecasts for the price of CO_2 in the EU ETS system until 2050 are also taken into consideration in the calculation of projections.

The price of emission allowances is mainly based on market demand and supply but also depends on various developments in the energy sector in Europe, including changes of energy prices in energy markets, weather conditions (e.g. warm winters), developments and decisions in international negotiations (including at the EU level) about climate change, as well as announcements by certain countries.

At the beginning of phase 3 of the ETS the price of the emission allowance was EUR 6 but already on 22 April 2013 it reached the lowest level so far at EUR 2.65 (on the common auction platform). On 24 February 2014, however, the price reached EUR 7.10 per emission allowance. The maximum level in the three preceding years (compared to the previous years) of EUR 8.63 was reached on the common auction platform on 27 October and 24 November 2015. In 2016, the price dropped below EUR 5 per emission allowance again and fell to EUR 3.94 for several days in September 2016, which was the lowest point since the beginning of June 2013. The prices were unstable and ranged between EUR 4 and EUR 6 from October 2016 to September 2017. Since September 2017 there has been a stable upward trend with price per emission allowance reaching EUR 17.50 in July 2018, which has more than tripled during the year.

In 2015 when working on the impact assessment of the Proposal for amending Directive 2003/87/EC[164], the EC projected that the price of one emission allowance in stage 4 of the ETS could be EUR 25.

According to the average estimates[165] of nine leading analysts of the carbon market, the average price could reach about EUR 20 by the end of 2020, EUR 22–30 by the end of 2025, and EUR 26–35 by the end of 2030.

[164] https://ec.europa.eu/clima/sites/clima/files/ets/revision/docs/impact_assessment_en.pdf

[165] 05.07.2018, available at http://carbon-pulse.com/55059/. BNEF, Commerzbank, Energy Aspects, MOL, Nomisma Energia, Thomson Reuters, Vertis, Virtuse, Wattsight.

4.2. Decarbonisation

4.2.1. GHG emissions and removals

4.2.1.1. Current situation of the total GHG emissions

Fulfilment of objectives for Latvia regarding reduction of GHG emissions and CO_2 removals is assessed every year according to Section 52, Paragraph three of the Law On Pollution by preparing the informative report on meeting the commitments of GHG emission reduction and CO_2 removals[166].

According to the 2018 GHG inventory for 1990–2016[167] (hereinafter — 2018 GHG inventory) and a rough GHG inventory for 2017[168], total GHG emissions of Latvia from 1990 to 2016 and 2017 have reduced by 57.3 % and 57.4 % respectively, while in the period from 2005 to 2016 and 2017 total GHG emissions of Latvia reduced by 1.3 % and 1.6 % respectively.

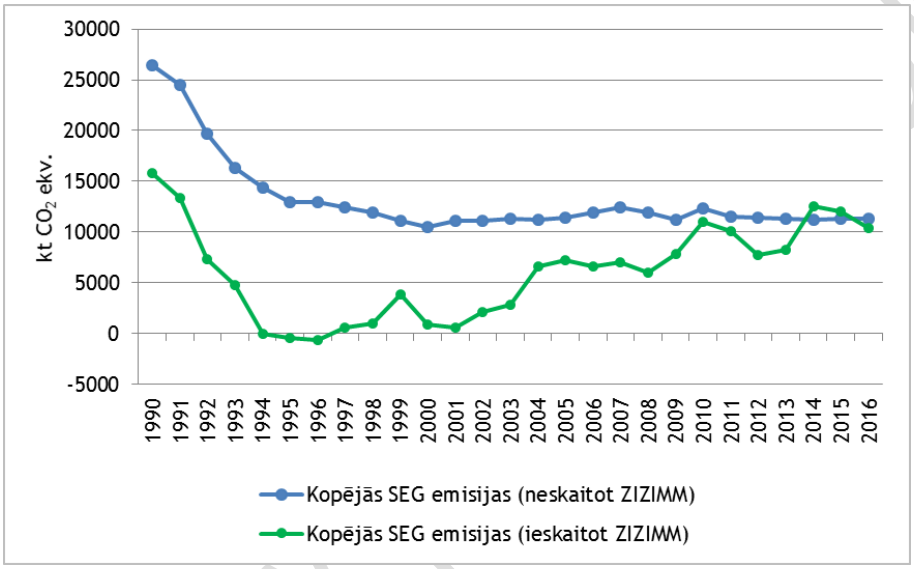


Figure 13. Total GHG emissions of Latvia (including and excluding LULUCF) from 1990 to 2016 (kt of CO2 eq.)

Total GHG emissions of Latvia were 11,306.39 kt of CO_2 eq. in 2016 and approximately 11,275.43 kt of CO_2 eq. in 2017.

[166] The report about meeting the commitments in 2013–2016 and the projected meeting of commitments by 2020 is available at http://polsis.mk.gov.lv/documents/6109. The current report about meeting the commitments in 2013-2017 and the projected meeting of commitments by 2020 will be published by 31 December 2018.
[167] http://cdr.eionet.europa.eu/lv/eu/mmr/art07_inventory/ghg_inventory/envwu6qfa/
[168] http://cdr.eionet.europa.eu/lv/eu/mmr/art08_proxy/envw07vaw/

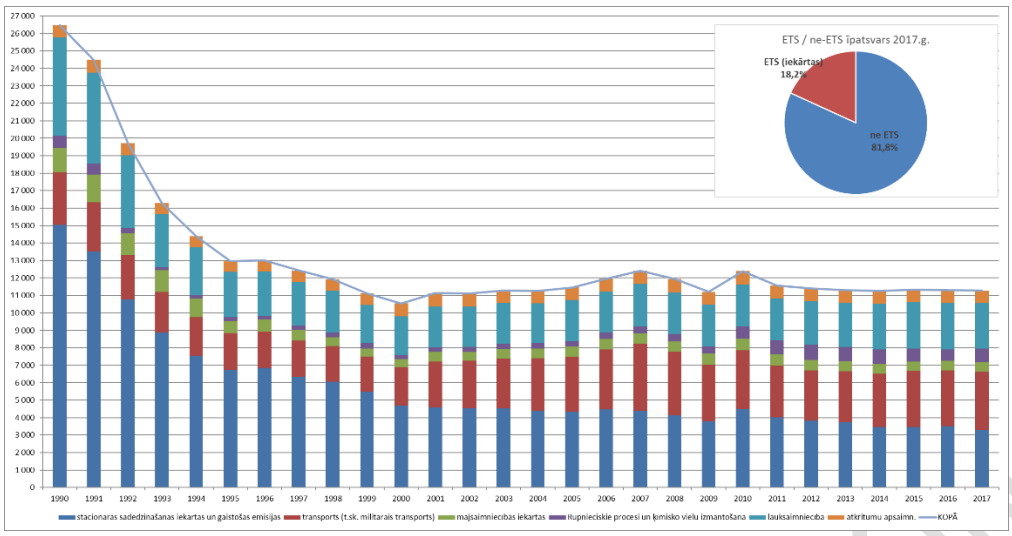


Figure 14. Total GHG emission trends in Latvia from 1990 to 2017 and share of ETS/non-ETS GHG emissions in 2017 (kt of CO_2 eq.)

The energy sector was the biggest source of GHG emissions in 2016 with 64 % of the total GHG emissions in Latvia excluding LULUCF. The vast majority of emissions from the combustion of fuels comes from the transport sector — 44.2 %. Emissions from the energy sector in 2016 reduced by 62.7% compared to 1990 and by 10 % compared to 2005. Emissions from the transport sector have increased by 5.1 % compared to 1990. One of the reasons for changes in the emission rates could be the type of fuel used, as well as the amount of fuel consumed in sectors. The amount of biomass consumed has increased by 114.9 % since 1990, while the share of fossil fuels has reduced — liquid fuels by 60.8 %, solid fuels (except for peat) by 93.6 %, peat by 98.9 %, and natural gas by 53.0 %. The share of biomass has increased from 36.0 % in 2015 to 36.3 % in 2016. Biofuels (biodiesel and bioethanol) make up 1 % of the total fuel consumption in the transport sector.

Agriculture is the second largest sector of emissions according to the GHG inventory of Latvia with 23.6 % (2,663.43 kt of CO_2 eq.) of the total GHG emissions of Latvia in 2016 excluding LULUCF. Emissions from agricultural soils made up the largest part (59.5 %) of the total emissions from the sector in 2016. Total agricultural emissions in 2016 have reduced by about 52.5 % compared to 1990, mainly because of lower agricultural production output, decreased number of livestock, as well as lower production output of crops and reduced consumption of fertilisers. Compared to 2005, agricultural emissions have increased by 13.8 % in 2016. The increase of emissions was facilitated by higher agricultural production rates mainly in crop production as a result of increase in the area sown and the amount of fertilisers used.

GHG emissions from waste management in 2016 amounted to 6.4 % of the total GHG emissions excluding LULUCF. CH_4 emissions from municipal waste disposal made up over a half (53.0 %) of the total GHG emissions in the waste management sector. GHG emissions from the waste management sector remained practically the same in the period from 1990 to 2016. In 2016, GHG emissions from waste management were 3.8 % higher than in 1990 and increased by 0.6 % compared to 2005. Fluctuations in GHG emissions from the waste management sector is the result of changes in the national economy in the last 20 years. The sharp increase of emissions from composting in 2016 by 25.6 % compared to the previous years is related to the increase of industrial biological waste and sorting of biological waste before disposing at a much higher rate.

4.2.1.2. Current situation in reducing emissions from ETS and non-ETS activities

In 2016, GHG emissions from non-ETS activities dominated in the total amount of GHG emissions of Latvia with 80.6 %. The estimated share of GHG emissions from non-ETS activities in the total amount of GHG emissions of Latvia in 2017 was even bigger — 81.8 %. The amount of GHG emissions produced by ETS operators in Latvia was 2,197 kt of CO_2 eq. in

2016 and 2,049.8 kt of CO_2 eq. in 2017 or 19.4 % and 18.2 % of the total amount of GHG emissions of Latvia respectively.

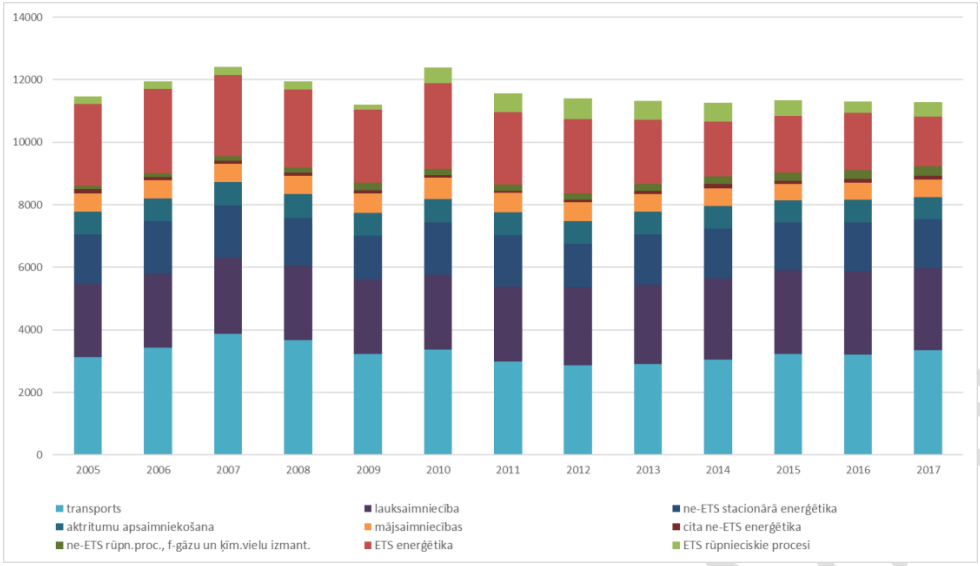


Figure 15. GHG emission trends from non-ETS and ETS activities from 2005 to 2017 (kt of CO_2 eq.)

The development of GHG emissions from non-ETS activities suggests an increase of emissions by 5.9 % from 2005 to 2016 and by 7.2 % from 2005 to 2017. Overall, in the period until 2017 Latvia has met the annual commitments of non-ETS activities laid down by the Decision on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments. Compared to 2005, ETS operators in Latvia have reduced their GHG emissions by 23 % in 2016 and by 28.2 % in 2017 by considerably exceeding the national ETS emission reduction target for 2020 established in EPG2020.

Table 12. Share of GHG emissions from non-ETS activities in Latvia and difference in 2016 (%)

	Share (%)		Difference	
	Total amount of GHG emissions	**GHG emissions from non-ETS activities**	**2005–2016**	**2015–2016**
ETS sector	**19.43**	-	-23.03	-5.0%
ETS energy	16.15	-	-30.48	0.72
ETS industrial processes	3.28	-	62.99	-25.76
Non-ETS activities	**80.57**	**81.82**	**5.89**	**0.97**
Non-ETS energy	48.03	59.61	-0.19	0.84
transport	28.39	35.24	2.61	-0.49
households	4.84	6.01	-7.26	6.75
other non-ETS energy	14.80	18.37	-2.60	1.7
Non-ETS industrial processes and the use of chemical substances	2.56	3.18	186.82	11.12
Agriculture	23.56	29.24	13.84	-0.31
Waste management	6.42	7.97	0.61	3.02
TOTAL			**-1.32**	**-0.25**

4.2.1.3. Current situation in ensuring CO_2 removals

According to 2006 IPCC Guidelines, land areas in the category of land-use, land-use change and forestry (LULUFC) are divided into six land use categories: forest land, cropland, grassland, wetlands, settlements, and other land. The LULUFC sector in Latvia includes emissions and CO_2

removals from the categories mentioned above divided into smaller sub-categories: lands that have not changed their type of land use in the last 20 years and lands that have changed their type of land use in the last 20 years. The category "other land" includes lands that are not managed and do not contain a considerable amount of organic carbon, therefore emissions from such lands are not reported. The LULUFC sector also includes emissions from wood products.

According to the 2018 GHG inventory, the LULUFC sector overall was not a source of GHG emissions in 2016 (CO_2 removals were bigger than the amount of GHG produced in the entire sector), with total CO_2 removals of the LULUFC sector in the amount of -925.3 kt of CO_2 eq. compared to -10,696.68 kt of CO_2 eq. in 1990. The reduction of CO_2 removals is related to increased logging in forest lands, larger amount of deadwood, and smaller increase of living biomass in forest lands, which is determined according to the data of the National Forest Monitoring collected by the Latvian State Forest Research Institute "Silava". Total CO_2 removals have reduced by 91 % in the period from 1990 to 2016. The reduction of CO_2 removals in the LULUCF sector is related to increased logging (more than twofold). Transformation of forest lands into settlements as well as transformation of naturally afforested lands into croplands and grasslands by returning them into agricultural management also contributes significantly to increased GHG emissions.

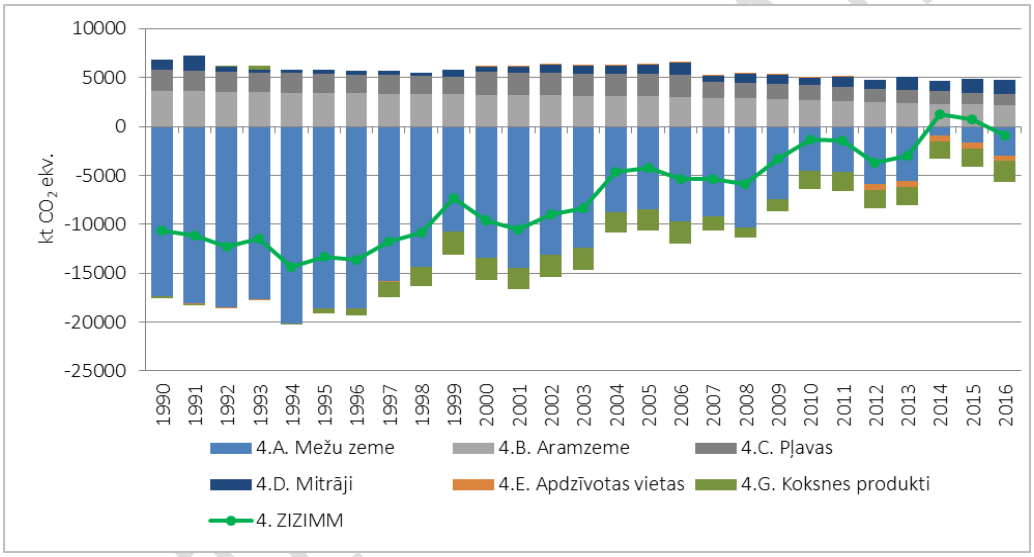


Figure 16. Actual GHG emissions and net CO_2 removals of the Latvian LULUCF sector 1990–2016 (kt of CO_2 eq.)

The change of land use to croplands is mainly related to removing wood biomass from naturally afforested agricultural lands where agricultural activity was suspended in 1980s and 1990s. The increase of living biomass in forest lands that do not change their type of land use and in afforested lands is still bigger than carbon losses due to commercial logging and natural formation of deadwood, therefore the total stock of living biomass in forest lands is continuing to grow.

Forest management and use of forest products is an important contribution to implementing the climate policy of Latvia and meeting international GHG emission reduction commitments of Latvia, as well as promotes the use of local energy sources that are more efficient and better for the environment.

4.2.1.4. GHG intensity trends of the Latvian economy

One of the most common indicators used to evaluate the correlation between economic growth and GHG emissions is GHG intensity[169], which allows to assess how and whether changes in the amount of GHG emissions impact changes in gross domestic product (GDP). i.e. whether development of the economy also means increased GHG emissions.

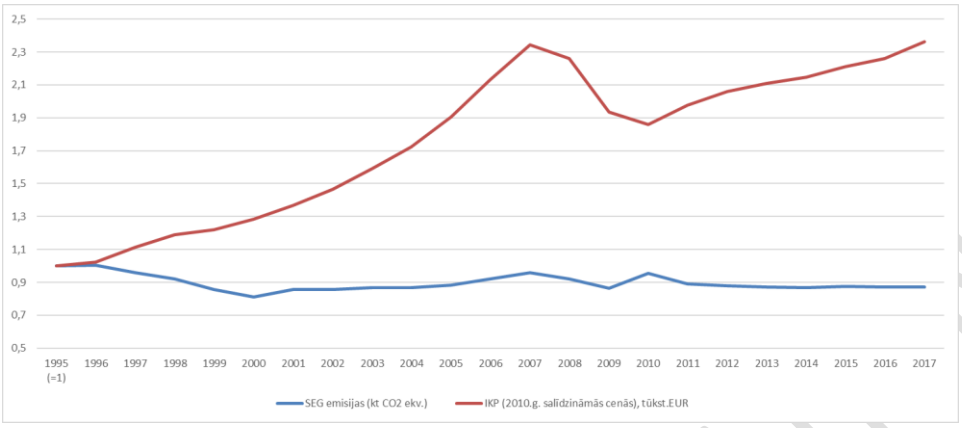


Figure 17. GHG emission and GDP development trends of Latvia (1995=1)[170]

The available data suggest that the total amount of GHG emissions of Latvia reduced by 1.6 % in the period from 2005 to 2017 , while the GDP of Latvia increased by 24 % from 2005 to 2017. Although the increase of GDP was quite sharp and the total amount of GHG emissions has slightly decreased, the economic development of the country is still accompanied by increasing GHG emissions. Thus it can be concluded that decoupling GHG emissions and GDP of Latvia is almost relative[171] as the environmental indicator of decoupling — the amount of GHF emissions — is decreasing only slightly. However, GHG intensity of the economy has been reducing since 1995 and it is predicted that it will continue in the period until 2030.

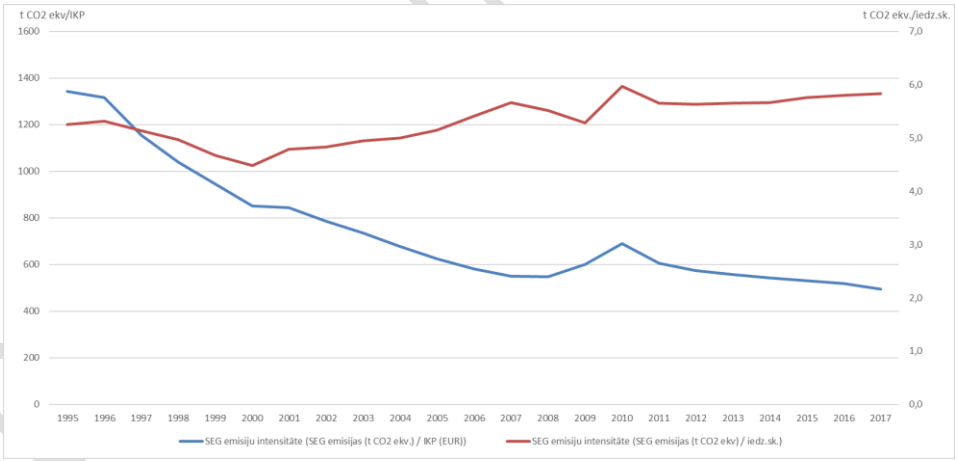


Figure 18. GHG intensity trends of the Latvian economy 1995–2017 — GHG emissions in relation to GDP (left axis) and population (right axis)[172]

4.2.1.5. Climate funding measures implemented

CCFI was launched in 2009 after the first agreements within the international emissions trading were concluded about selling a certain amount of units — a total of nine agreements, including with several independent and private buyers, thus acquiring about EUR 208 million,

[169] The ratio of GHG emissions produced to GDP or GHG intensity shows how efficiently economic sectors limit emissions by producing goods and services for human consumption. GHG intensity in countries with heavy industry as the dominating sector can be higher than in countries with services as the main driving force of the economy even if their energy efficiency is the same.
[170] Data source: 2018 GHG inventory, rough GHG inventory for 2017, CSB
[171] http://www.oecd.org/environment/indicators-modelling-outlooks/1933638.pdf
[172] Data source: 2018 GHG inventory, rough GHG inventory for 2017, CSB

EUR 204 million of which are intended for funding projects and about EUR 4 million for covering expenses related to administering the projects. The funding can only be used for measures that ensure reduction of GHG emissions and climate change mitigation.

The CCFI funding was allocated according to protocol decisions of the Cabinet of Ministers and used to organise open tenders for project applications (hereinafter — tender) pursuant to the approved Cabinet Regulations. The CCFI funding was allocated to 16 different tenders.

56 % of the total available CCFI funding (EUR 107.5 million) were allocated to project implementation in tenders with complex solutions, i.e. support is provided for both implementing energy performance measures in buildings and installing renewable energy technologies ("Complex solutions for greenhouse gas emission reduction in state and municipal vocational education establishment buildings", "Complex solutions for greenhouse gas emission reduction in manufacturing buildings", "Complex solutions for greenhouse gas emission reduction in municipal buildings", and "Complex solutions for greenhouse gas emission reduction"). 26 % (EUR 53.15 million) were allocated to project implementation in tenders for the support of energy efficiency measures ("Increase of energy performance in municipal buildings", "Increase of energy performance in higher education establishment buildings", "Low energy consumption buildings", and "Reducing greenhouse gas emissions in lighting infrastructure of municipal public territories"). 12 % (EUR 24.222 million) were allocated to project implementation in tenders with the aim of transitioning from technologies that use fossil fuels to technologies that use renewable energy ("Technology conversion from fossil to renewable energy sources", "Use of renewable energy resources in household sector", and "Use of renewable energy resources for reduction of green house gas emissions"); 2 % (EUR 4.82 million) were allocated to project implementation in tenders for technology development and raising public awareness ("Development of technologies reducing greenhouse gas emissions and implementation of pilot projects", "Raising of public awareness regarding the importance and possibilities of greenhouse gas emission reduction", and "Development of technologies reducing greenhouse gas emissions and implementation of pilot projects"); 2 % (EUR 2.95 million) were allocated to project implementation in the tender "Reducing greenhouse gas emissions in transport sector — support for introducing electric cars and charging infrastructure".

More information about the tenders organised within the CCFI is available in annual informative reports about the functioning of the Climate Change Financial Instrument in a specific year.

According to the specific support objective 4.2.2 "To facilitate the increase of energy efficiency and use of RES in municipal buildings in accordance with the integrated development programmes of local governments" of the operational programme "Growth and Employment", support to municipal buildings in the 2014–2020 programming period for EU structural funds and the CF is provided in installing heat sources using renewable energy, e.g. solar collectors, solar batteries, heat pumps, with a condition that such activities ensure transition from using fossil fuels to using renewable energy. According to this operational programme, projects of the specific support objective 4.2.2 will ensure additional capacity of renewable energy of at least 1.8 MW.

4.2.1.6. Indicative development projections

It is estimated that the amount of GHG emissions from non-ETS activities will increase to 85 % of the total amount of GHG emissions by 2030 compared to 81 % in 2016. The total amount of GHG emissions from non-ETS activities is estimated to reduce by 5 % from 2005 to 2030. The majority of non-ETS emissions in 2005 and 2030 come from transport (36 % and 32 % respectively), agriculture (27 % and 38 % respectively) and non-ETS energy sectors (27 % and 23 % respectively) (including industry, services, households, agriculture, forestry).

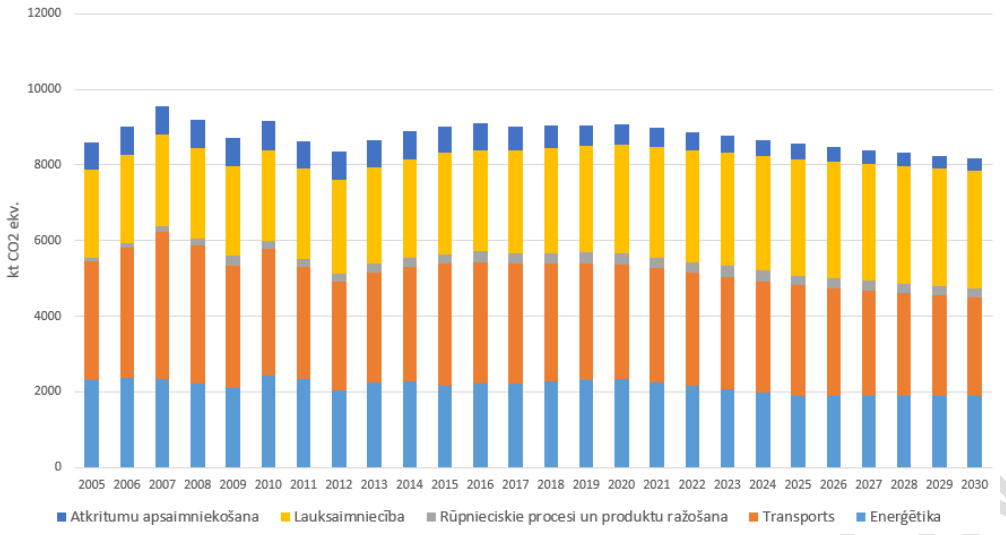


Figure 19. Indicative projections of non-ETS GHG emissions in Latvia until 2030

According to the indicative projections, the amount of GHG emissions from non-ETS sectors in 2030 will be 8,158.78 kt of CO_2 eq., which is 75.13 kt of CO_2 eq. or 0.93 % more that the indicative GHG target for 2030 (8,083.64 kt of CO_2 eq.).

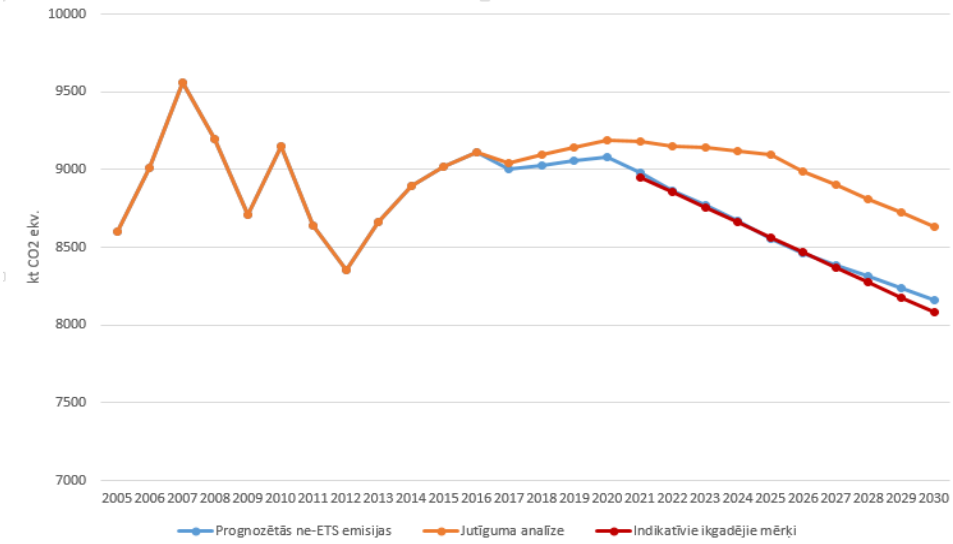


Figure 20. Actual GHG emissions from non-ETS activities (until 2016) and indicative projections of GHG emissions

The main policies influencing the indicative projections of emissions from the energy sector are renewable energy policy and energy efficiency policy. The main drivers of the reduction of GHG emissions in the sector are energy efficiency measures in households and services. Reduction of GHG emissions in general-purpose combustion plants is mainly influenced by the implementation of energy efficiency measures at final energy consumers and replacement of fuel with RES. Reduction of GHG emissions in households is partially influenced by the projection about population decrease.

The main source of GHG emissions in the transport sector is road transport with over 90 % of the total emissions from the sector. Although it is predicted that mobility rates (passenger turnover and freight turnover) will increase by 2030, fuel consumption will decrease due to the replacement of passenger cars used in Latvia with more efficient vehicles. Reduction of GHG emissions in addition to reduction of fuel consumption is also related to wider use of alternative and renewable fuels.

The largest reduction of emissions in the agricultural sector by 2030 is predicted in emissions from manure management (by up to 10 %) and soils (by up to 11 %). Emissions from liming will increase significantly (by up to 40 %), which is directly related to data projections about the use of liming materials.

Non-ETS GHG emissions in the waste management sector will gradually reduce from 618 (in 2016) to 326 kt of CO_2 eq. in 2030 and 245 kt of CO_2 eq. in 2040. The biggest contributor to GHG emissions at the beginning of the period is the sub-sector of waste disposal (composting and recycling of waste is expected to grow), while at the end of the projection period it is waste water treatment where emissions are reducing gradually but not as quickly as in waste disposal.

4.2.2. Renewable energy

4.2.2.1. The existing situation in the use of renewable energy

The total consumption of RES in Latvia was 68.7 PJ in 2016 and 80.5 PJ in 2017, which is an increase of 30.1 % compared to 2005. The consumption of biogas (landfill gas, sewage sludge gas, other biogas) has increased substantially — within ten years it has grown by a factor of 12.7 to reach 3.8 PJ in 2016. The total consumption of woodfuel has increased by 9.3 % in ten years and has reached 54.3 PJ in 2016. Although woodfuel (firewood, wood residues, woodchips, wood briquettes, wood pellets) is the most common RES in Latvia, the share of woodfuel in the consumption of RES has decreased by 4.4 percentage points in five years to reach 74.0 % in 2017. The consumption of biogas (landfill gas, sewage sludge gas, other biogas) is continuing to increase — within five years it has grown by 44.7 % to 3.9 PJ in 2017.

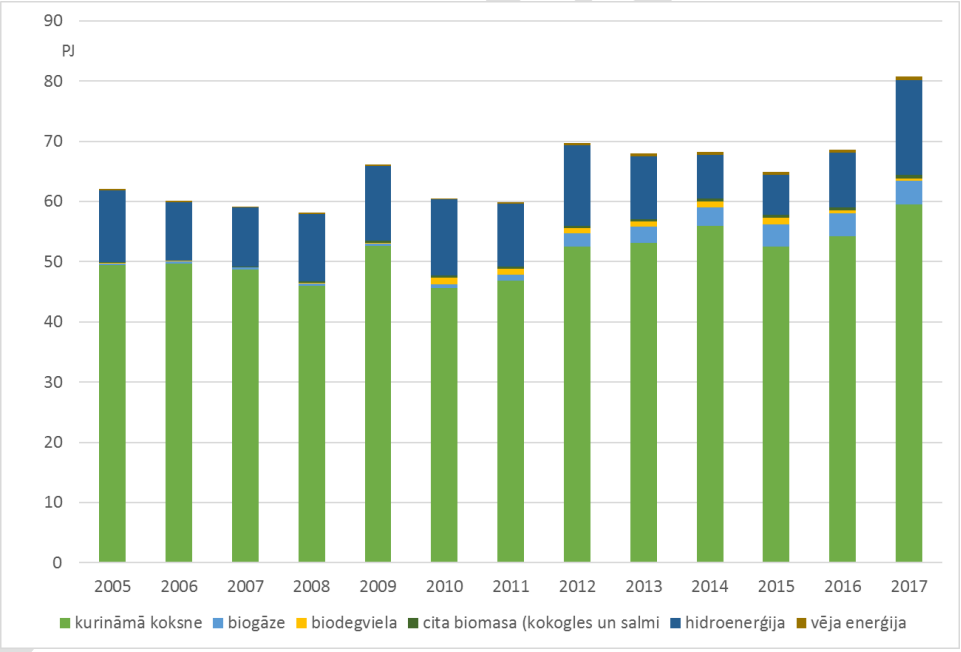


Figure 21. Total consumption of RES in Latvia 2006–2017 (PJ)[173]

The biggest consumers of woodfuel are still households, although their consumption reduced by 41.6 % in ten years and made up 34.6 % of the total woodfuel consumption in 2016. Their consumption in 2017 was 35.5 % of the total woodfuel consumption, a 12.2 % increase compared to 2016 due to the cold winter. Consumption of woodfuel in industry and construction was 2.7 times larger in 2016 compared to 2006 and the consumption in these sectors last year amounted to 25.4 % of the total woodfuel consumption.

[173] Data source: CSB

The share of woodfuel consumed in the transformation sector for the production of electricity and heat increased by 18.6 % and reached 33.1 % of the total consumption in the transformation sector in 2016.

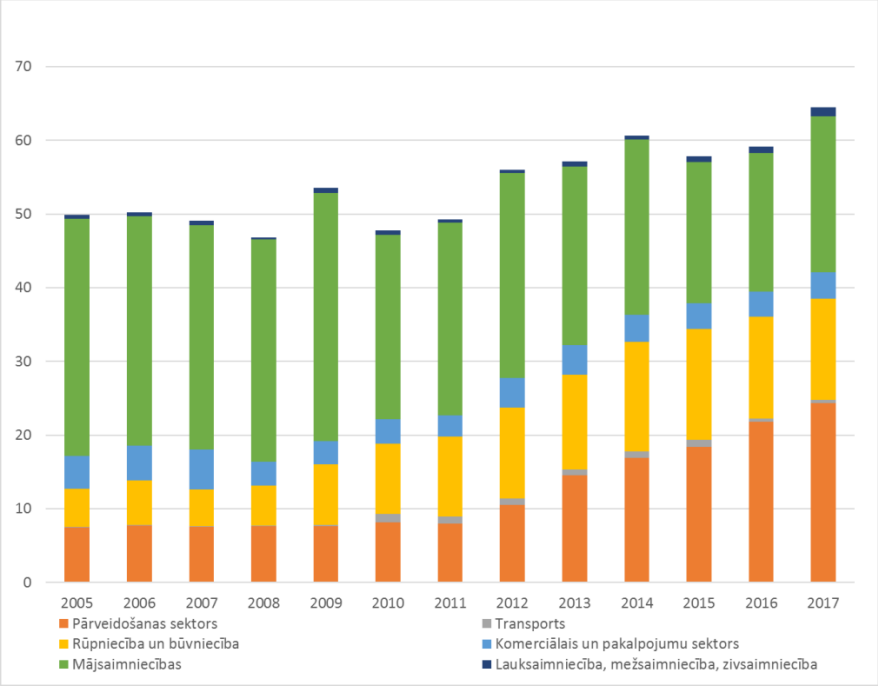
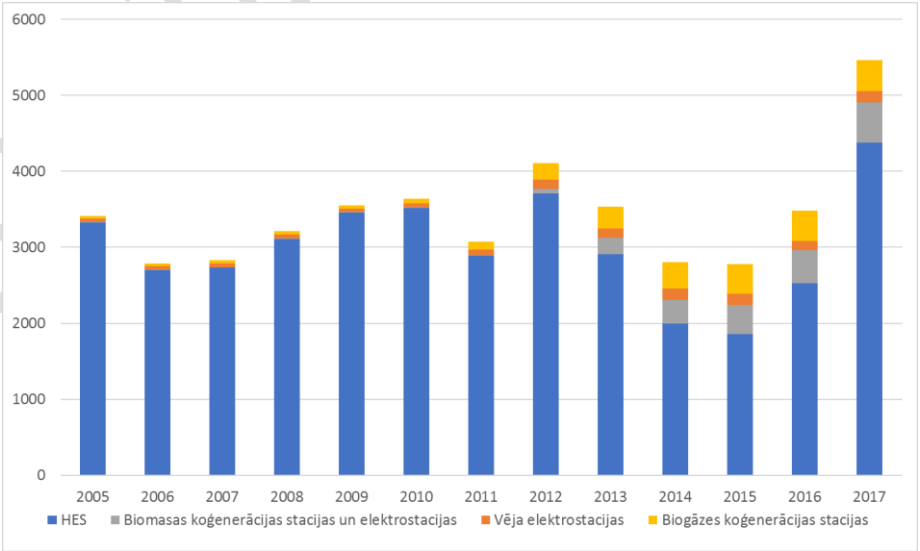


Figure 22. Consumption of renewable energy (solid, gaseous and liquid biomass) in Latvia by industry 2005–2017 (PJ)[174]

In 2017, Latvia produced 7,531 GWh of electricity, 5,461 GWh of which was renewable energy, with the share of renewable energy produced increasing by 56.8 % compared to 2016. The production output of primary electricity increased substantially — by 70.5 % or 6.7 PJ (73.2 % increase in HPPs and 17.1 % increase in WPPs). The increase of electricity generation in 2017 was mostly influenced by high output of HPPs due to the high precipitation and the high inflow of water in the Daugava. In five years, the amount of electricity produced increased from 215 to 525 GWh in biomass power plants and cogeneration plants and from 288 to 405 GWh in biogas cogeneration plants.



[174] Data source: CSB

Figure 23. The amount of electricity produced from RES in Latvia 2006–2017 (GWh)[175]

4.2.2.2. The existing situation in the use of renewable energy in transport

Only 1.5 % or 0.77 PJ of the total amount of energy used in transport was RE and electricity in 2017. The use of RE in transport has increased by 19.5 % compared to 2005, but it has decreased dramatically compared to 2010 — by 51.9 %.

There is a legal requirement as of 1 October 2009 to add 5 % of biofuel to fossil fuels. 95 RON petrol can be sold only with bioethanol in the amount of 4.5–5 % Vol. of the total volume of petrol, but this requirement does not apply to petrol used in aviation transport engines and 98 RON petrol. Diesel can be sold only with biodiesel from rapeseed oil of 4.5–7 % Vol. of the total volume of the mixture or with paraffinised diesel from biomass of at least 4.5 % Vol. of the total volume of the mixture. This requirement does not apply to diesel sold from 1 November to 15 April and diesel used in the engines of ships of maritime transport fleets and aviation transport engines.

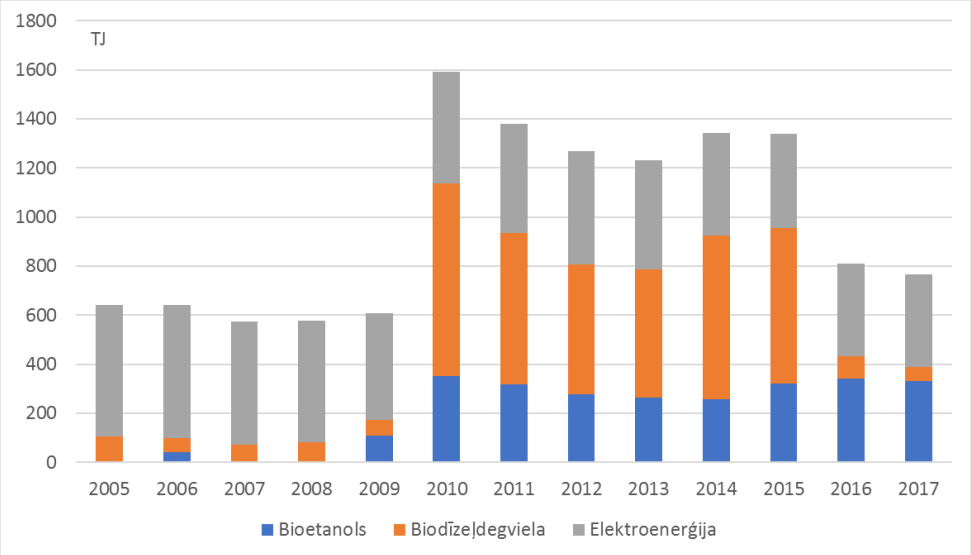


Figure 24. Use of renewable energy in transport 2005–2017 (TJ)[176]

Now that there are over 400 EVs roadworthy in Latvia (the total number of EVs registered in Latvia as at 1 July 2018 was 479), it is possible to analyse the patterns of use of such vehicles. According to the population survey in Latvia, if a family could afford another car, the first choice would be an electric vehicle. A major obstacle to the development of electric mobility is the low rate of GDP per capita as well as low personal income compared to other ES Member States. The inhabitants of Latvia have noted in the surveys that the main obstacle for purchasing an electric vehicle is the high price that does not outweigh the benefits it provides. Even the insufficient development of the charging infrastructure is not that big of an obstacle as the price.

The users of EVs have the following benefits:

- EVs are exempt from vehicle operation tax;
- reduced company car tax rate — EUR 10.00 (previously: EUR 42.69 per month);
- the first registration of an EV as well as registration to receive special vehicle registration number plates for the first time is free of charge;
- the first set of special registration number plates is free of charge;

[175] Data source: CSB
[176] Data source: CSB

- EVs with such number plates can use public transport lanes;
- additional support measures have been introduced in some municipalities, e.g. parking electric vehicles in metered street parking spaces in Liepāja and Rīga is free of charge and electric vehicles entering Jūrmala are exempt from the fee for entering the administrative territory of the city.

4.2.2.3. Fulfilment of the 2020 target of the share of RE of Latvia

The share of RE in the total final energy consumption was 37.2 % in 2016, an increase of 15 % compared to 2005. However, the share of RE has been reducing since 2014 — from 38.7 % in 2014 to 37.6 % in 2015 and 37.2 % in 2016. Considering the reduction of the total final energy consumption, however, the share of RE remained above the indicative curve for reaching the 2020 target. Reduction of the share of RE was mainly influenced by the following factors: 1) weaknesses in legislation that resulted in reduced share of fuel with added biofuels; 2) adverse weather conditions, especially in 2015, which reduced both total energy consumption in heat supply and RE consumption; 3) HPP reconstruction in 2016, which resulted in reduced HPP power and influenced the normalised data regarding the electricity generated by the HPP.

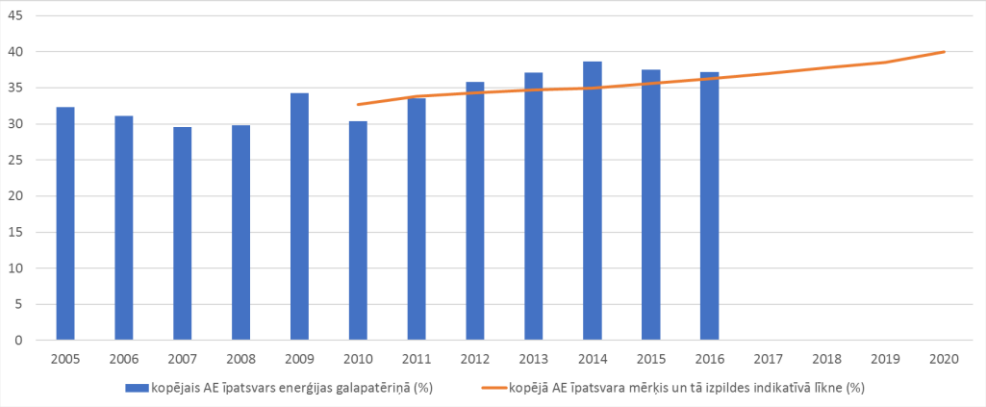


Figure 25. Total share of RE in the final energy consumption of Latvia and fulfilment of the RE target (2005–2016)[177]

Regarding the sectoral targets of the share of RE it can be concluded that Latvia has almost fulfilled the target of the share of RE in heating and cooling established in the REAPRL[178] plan already in 2016 and only an increase of 1.55 percentage points in the share of RE is required to fulfil the target. However, in order to meet the target established by the REAPRL for the share of RE in electricity and the EU target for the share of RE in transport, Latvia has to increase the share by 8.5 and 7.2 percentage points respectively.

[177] Data source: CSB, EUROSTAT
[178] https://ec.europa.eu/energy/sites/ener/files/documents/dir_2009_0028_action_plan_latvia.zip

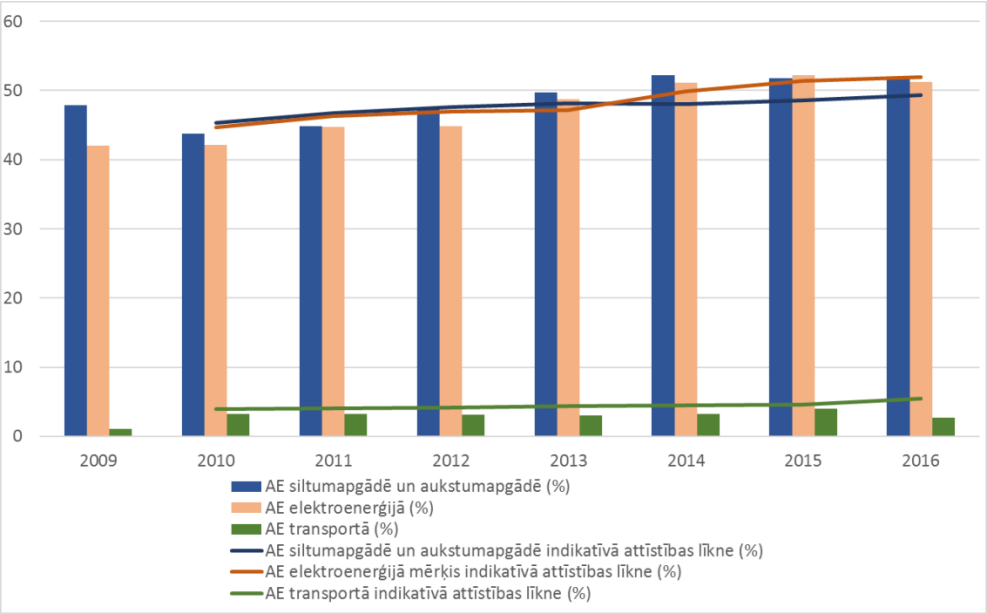
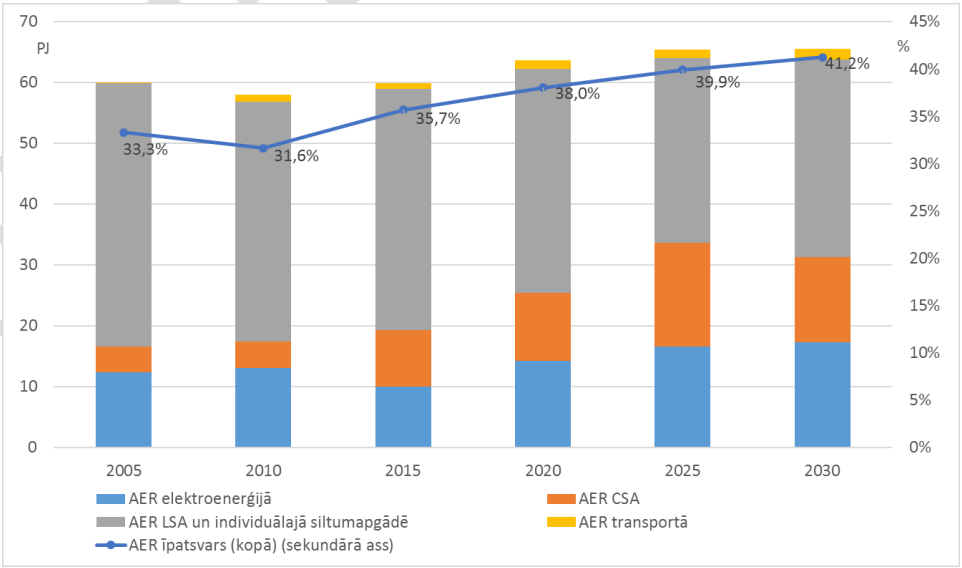


Figure 26. Share of RE in the final energy consumption of Latvia by sector and fulfilment of the target regarding the indicative development curve of RE (2005–2016)[179]

Progress in the fulfilment of targets for energy produced from RES for Latvia is assessed every two years pursuant to Article 22(1) of Directive 2009/28/EC[180] by preparing a report about the progress in the fulfilment of EC targets[181].

4.2.2.4. Indicative development projections

The baseline scenario predicts that, considering the current policy, the existing support for producing electricity from RES is gradually decreasing. Under this condition and assumptions about the prices of fossil energy and costs of technologies (using RES and fossil fuels) until 2030, the share of RES estimated in the baseline scenario in the period until 2030 is about 40 % and reaches 41 % at the end of the period. The assumptions about the price projection of fossil fuels and the costs of RE technologies suggest that the use of RE after 2030 will become more profitable from the point of view of total costs of the energy system and the share of RE in the baseline scenario will reach 55 % by 2050.



[179] Data source: CSB, EUROSTAT
[180] Directive 2009/28/EC
[181] The current report about the progress of Latvia in meeting the commitments is available at https://www.em.gov.lv/files/nozares_politika/EMZino_AER_030518.pdf.

Figure 27. Share of RE in the final energy consumption (%) and indicative development projections of the share of RE until 2030 (PJ)[182]

It should be noted that the increase of the share of renewable energy in DH in the period after 2020 is forecast based on the assumption that the use of biomass cogeneration facilities will increase significantly. However, considering the existing system of policies and measures planned, it can be concluded that the development of biomass cogeneration is not going to be as rapid as it is predicted in the model. Therefore this information will be updated in the final version of the Plan by defining restrictions for the development of biomass cogeneration.

Considering the existing policies and measures implemented, as well as the unclear policy regarding the promotion of the use of RE, the projections of the baseline scenario suggest that the total share of RE in the energy balance of Latvia will be reached by 2020, will remain stable in the period after 2020, and will reach 40.1 % by 2030, which is about 1 % more than in 2020.

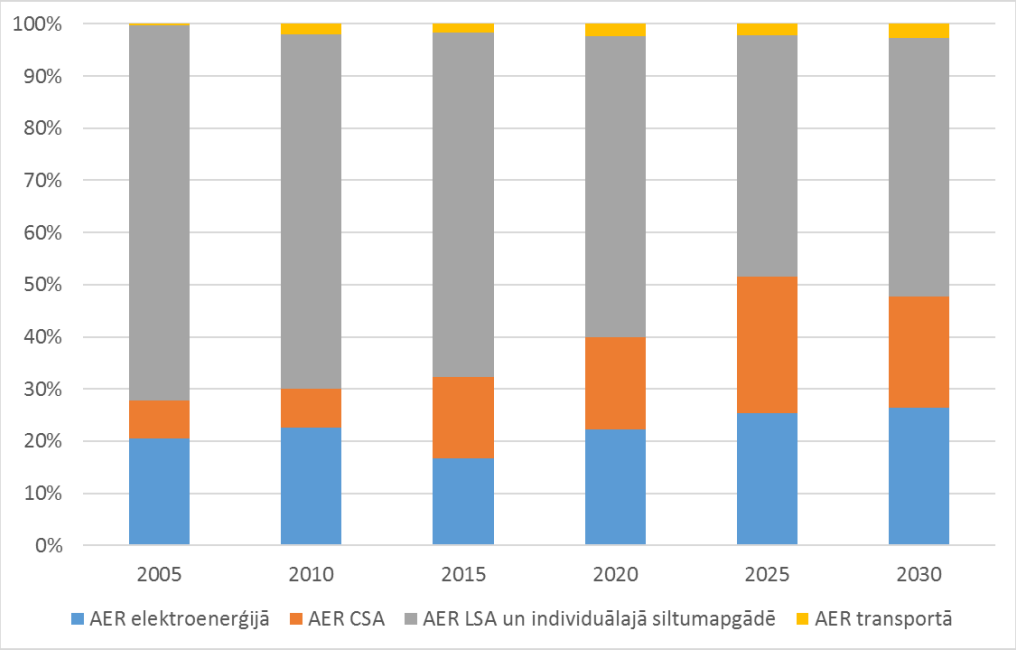


Figure 28. Indicative development projections of the division of the share of RE until 2030[183] (%)

According to the baseline scenario, after 2020 there will be a gradual increase of contributions of RE in electricity, DH and transport to the overall RE target, while the contribution of RE in LH and individual heating will decrease. The reason for this trend is that the share of RE in LH and the share of individual heating mainly depends on the consumption of biomass and other types of RES by households, services, and industry. Final energy consumption in households and services reduces according to the baseline scenario, therefore also the contribution of the share in the total consumption of RE reduces.

4.3. Energy efficiency

4.3.1. Current energy consumption

4.3.1.1. Current total primary energy consumption

The total primary energy consumption was 184.5 PJ in 2016 and 194.9 PJ in 2017[184]. The total primary energy consumption has not changed significantly during the last five years from 2011 to 2016, but the share of RE has increased.

[182] IPE
[183] IPE
[184] CSB

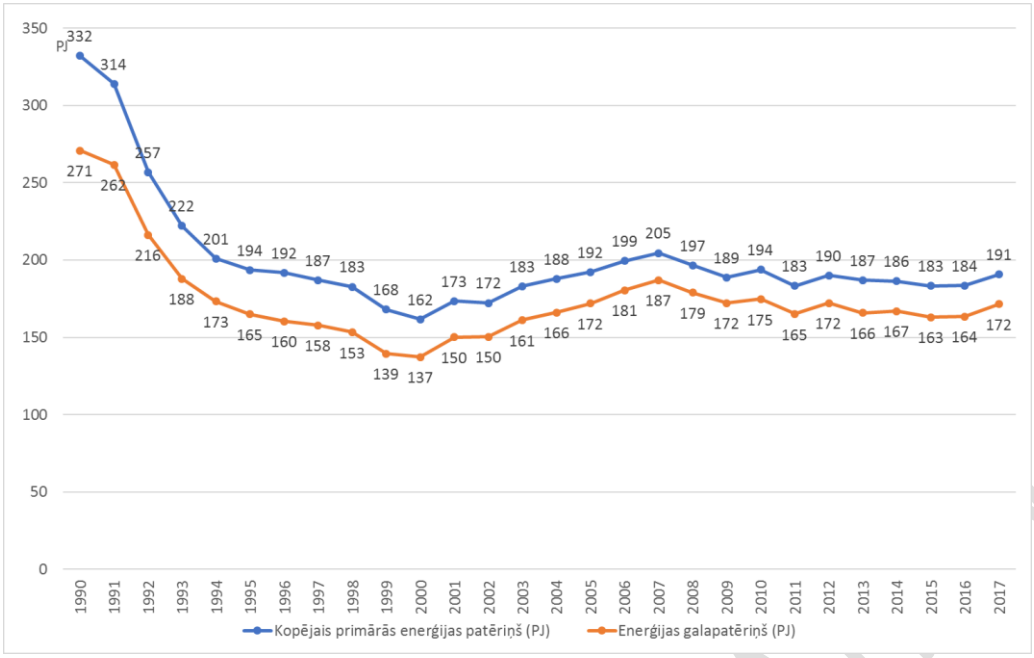


Figure 29. Total primary energy consumption and final energy consumption in Latvia 1990–2017 (PJ)[185]

One of the indicators for reaching the energy efficiency target is the reduction of primary energy consumption. According to the definition set out in Directive 2012/27/EU, primary energy consumption means gross inland consumption, excluding non-energy uses.

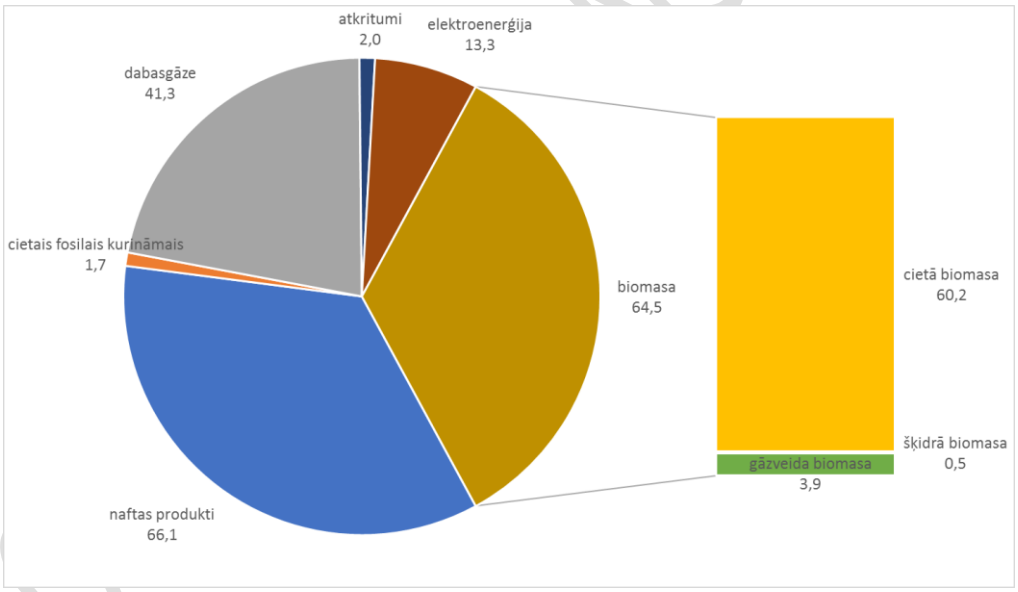


Figure 30. Total primary energy consumption in Latvia in 2017 (PJ)[186]

The production of heat and electricity (transformation sector) required 53.0 PF of energy resources to produce 40.8 PJ of energy (of which 30.0 PJ was heat and 10.8 PJ was electricity) in 2017, which is 4.1 % less compared to 2016 (54.3 PJ of energy resources used to produce 42.5 PJ of energy (of which 29.0 PJ was heat and 13.5 PJ was electricity). The reduction of the amount of energy produced in the transformation sector is related to the increase of the amount of electricity produced by HPPs and WPPs. The main source for producing heat and electricity in Latvia is fossil fuel — natural gas, the share of which in the transformation sector is decreasing gradually: 81 % in 2010, 60,1 % in 2016, and 56.1 % in 2017. The share of RES in the

[185] Data source: CSB
[186] http://data1.csb.gov.lv/pxweb/lv/vide/vide__energetika__ikgad/ENG020.px

transformation sector increased to 43.5 % in five years (39.5 % in 2016). RES used in the transformation sector are local energy sources: woodfuel, biogas, and other types of biomass.

4.3.1.2. Current final energy consumption

Another energy efficiency target is related to the total final energy consumption in the economy broken down by sectors.

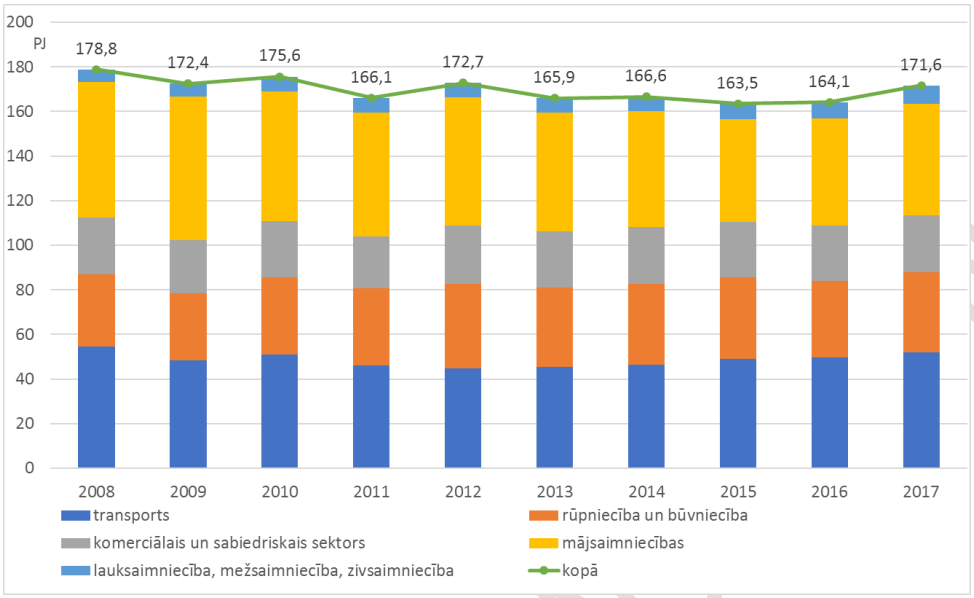


Figure 31. Final energy consumption of Latvia by sectors in 2016[187]

Compared to 2015, final energy consumption in 2016 remained stable at 163.6 PJ, while in 2017 it increased to 172 PJ. Significant changes in the final energy consumption have not been observed in the last ten years. The largest energy consumer in 2016 and 2017 was the transport sector with 30.3 % and 30.3 % respectively, followed by households with 29.2 % and 29.2 % and industry with 20.8 % and 20.9 %. Compared to 2016, increase in the final energy consumption in 2017 was observed in all sectors with the sharpest growth of +10.9 % in agriculture, forestry, and fisheries.

Energy consumption in industry has remained practically stable in the last five years. It has reduced by 1.5 % since 2014 and reached 35.9 PJ in 2017 (34.1 PJ in 2016). The largest consumption in 2016 and 2017 was registered in the manufacturing of wood and cork products — 18.8 PJ or 55.2 % of the total final energy consumption in industry in 2016 and 19.7 PJ or 54.2 % of the total final energy consumption in industry in 2017. Energy consumption in this sector increased by 4.7 % in comparison with 2016 as a result of higher production output of wood briquettes and wood sheets. In comparison with 2015, the largest reduction in 2016 was registered in construction (-26.5 %). The largest reduction of final energy consumption in 2017 was registered in metal fabrication (-34.7 %) in comparison with 2016.

The total final energy consumption in the services sector increased by 1.3 % in 2016 compared to 2015 and by 2.1 % in 2017 compared to 2016. Electricity consumption accounts for approximately 40 % of energy consumption in the sector and remains almost unchanged. Similarly to the household sector, the main reason for the increase in energy consumption was a significantly higher number of heating degree days in 2016 in comparison with 2015 (16 %). When climate correction is applied to take account of the impact of the number of heating degree days on energy consumption for heating purposes, consumption of energy in the services sector shows a decrease in 2016 in comparison with 2015.

[187] Data source: CSB

Final energy consumption in households in 2017 was 50.1 PJ, 4.6 % more than in 2016 (47.9 PJ in 2016). The structure of final energy consumption in households has not changed substantially in the recent years — woodfuel has been used predominantly. The consumption of natural gas has decreased significantly (-10.9 %) and the consumption of electricity has increased (+8.1 %) in comparison with 2016. Since fuel in households is mostly used for heating the buildings, energy consumption depends to a great extent on the number of heating degree days. When climate correction is applied to take account of the impact of the number of heating degree days on energy consumption for heating purposes, consumption of energy in households shows a decreasing trend over the past five years. This is a result of energy efficiency improvement measures involving renovation of buildings.

4.3.1.3. Energy efficiency in transport

Dependency of road transport on petroleum resources is approximately 94 %of the total energy usage. Considering the current trends and policy decisions made, it is expected that petroleum resources and its products will remain the main energy source for road transport in Latvia in the medium and long term. Energy consumption in transport has increased by 14.6 % in the period from 2012 to 2017 and amounts to 51.9 PJ in 2017. The main reason for the increase in fuel consumption in road transport was an almost 3 % increase in the number of passenger cars and a 2.1 % increase in passenger kilometres in 2016 in comparison with 2015.

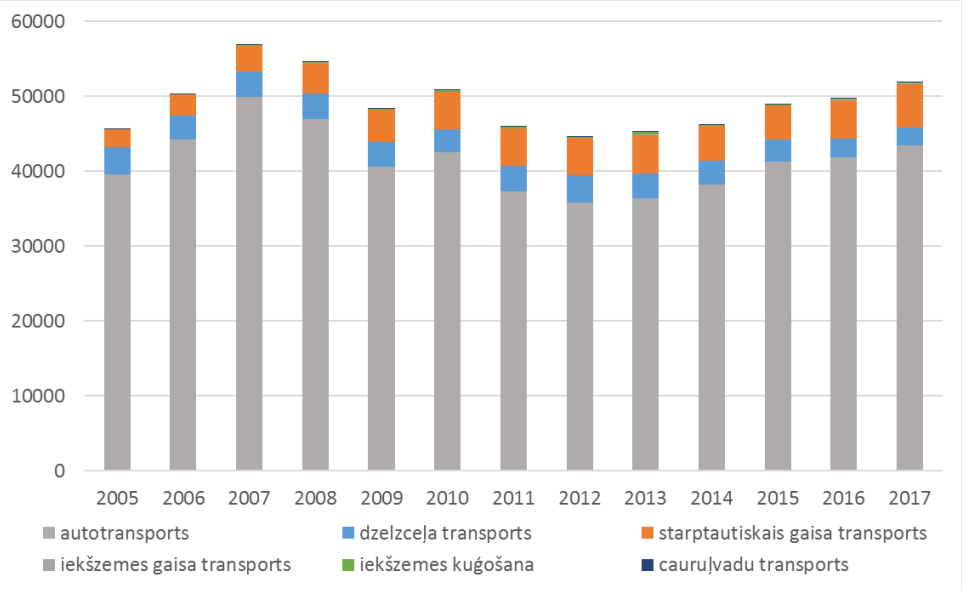


Figure 32. Final energy consumption in transport sectors 2005–2017 (TJ)[188]

92 % of vehicles in Latvia rely on fossil fuel (petrol, diesel). Diesel is the main energy source used in transport with a share of 63.3 % in 2016 and 65.4 % in 2017. Diesel is an important source of fuel for freight transport, which is an important economic sector in Latvia considering its geographic location. It should be noted that according to the observations of transport companies the fuel consumption of trucks within the EU has not improved significantly in the last decade. Diesel is a very important resource for the development of the agricultural industry. Increase of the share of the consumption of liquefied petroleum gas has not been observed in the transport industry in the recent years. Its consumption was 1 PJ in 2010, 2.6 PJ in 2016, and 2.4 PJ in 2017. Petrol consumption of cars has reduced by 8.6 % in the last five years and reached 8 PJ in 2017, which was 4 % less than in 2016 (at 8.4 PJ).

[188] CSB

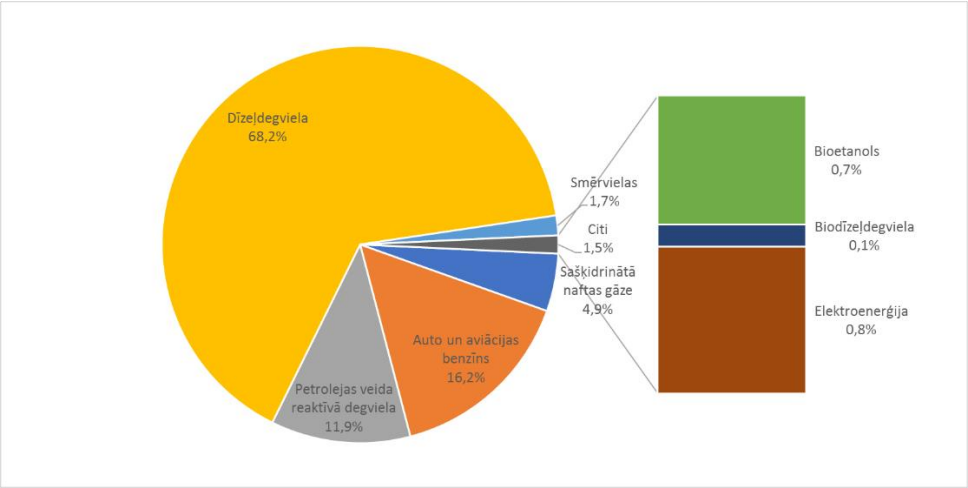


Figure 33. Share of energy consumption in transport in 2017 (%)[189]

Latvia has the fourth oldest vehicle fleet in the EU with the average age of vehicles of 13.95 years (light vehicles — 14.19 years) in 2016, while the average age of vehicles that are roadworthy (roadworthiness test passed) was 12.92 years (light vehicles — 13.17 years). The average age of vehicles in the EU in 2014 was 9.7 years.

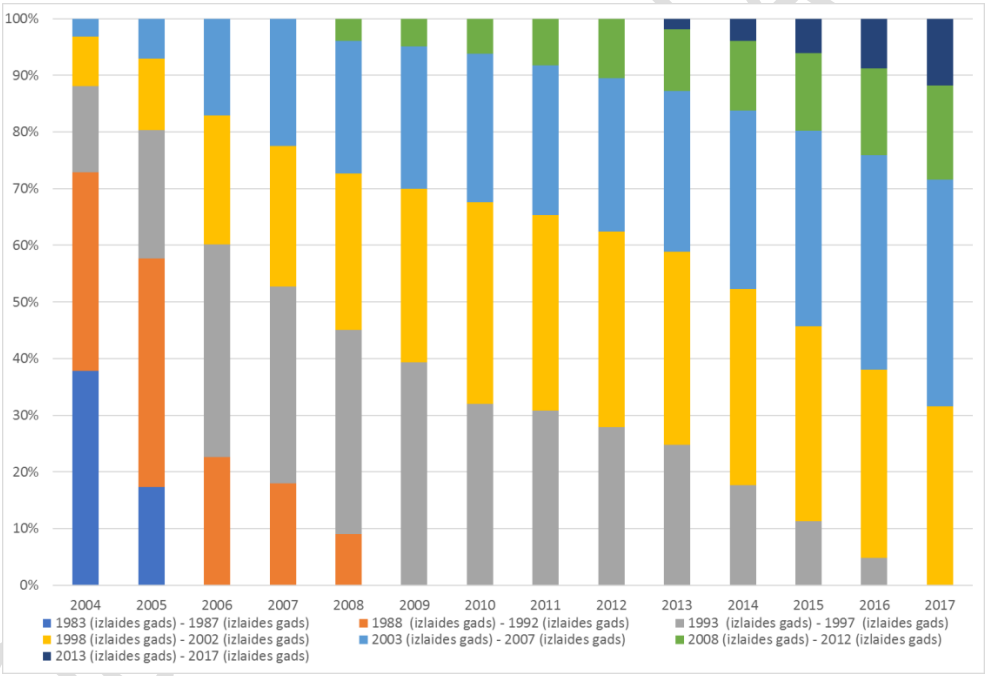


Figure 34. Light vehicles registered in Latvia by year of first registration (%)[190]

According to the survey commissioned by the research centre SKDS "Results of the Public Survey of Latvia — Awareness and Attitude towards Electric Mobility", the most common modes of transport in everyday life are walking (95 %), public transport (82 %), and car (74 %). 32 % of the respondents drive a car every day or almost every day. 9 % drive a car several times a week and 5 % do it once a week or less frequently. 29 % of the respondents indicated that they do not drive a car regularly and 25 % said they do not have a driving licence.

Energy consumption of the State Joint Stock Company Latvijas dzelzceļš (hereinafter — LDz) in 2017 was 108.6 GWh, the majority of which was made up by electricity (37.3 %), diesel (22.6 %), heat (19.8 %), and liquefied gas (10.5 %). LDz uses firewood and wood pellets as RES for heating. The total energy consumption tends to decrease in the last decade — it has decreased

[189] CSB
[190] CSB

by 14 % in comparison with 2011. The consumption of electricity (by 6.95 %), diesel (by 10.92 %), petrol (by 58.40 %), boiler fuel (by 18.63 %), coal (by 72.39 %) and wood chips (by 100 %) is decreasing, but the amount of purchased heating (by 12.81 %) and the consumption of liquefied gas (by 279.32 %), natural gas (by 816.19 %), wood pellets (by 554.79 %), and firewood (by 113.10 %) is increasing. It is planned to invest EUR 441 million[191] in the implementation of the railway electrification project, thus ensuring transition from diesel propulsion to electric propulsion, which will allow to use more energy efficient locomotives and significantly reduce CO_2 emissions (estimated reduction — up to 45,126 t of CO_2 annually).

LDz currently requires research and innovation in areas like secure, clean and efficient energy, smart and clean transport. Measures that can have a direct or indirect impact on energy efficiency and the reduction of CO_2 emissions are implemented according to the medium term investment plan of LDz that includes development projects and restoration programmes. The amount of CO_2 emissions from the use of the public railway infrastructure will depend on the speed and scope of modernising and restoring the locomotive fleet of the country by purchasing more energy efficient electric and diesel locomotives for freight transport (for both transporting and shunting), as well as purchasing electric passenger trains and implementation of the railway electrification project.

4.3.1.4. Current energy intensity of the economy

One of the most common indicators used to evaluate the correlation between economic growth and energy consumption is energy intensity of the economy, which allows to assess how and whether changes in GDP impact changes in the total energy consumption (and vice versa), i.e. whether the economy is developing in a way that the consumption of energy is not increasing significantly and the development of the economy is not based on energy consumption.

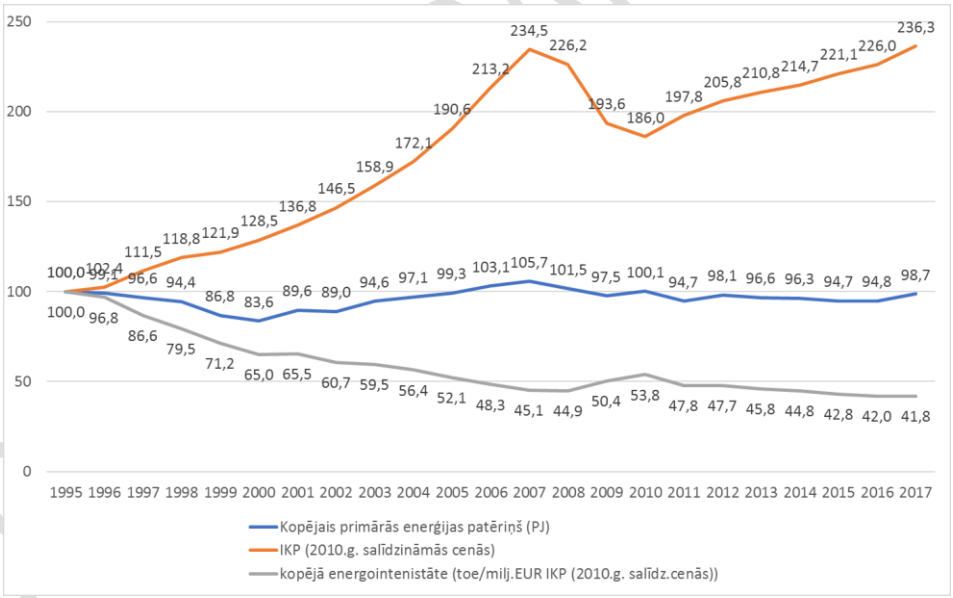


Figure 35. Changes in the total energy consumption, GDP and total energy intensity in Latvia 1995–2017 (1995=100)[192]

The available data suggest that the total primary energy consumption of Latvia reduced by 4.5% in the period from 2005 to 2016 , while GDP of Latvia increased by 18.6% from 2005 to 2016. The overall energy intensity of Latvia also reduced by 19.5 % in the period from 2005 to 2016. Thus it can be concluded that decoupling the total energy consumption and GDP of Latvia is absolute (decoupling has not been observed over several periods) as the energy indicator of

[191] http://elektrifikacija.ldz.lv/
[192] Data source: CSB, EUROSTAT

decoupling — the total energy consumption — has decreased but the GDP has increased significantly.

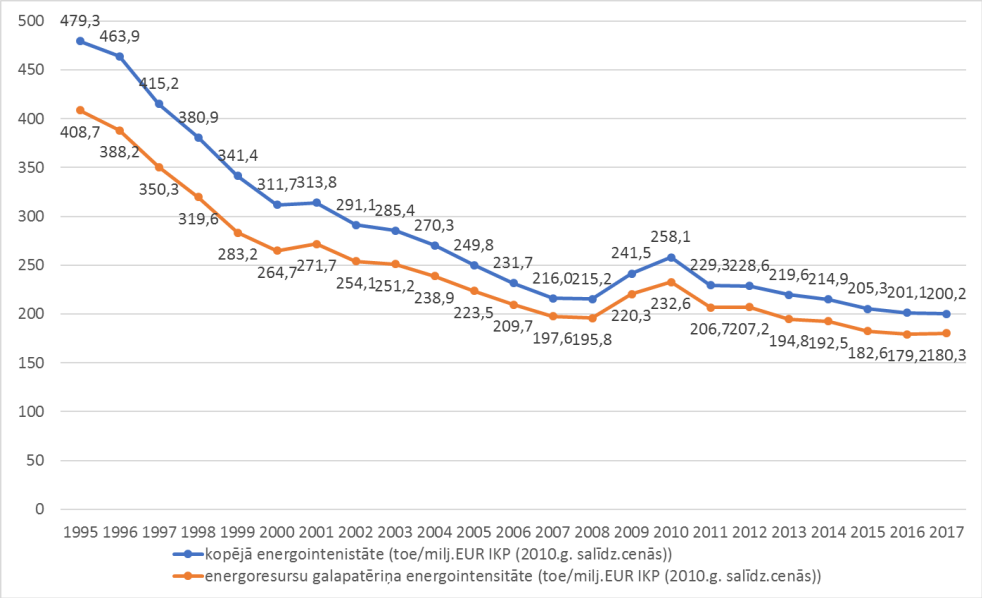


Figure 36. Overall energy intensity and energy intensity of final energy consumption in Latvia 1995–2017 (toe per million EUR GDP (at constant 2010 prices))[193]

4.3.1.5. Progress in fulfilling the 2020 energy efficiency targets of Latvia

The analysis of actual primary energy consumption and final energy consumption trends until 2017 suggests that they are in line with fulfilling the optional target for 2020.

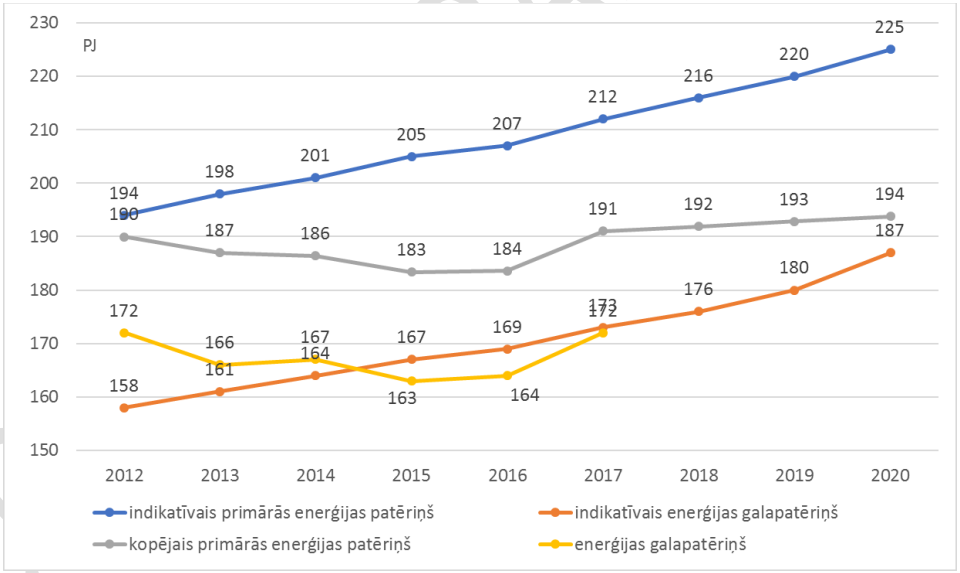


Figure 37. Estimated and actual primary energy consumption and final energy consumption 2012–2020[194]

Energy efficiency measures implemented until 2016 for meeting the mandatory target by 2020 bring cumulative savings of 5,894 GWh, which exceeds the optional target of 3,483 GWh for 2016[195]. The biggest savings of final energy consumption have been achieved with measures in buildings of various final energy consumption sectors by complete or partial renovation. Distribution of the cumulative savings by final energy consumption sector

[193] Data source: CSB, EUROSTAT

[194] IPE study of 2016 "Development of Proposals for the National Energy Efficiency Action Plan in Accordance with the Requirements of Annex XIV Part 2 of Directive 2012/27/EU"

[195] https://ec.europa.eu/energy/sites/ener/files/documents/lv_annual_report_2018_lv.pdf

4.3.1.6. Currently implemented measures within the long-term renovation strategy

The following programmes were implemented during the 2007–2013 programming period for EU funds:

- improving the energy efficiency of the DH system and increasing the share of renewable energy[196];
- RES for the development of combined heat and power plants[197].

The DH energy efficiency programme is implemented in the 2014–2020 programming period for EU funds in two project submission rounds[198].

The programme is implemented with co-financing from the CF in the amount of EUR 60 million, and it is planned to continue the programme also in the 2021–2027 programming period for EU funds as it makes a substantial contribution to improving and modernising the DH system of Latvia and increasing energy efficiency.

In the 2021–2027 programming period for EU funds it is also planned to develop a support programme for creating a district cooling system, which is a substantial part of public buildings. So far there have not been any support programmes for such investments.

It is planned that in the 2021–2027 programming period for EU funds the support for creating and improving DH and cooling systems would be covered by co-financing from the CF.

Support programmes co-financed by the EU funds that are currently being implemented within the framework of the 2014–2020 programming period for EU funds:

- Increasing the energy performance of buildings owned by the state[199].

The Operational Programme "Growth and Employment" with the specific support objective 4.2.1 "To promote the increase of energy efficiency in public and residential buildings" and measure 4.2.1.2 "To promote the increase of energy efficiency in public buildings" is designed to comply with the requirement of Article 5(1) of Directive 2012/27/EU that 3 % of the total floor area of heated and/or cooled buildings owned and occupied by the central government shall be renovated each year to meet at least the minimum energy performance requirements.

- Increasing the energy performance of multi-apartment buildings[200].

Both programmes are supported by co-financing from the ERDF with financing from the ERDF in the amount of EUR 247.9 million, including EUR 150 million for the energy performance of multi-apartment buildings for renovating about 1,030 buildings (ERDF co-financing — 50 % of the eligible costs of the project, average renovation costs — EUR 150-170 thousand) and

[196] All the information related to the programme is available on the Web page of LIAA: http://www.liaa.gov.lv/lv/es-fondi/aktivitates-kuru-ieviesana-noslegusies (Measures for improving the efficiency of district heating systems (Stage 1–6);

[197] All the information related to the programme is available on the Web page of LIAA: http://www.liaa.gov.lv/lv/es-fondi/aktivitates-kuru-ieviesana-noslegusies/atjaunojamo-energoresursu-izmantojosu-kogeneracijas-elektrostciju-attistiba

[198] All the information related to the programme, including the initial assessment of the DH system with indicators reached within the programmes implemented before and the funding attracted, as well as Cabinet Regulations governing the programmes and criteria for assessing project submissions:
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitati_un_vietejo_aer_izmantosanu_centralizetaja_siltumapgade/
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitati_un_vietejo_aer_izmantosanu_centralizetaja_siltumapgade__ii_karta_

[199] All the information related to the project, including the initial assessment, Cabinet Regulations governing the programme, and criteria for assessing project submissions, is available on the Web page of the MoE:
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitates_paaugstinasanu_valsts_ekas;
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitates_paaugstinasanu_valsts_ekas__ii_karta_/

[200] All the information related to the project, including the ex-ante assessment that is harmonised with the EC, Cabinet Regulations governing the programme, and criteria for assessing project submissions, is available on the Web page of the MoE:
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_energoefektivitates_paaugstinasanu_dzivojamas_ekas/

EUR 97.9 million for the energy performance of buildings owned by the state for renovating about 100–120 buildings.

The indicative contribution of both programmes in meeting the energy efficiency targets for Latvia for 2020 is approximately 7–8 % of the total savings required.

- Increasing the energy performance of industrial buildings, including improvement of energy performance of buildings and their engineering systems and increasing energy efficiency of production equipment or replacement with more efficient equipment[201].

The support is provided within the specific support objective 4.1.1 "To promote efficient use of energy sources, reduction of energy consumption, and transition to renewable energy in the manufacturing industry", and this is the only support programme that provides grants to economic operators for implementing energy efficiency measures. The programme is implemented with co-financing from the CF in the amount of EUR 25 million.

The programme provides contribution to reaching national energy efficiency targets and is one of the tools for economic operators to successfully comply with the requirement of the Energy Efficiency Law to perform an energy audit or introduce an energy management system in the company and to implement at least three measures for improving energy efficiency. In the framework of the support programme, a company is eligible for support in the form of a grant for implementing the respective energy efficiency measures.

- Facilitate the increase of energy efficiency and use of RES in municipal buildings in accordance with the integrated development programmes of local governments[202].

With the aim of reducing primary energy consumption of municipal buildings by promoting the increase of energy efficiency and reduction of local government spending on heating and by investing in municipal buildings according to the priorities established in local government development programmes, projects of the specific support objective 4.2.2 "To facilitate the increase of energy efficiency and use of RES in municipal buildings in accordance with the integrated development programmes of local governments" of the Operational Programme are implemented in the 2014–2020 programming period. With the help of co-financing from the European Regional Development Fund in the amount of EUR 46,996,394 it is planned to implement the following measures in public (municipal) buildings by 31 December 2023:

- to reduce the annual primary energy consumption by at least 20,536,239 kWh;
- to reduce the estimated annual GHG emissions by about 5,180 t CO_2 eq.;
- to achieve additional RE capacity of at least 1.8 MW.

4.3.2. Current potential

Latvia has carried out a comprehensive assessment of the potential for the application of high-efficiency cogeneration and efficient district heating and cooling and a cost-benefit analysis pursuant to Article 14 of Directive 2012/27/EU[203]. The assessment led to the following results:

1) The overall share of cogeneration in DH in Latvia is high — 72.6 %. Moreover, some of the regional DH systems in Latvia have almost reached the maximum share of cogeneration in heat production and a high share of renewable energy in the overall fuel structure in 2017 (e.g.

[201] All the information related to the project, including the initial assessment that is harmonised with the EC, Cabinet Regulations governing the programme and criteria for assessing project submissions, is available on the Web page of the Ministry of Economics:
https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_efektivu_energoresursu_izmantosanu__energijas_paterina_samazinasanu_un_pareju_uz_aer_apstrades_rupniecibas_nozare/
https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/veicinat_efektivu_energoresursu_izmantosanu__energijas_paterina_samazinasanu_un_pareju_uz_aer_apstrades_rupniecibas_nozare__ii_karta_/

[202] https://www.cfla.gov.lv/CFLA2/item.php?itemID=40

[203] https://www.em.gov.lv/lv/nozares_politika/energoefektivitate_un_siltumapgade/zinojumi_eiropas_komisijai/

Jelgava with 97 % output in cogeneration mode and 85 % of the fuel in the form of renewable energy). As a result of the analysis of the potential it was concluded that there is no potential for increasing the share of RES at national level, while it was identified and analysed that in certain cities (Daugavpils, Liepāja, and Jūrmala) there could be a potential for introducing high-efficiency cogeneration in district heating but a more in-depth financial analysis is required in each specific case. Calculations are based on the market prices of electricity and heat.

2) Compared to individual heating solutions, DH has the highest energy efficiency level due to higher share of efficient cogeneration. At the same time, DH requires significant investments in infrastructure and involves high operating and maintenance costs. Energy losses in the network also reduce the efficiency of DH. These conditions make DH economically viable only in territories with comparatively high density of heat demand.

Heating density in the territories analysed mostly shows sufficient heat demand for the expansion of the existing DH to be viable for the economy in general. The biggest potential for centralised heating is in the household sector. However, DH demand from households and industries is limited, as the majority prefer individual heating solutions for economic reasons.

3) In order to realise the centralisation potential in DH, it is necessary to create economic incentives to final consumers so that the heating costs in DH do not exceed the costs for alternative individual heating solutions. Such incentives include measures to achieve the reduction of heating tariffs in the DH system, including the need to attract EU funds for investments in establishing new regional DH networks and renovating the existing (old) networks in municipalities where the existing or planned intensity of the heating network exceeds 2 MWh/m. Optimisation of operation and maintenance processes of DH operators and review of the related costs is also necessary.

4.3.3. Indicative development projections

4.3.3.1. Primary energy consumption projections

The optimal solution (minimum total costs of the system) for final energy consumption in the baseline scenario is established based on the estimated final energy consumption under the existing measures and policies for the balance of primary sources until 2050.

The estimated primary energy consumption (including energy imports) in 2030 is about 3 % lower than in 2015. The main reason for this reduction is decreased final energy consumption in households, services, commercial sector, and transport. The biggest reduction is expected in electricity imports and consumption of natural gas and petroleum products with 31.8 %, 17.1 % and 12.6 % respectively, which is related to ensuring reduced energy imports and supply of locally produced energy and reduction of fuel consumption in energy production and transport, while the biggest increase is expected for solid fossil fuels and non-biomass renewable energy with 52.8 % and 46.1 % respectively, which is related to higher output in the manufacturing industry (especially cement manufacturing) and wider use of non-biomass RE technologies in Latvia.

Significant changes in the structure of primary energy types are not expected in the baseline scenario. The share of natural gas and petroleum products in the total primary energy consumption will reduce by about 3 percentage points each, while the share of solid biomass will increase by about 3 percentage points and the share of other types of renewable energy (sun, wind, water) will increase by 2 percentage points.

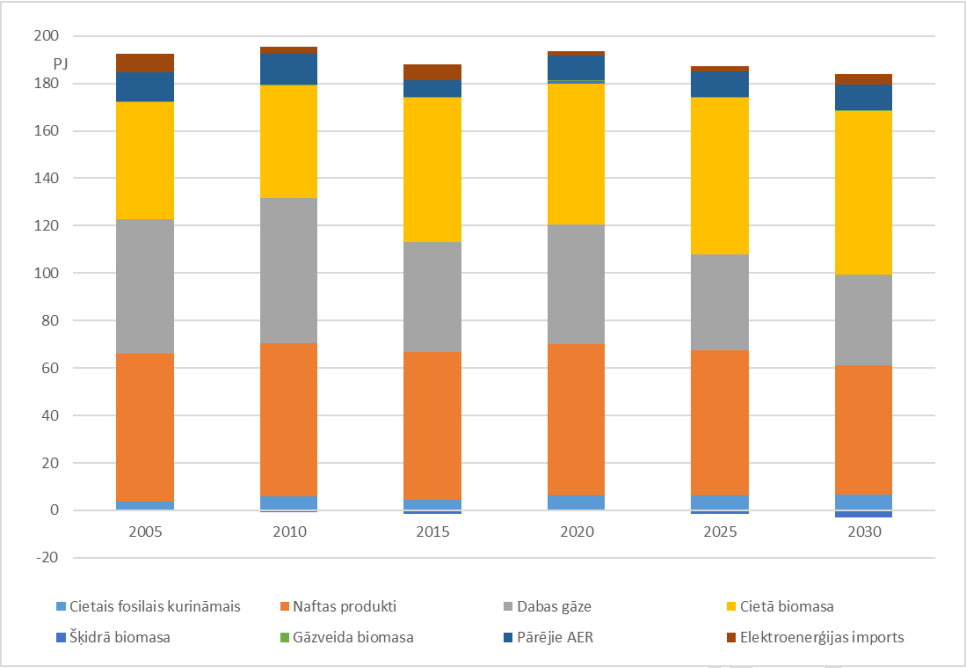


Figure 38. Primary energy consumption until 2030[204] (PJ)

4.3.3.2. Final energy consumption projections

Final energy consumption until 2050 has been estimated by using the macroeconomic projections and the MARKAL-Latvia model with the method for calculating energy consumption.

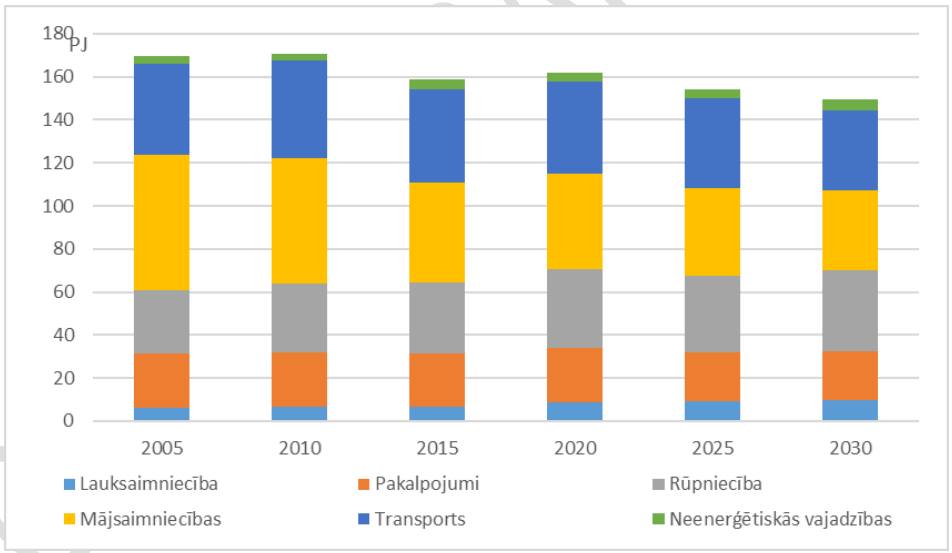


Figure 39. Final energy consumption projections in the baseline scenario until 2030[205] (PJ)

According to the final energy consumption projections, the main energy consumption sectors in 2030 will be transport and industry with 25.3 % and 25.5 % of the total final energy consumption respectively. Households will consume 24 % and services will consume 15.6 %, while the rest will be consumed by the agricultural sector and non-energy needs.

Considering the existing policies and measures implemented in the baseline scenario (scenario with the existing measures), the total final energy consumption in Latvia will reduce by about 6.1 % from 2015 to 2030. The most significant increase in energy consumption by 2030 in comparison with 2016 is expected in industry (3.6 PJ), which is based on the assumptions about

[204] IPE
[205] IPE

the annual growth of added value over the entire period. At the same time, reduction of the final energy consumption is expected in other sectors except agriculture. This trend is based on the assumptions about implementing the energy efficiency policy and projections about population decrease by 2030 and 2050.

It should be noted that the share of electricity in the total final energy consumption will increase by about 3 percentage points by 2030 according to the baseline scenario. At the same time, considering the increase of energy efficiency of cars and wider use of electric vehicles, the share of energy consumption in transport will decrease. The total final electricity consumption will increase by about 11 % by 2030 in comparison with 2016, mainly due to increased electricity consumption in industry and transport. According to the projections, electricity consumption will continue to increase in the period from 2030 to 2050. This trend is based on wider use of electricity not only in transport but also in other sectors, including heating in certain cases.

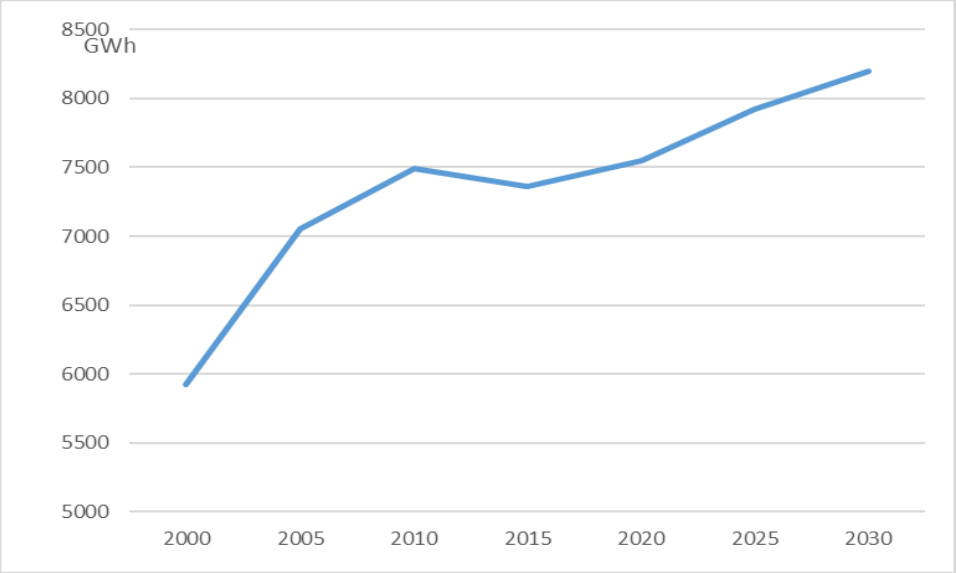


Figure 40. Total electricity consumption projections in the baseline scenario until 2050 (GWh)[206]

The estimated final energy consumption (including district heating and electricity consumption) broken down by energy sources is about 4.9 % lower in 2030 than in 2015 when the biggest reduction was observed in the consumption of hard biomass and petroleum products with 18.9 % and 13.7 % respectively and the biggest increase was observed in the consumption of gaseous biomass, hard fossil fuels and natural gas with 152.8 %, 44.2 % and 19.5 % respectively.

[206] IPE

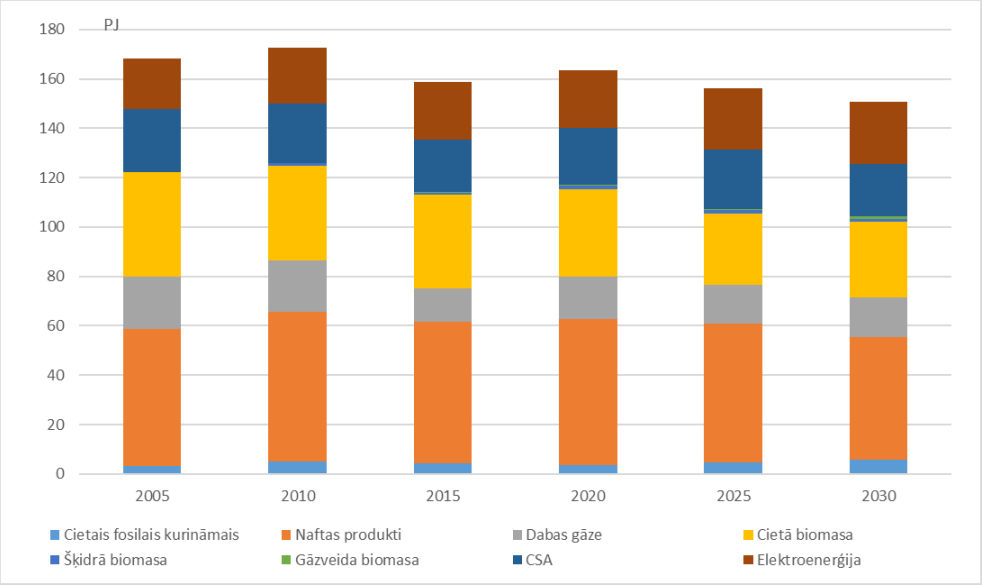


Figure 41. Final energy consumption projections in the baseline scenario until 2030[207] (PJ)

The baseline scenario predicts moderate annual growth of economy after 2023, which means that the companies will not be able to provide sufficient investments in modernisation and equipment replacement to promote rapid increase of energy efficiency. Thus the baseline scenario provides for steady improvement of energy efficiency until 2030. The average increase of energy efficiency in the period from 2020 to 2030 will be slightly higher than in the period from 2000 to 2015.

The largest contribution in energy savings is provided by households (50 % of the total savings) and services (28 % of the total savings) and the rest comes from industry and transport. It should be noted that the implementation of these energy efficiency measures in the baseline scenario requires implementing a policy that removes or reduces obstacles to consumers for implementing energy efficiency measures more actively. While measures in households and services will mainly be based on the reduction of energy consumption in heating (renovation of buildings), measures in transport provide for more rapid replacement of the existing vehicle fleet with more efficient vehicles, including electric vehicles. For example, increasing the excise duty on fossil fuels could be one of the policies to promote more rapid introduction of such vehicles.

The assessment of the energy efficiency potential in sectors and by energy types suggests that households could save up to 20 % of the current consumption by realising the available energy efficiency potential in electricity consumption. The services sector could save up to 16 % of the current electricity consumption. Additional energy saving potential in these sectors can also be realised by implementing building renovation measures.

If industrial sectors continue to implement energy efficiency measures more actively, it will be possible to save up to 25 % of the current electricity consumption and up to 30 % of fuel. It should be noted that the assessments in these and other sectors show the theoretical energy efficiency potential instead of the economic potential. Therefore it is necessary to implement a policy that is focused on improving energy efficiency in order to implement energy efficiency measures to their full extent.

4.3.4. Cost-effective minimum level of requirements

To be updated in the final version of the Plan

[207] IPE

4.4. Energy security

4.4.1. Current situation

Energy security is best described by how much energy Latvia can produce itself (within the country) and how much energy needs to be imported, as well as the number of sources the energy is imported from.

Table 13. The amount of electricity produced in Latvia 2016–2017 (MWh)[208]

Electricity production in Latvia	2016 (MWh)	2017 (MWh)	Difference (2016–2017)
HPPs	2,436,885	4,246,004	74%
Thermal power stations	2,276,264	1,499,672	-34%
WPPs connected to transmission	52,269	54,023	0.03%
Renewable and supported energy producers with the total installed capacity of up to 10 MW	1,465,838	1,546,637	6%
Total amount of energy produced	6,231,257	7,346,336	18%

Latvia has significantly decreased its energy dependency[209] in the period from 1990 to 2016 to 46.9 % (26.1 % reduction in the period from 2005 to 2016) with 47.2 % of the primary energy consumption in Latvia from imported energy in 2016. Energy dependency in Latvia is currently lower than in the EU on average and has decreased despite the increase of the total primary energy consumption in the recent years. Energy dependency improved due to the significant increase of RE and opening of the electricity and gas market, thus decreasing energy dependency on Russia.

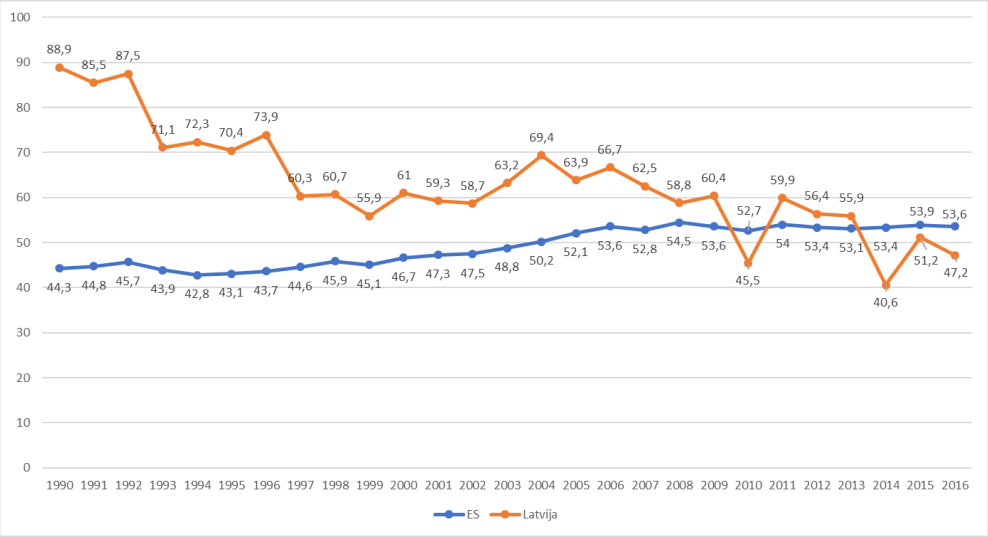


Figure 42. Energy imports in Latvia and EU 1990–2016 (%)[210]

In 2016, Latvia's energy dependency was 84.4 % for solid fossil fuels, 109.1 % for petroleum products, and 83.4 % for natural gas, which is explained by the fact that none of these types of fuel is extracted in Latvia. Moreover, Latvia does not use all of the gas imported and part of the gas is stored in Inčukalns Underground Gas Storage Facility. In addition, Latvia also does not use all of the amount of imported liquid petroleum products and exports some of it.

[208] Source: AS Augstsprieguma tīkls

[209] Energy dependency shows how much a country is dependent on energy imports to meet its energy needs. Energy dependency is an indicator that is calculated by subtracting energy exports from imports and dividing the result by the total energy consumption. This indicator can be calculated for any energy product.

[210] EUROSTAT

In 2016, Latvia produced 85.3 % of the electricity required in Latvia. Electricity imports to the Baltic States from third countries is only possible via the Nord Pool Lithuanian-Belarusian import area (LBI). The amount of electricity imported from third countries in 2017 was 416,301 MWh, which was 64 % less in comparison with 2016 when its was 1,146,711 MWh.

Table 14. Electricity imports and exports of Latvia 2016–2017 (MWh)[211]

	2016 (MWh)	2017 (MWh)	Difference (2016–2017)
Electricity imported in the Latvian transmission network	4,828,354	4,072,912	-16%
Electricity exported from the Latvian transmission network	3,794,883	4,137,077	9%
Electricity balance of Latvia	1,033,471 (deficit)	64,166 (surplus)	106% (surplus)

4.4.2. Development projections

It is expected that Latvia will meet the targets regarding energy security and energy dependency manly due to electricity synchronisation measures, the implementation of which has already started — on 28 June 2018, the Baltic States signed a joint document with Poland and the EC about the synchronisation of the Baltic States' electricity networks with the continental European network, which provides for a commitment to working on synchronising the energy networks of Latvia, Estonia, and Lithuania with the continental Europe, therefore this measure can be regarded as the current policy measure. The main benefits — closer integration in the European market, more intensive competition, and decreasing the historically high dependency of the Baltic States on Russia. The need to implement the project is confirmed by the actual trade — the majority of electricity imported in the Baltic States in 2018 came from the Scandinavian countries.

Latvia is actively working together with other Baltic States to create the regional natural gas market and the transmission system operators of the Baltic States and Finland signed a memorandum of understanding on 12 October 2018 about important issues to be addressed before integrating the natural gas markets of Latvia, Estonia, and Finland. The memorandum of understanding provides for an opportunity for other countries to join the initiative, thus expanding the area of the integrated market.

It is expected that the regional natural gas market could start operating as planned — in 2020. This process will involve establishing a connection between the natural gas systems of Finland and Estonia that will allow Finland to join the regional market of the Baltic States, whereas the transmission connection between Lithuania and Poland will provide access to other natural gas markets in Europe and significantly decrease the dependency of the region on the leading supplier. It is expected that the first steps in Latvia in integrating the natural gas markets of the Baltic States and Finland will be taken in 2020 when the Balticconnector pipeline will connect the natural gas markets of Estonia and Finland.

With regard to the energy security target, Latvia is already implementing it with the current measures and technologies as there is an underground natural gas storage facility in Latvia with the total capacity of 24,219GWh.

Inčukalns Underground Gas Storage Facility is the only functioning storage facility in the Baltic States and ensures the stability of regional gas supply. Natural gas is pumped into the storage facility in the summer season when the consumption of natural gas is significantly lower than in

[211] Source: AS Augstsprieguma tīkls

the cold season, in order to supply it to the consumers in Latvia, Estonia, Northwest Russia, and Lithuania in the heating season.

The functioning of the natural gas system in case of a failure of one object in the system is assessed and prepared according to the methodology described in Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010, which takes into account the N-1 principle or the operational failure in the single largest natural gas infrastructure. N-1 is a theoretical calculation that describes the ability of the technical capacity of the gas infrastructure to satisfy total gas demand in the calculated area in the event of disruption of the single largest gas infrastructure during a day of exceptionally high gas demand occurring with a statistical probability of once in 20 years. N-1 allows to assess the level of protection of natural gas consumers or the security of the natural gas infrastructure in a given territory as a percentage by taking into consideration various parameters of the natural gas system.

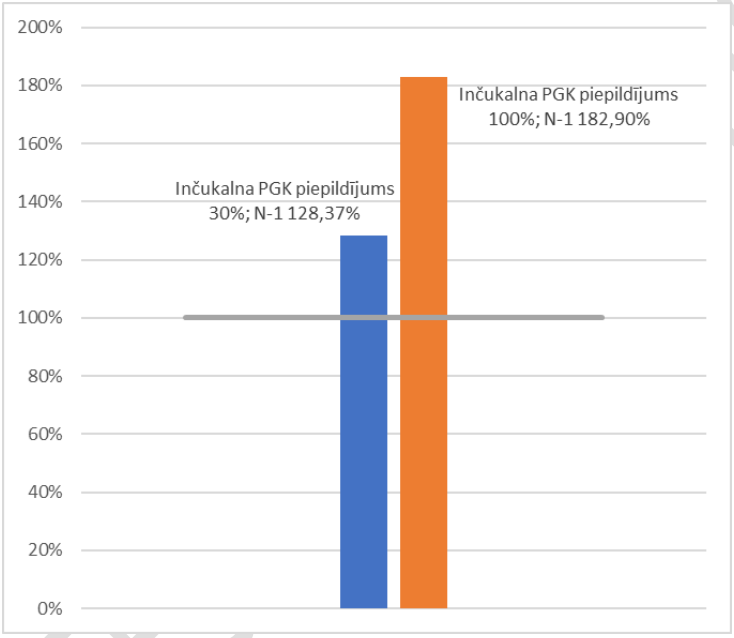


Figure 43. Result of the N-1 calculation[212] depending on the actual capacity of Inčukalns UGSF in 2017[213]

Therefore it can be concluded that the current situation in Latvia corresponds to the requirements and targets regarding energy security.

4.5. Internal energy market

4.5.1. Electricity interconnectivity

4.5.1.1. Current interconnection level and main interconnectors

Depending on production outputs and repair works to be done in the neighbouring countries, the current capacity of the interconnection between Latvia and Estonia is up to 900 MW, the capacity of Latvia-Lithuania interconnection is up to 1,300 MW, and the capacity of Latvia-Russia interconnection is about 300 MW.

The transfer capability in various modes of transmission networks in the Baltic States is currently reduced between Latvia and Estonia due to restrictions in cross-border and internal 330 kV transmission lines introduced by AS Elering (Estonian TSO). The situation improved in

[212] According to Regulation 2017/1938, N – 1 ≥ 100 %
[213] Source: JSC Conexus Baltic Grid (http://www.conexus.lv/uploads/filedir/parvades_operatora_zinojums_2018.pdf)

2013 with the introduction of the second power unit of Rīga CHPP-2 with the installed capacity of 450 MW, but it mainly works only in the cogeneration mode during the winter season (heating season) when there is heating demand in Rīga, while at other times the power plant is not competitive in the electricity market. The load of the Latvian transmission network increased after commissioning the second DC interconnection between Estonia and Finland, Estlink 2, in 2013 as traders in Latvia and Lithuania (for the most part) increased electricity supply from the Nordic countries. After commissioning the Nordbalt interconnection between Sweden and Lithuania in December 2015, the situation between Estonia and Latvia in standard modes has improved as the load has decreased by about 54 %, while in emergency and repair modes it is still limited (information from the report of the transmission system operator of AS Augstsprieguma tīkls in 2016).

The average daily load of the Estonia-Latvia interconnection was 54 % in 2017, which was 13 percentage points less than in 2016.

The average daily load of the Estonia-Latvia interconnection was 47 % in July 2018, which was 22 percentage points less than in June 2018; the load of the Estonia-Latvia interconnection in peak hours was 75 %, but at the time when there was enough local production and less demand for electricity imports from Estonia the load of the interconnection in certain hours reduced to as low as 18 % of the available net transfer capacity. Net transfer capacity was 535,794 MWh.

The latest interconnections — 700 MW NordBalt submarine power cable between Lithuania and Sweden and 500 MW transmission line LitPol between Lithuania and Poland — increase the total interconnection capacity of the energy system of the Baltic States with the European electricity market from 1,000 MW to 2,200 MW.

The natural gas transmission system of Latvia is connected to the natural gas systems of three neighbouring countries: Estonia, Russia, and Lithuania. The connection with Estonia technically allows to ensure natural gas flows from Latvia to Estonia, while connections with Lithuania and Russia allow such flows in both directions. In August 2018, the technical capacity of the transmission connection with Russia towards Latvia reached 178,500 MWh a day, but the estimated capacity for the flow from Latvia to Russia in the heating season is 105,000 MWh a day. The technical capacity of the interconnection with Estonia towards Estonia reached 73,080 MWh a day, while the technical capacity of the interconnection with Lithuania towards Latvia and Lithuania was 67,600 MWh and 65,100 MWh respectively. The overall annual load of all natural gas interconnections is low and does not even reach 50 % of the available capacity; however, some of the natural gas transmission system modes can use up to 100 % of the available capacity, while the main source of natural gas in the heating season for meeting the consumption needs in Latvia considering the consumption growth in the entire region and the related decrease of supplies via pipelines and the limited availability of gas carriers is Inčukalns Underground Gas Storage Facility.

4.5.1.2. Projections of interconnection expansion requirements

According to the EC, the electricity interconnectivity level of Latvia in 2017 is 23.7 %.

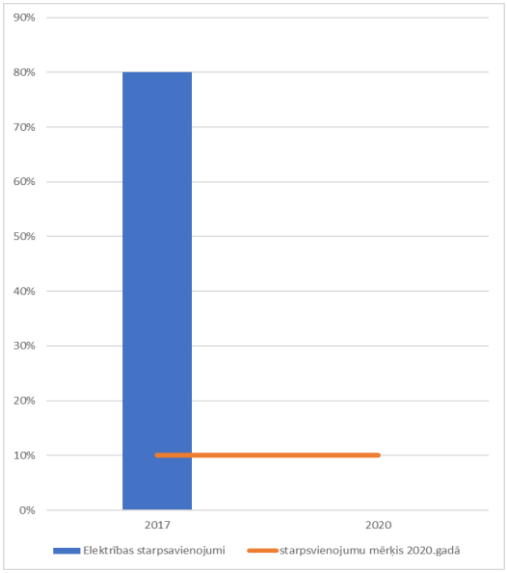


Figure 44. Electricity interconnectivity level of Latvia in 2017

The total installed electricity production capacity of Latvia in 2017 was 2,940.1 MW and the maximum capacity of the interconnections Latvia-Estonia, Latvia-Lithuania, and Latvia-Russia was 2,500 MW.

Table 15. Established interconnections, their average load in 2017 and changes in 2016–2017

Interconnections	Average annual load[214] %	Changes in comparison with 2016 (percentage points)
LV → LT	40%	2
EE → LV	54%	-13
LBI → LT	15%	-12
LT → LV	2%	0
PL → LT	20%	-12
LT → PL	48%	9
SE → LT	63%	-9
FI → EE	18%	-19

4.5.2. Energy transmission infrastructure

4.5.2.1. Key characteristics of the existing transmission infrastructure for electricity and gas

The electricity transmission network currently consists of 330 kV lines in the length of 1,346.43 km and 110 kV lines in the length of 3,893.54 km, 25 330 kV transformers, and 248 110 kV transformers with the total installed capacity of 9,020.5 MVA.

The natural gas transmission and storage operator AS Conexus Baltic Grid manages a distribution pipeline system in the length of 1,188 km covering regions of Latvia and supplying natural gas to the local distribution system with 40 gas distribution points. Inčukalns Underground Gas Storage Facility allows to store up to 2.3 billion m^3 or 24.22 TWh of natural gas.

[214] Transfer capacity = total monthly commercial flow kWh / total monthly net transfer capacity kWh (NTC).

4.5.2.2. Projections of network expansion requirements

AS Sadales tīkls, a company that is obliged to ensure electricity distribution as the distribution system operator in Latvia and renovate, maintain and operate the distribution infrastructure required for providing electricity, covered 99 % of its clients with its services in 2017.

AS Sadales tīkls has set three main operational objectives in the period until 2020:

- development of the smart grid based on digital technologies;
- improving the operational efficiency of the company;
- improving quality and security of power supply.

4.5.3. Electricity and gas markets, energy prices

4.5.3.1. Current situation of electricity and gas markets, including energy prices

The comparison of electricity prices in the markets of Nord Pool bidding areas leads to a conclusion that one of the sharpest drops in prices in 2017 was also in Latvia with 3.91 % to EUR 34.68/MWh. The price reduction in Latvia was mainly related to the first full year of operation of Nord Balt (after the testing period). It significantly reduced the amount of unplanned outages and maintenance, which in turn allowed the electricity prices in Latvia to move closer to those in the Nordic countries.

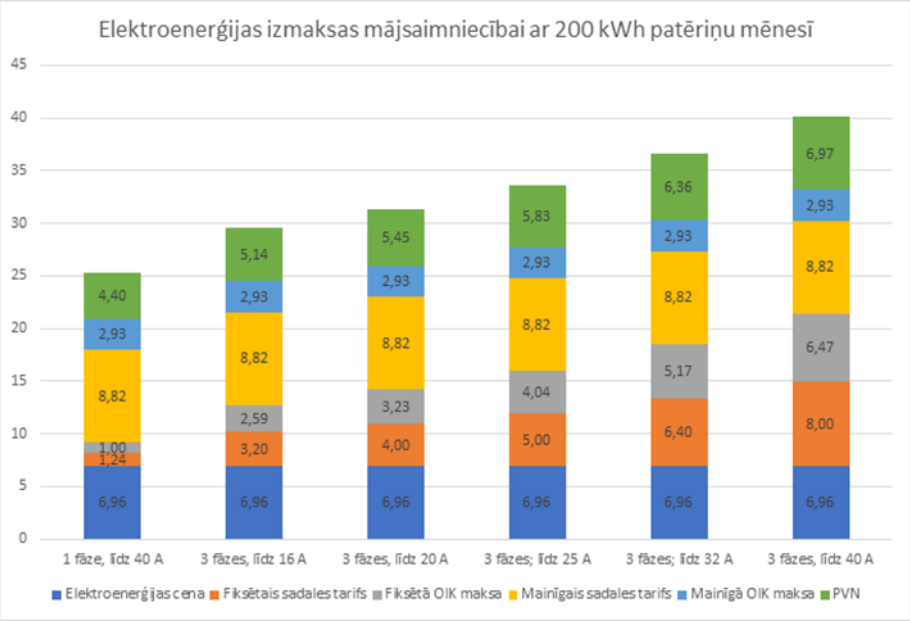


Figure 45. Electricity costs for a household consuming 200 kWh a month[215]

Since restoration of independence of Latvia the natural gas market of the country has shrunk significantly — more than twice — and the market volume in 2017 was about the same as in 2000 — about 1.3 billion m^3. In comparison, the total market volume of the Baltic States and Finland is about 6–6.5 billion m^3. The reduction of the Latvian natural gas market has several objective and positive reasons — reduced losses in energy supply, especially heating, as well as successful use of local resources, e.g. in heating. It also benefits the security of Latvia as the dependency on energy imports decreases. The potential benefit of a regional market for Latvia is its geographic location, which creates opportunities for natural gas transit from south to north, as well as the technical capacity of Inčukalns Underground Gas Storage Facility when used as a market instrument.

[215] The calculation is based on the average Nord Pool electricity price — EUR 0.0348/kWh

The average price households in Latvia paid for natural gas in the period from 2013 to 2017 was EUR 0.0456/kWh, which is slightly more than in Estonia but less than in Lithuania and EU overall with the average sales price in the respective period of EUR 0.0659/kWh. According to EUROSTAT216, sales prices of natural gas increased significantly in several EU Member States from the second half of 2016 to the second half of 2017. Estonia experienced the largest increase of sales prices in Europe of 26 %.

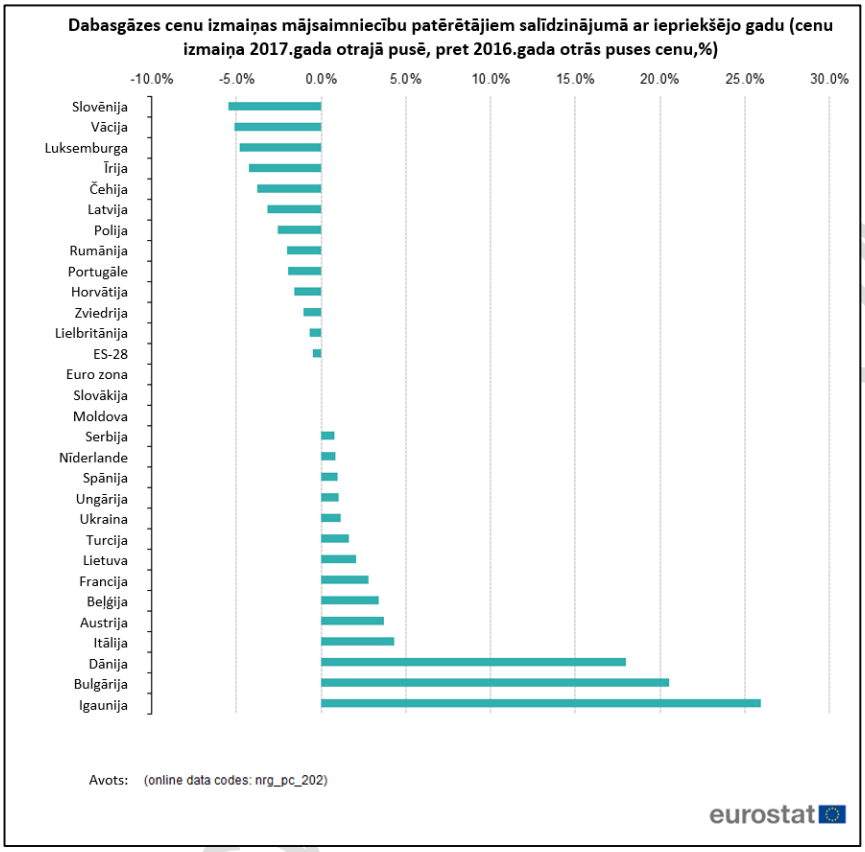
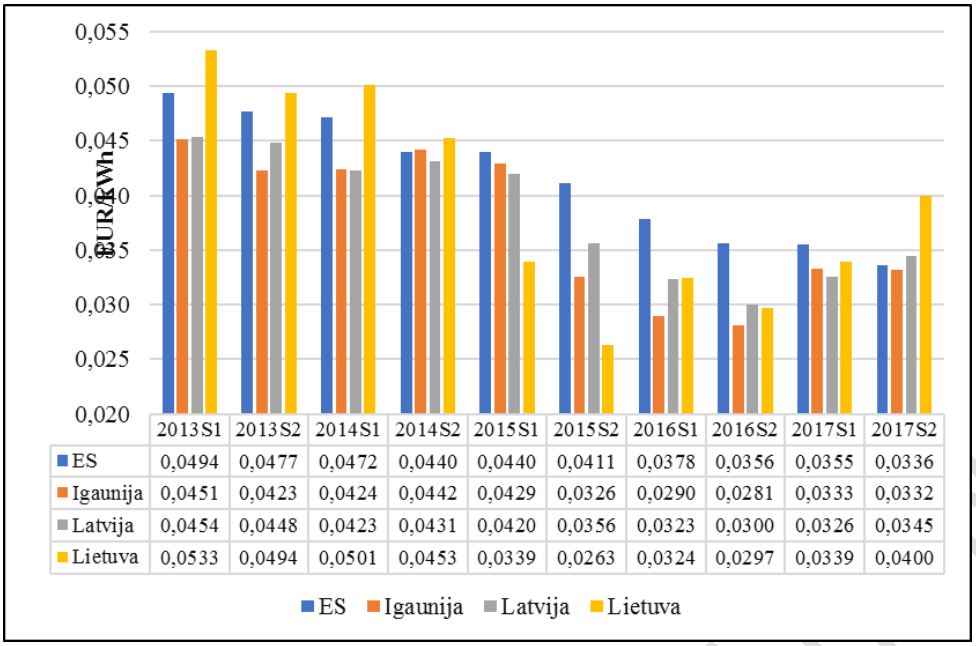


Figure 46. Comparison of changes in the price of natural gas for household consumers in the second half of 2017 and the second half of 2016[217]

As stated previously, the price of natural gas and other energy sources depend on various factors related to supply and demand, the price of oil, climate conditions, e.g. in case of cold winters the demand for natural gas increases, natural gas storage facilities in Europe are emptied, and the price of natural gas increases.

[216] Eurostat Statistics Explained: Natural gas price statistics, retrieved in November 2017 http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_price_statistics

[217] Natural gas price statistics http://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_price_statistics#Natural_gas_prices_for_household_consumers



	2013S1	2013S2	2014S1	2014S2	2015S1	2015S2	2016S1	2016S2	2017S1	2017S2
ES	0,0494	0,0477	0,0472	0,0440	0,0440	0,0411	0,0378	0,0356	0,0355	0,0336
Igaunija	0,0451	0,0423	0,0424	0,0442	0,0429	0,0326	0,0290	0,0281	0,0333	0,0332
Latvija	0,0454	0,0448	0,0423	0,0431	0,0420	0,0356	0,0323	0,0300	0,0326	0,0345
Lietuva	0,0533	0,0494	0,0501	0,0453	0,0339	0,0263	0,0324	0,0297	0,0339	0,0400

Figure 47. Changes in the price of natural gas for non-household consumers, EUR per kWh (bi-annual)[218]

Wholesale prices of natural gas apply to the system users that consume more than 25,000 m^3 of natural gas a year. Natural gas prices for large non-household consumers in Latvia are generally lower than the EU average. The average price the large consumers in Latvia paid for natural gas in the period from 2013 to 2017 was EUR 0.0456/kWh, which is slightly more than in Estonia (EUR 0.0433/kWh) but less than in Lithuania (EUR 0.0469/kWh) and EU overall with the average wholesale price in the period from 2013 to 2017 of EUR 0.0659/kWh.

At the end of 2014 the price of natural gas had declined significantly due to the low storage demand after the moderate winter and the low demand in Asia. The average price of natural gas continued to decrease in 2015 despite growing imports[219].

One of the positive market indicators in the development of the natural gas market of Latvia in the first half of 2018 was the wholesale price of natural gas, but it was certainly influenced by the overall decline of natural gas prices in Europe in the first half of 2017. According to the statistical data of the EC[220], Latvia concluded 2017 with one of the lowest wholesale prices in the EU — EUR 17.11 per megawatt hour in the fourth quarter of 2017, which was the lowest price in the Baltic Sea Region and even lower than in one of the most active natural gas markets of Europe, Germany, which was a positive signal to our consumers (the price of natural gas in Germany corresponds to the hub price of trading platforms). It is important to note that the statistics compiled by the EC about the wholesale price of natural gas, which is calculated based on the data provided by customs authorities, does not always correspond to the actual natural gas price for specific consumers; however, since the EC statistics is collected by the EU Member States according to a common methodology, the statistics should mainly be regarded as an instrument that allows to compare the differences of the wholesale prices of natural gas between EU Member States.

[218] Gas prices for non-household consumers — bi-annual data (from 2007 onwards) (nrg_pc_203), Latvia, Lithuania, Estonia, EU http://ec.europa.eu/eurostat/data/database
Source: Eurostat; Ministry of Economics

[219] Quarterly Report on European Gas Markets, Market Observatory for Energy, DG Energy Volume 9,issue 1; fourth quarter of 2015 and first quarter of 2016
https://ec.europa.eu/energy/en/data-analysis/market-analysis

[220] Quarterly Report on European Gas Markets, Market Observatory for Energy, DG Energy Volume 10,issue 4; fourth quarter of 2017
https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_q4_2017_final_20180323.pdf

According to the information in the quarterly reports[12] on gas markets, the fourth quarter of 2017 (September, October, November, December) concluded with a reduction of natural gas consumption in the entire Europe with the most significant decrease of gas consumption in comparison with the same period in 2016 registered in Denmark (-7 %), Sweden (-17 %), Finland (-16 %), as well as Latvia (-13 %). The sharp reduction is related to the comparatively high air temperature in winter in Northern Europe. Overall, however, the consumption of natural gas in the Baltic States and Northern Europe in 2017 was lower than in 2014, but it is related to the weather conditions.

The figure below shows different average sales prices of natural gas in the winning tenders and price ranges, excluding tariffs for system services. The prices are divided into three consumption groups — up to 1,000, 2,500, and 55,000 MWh.

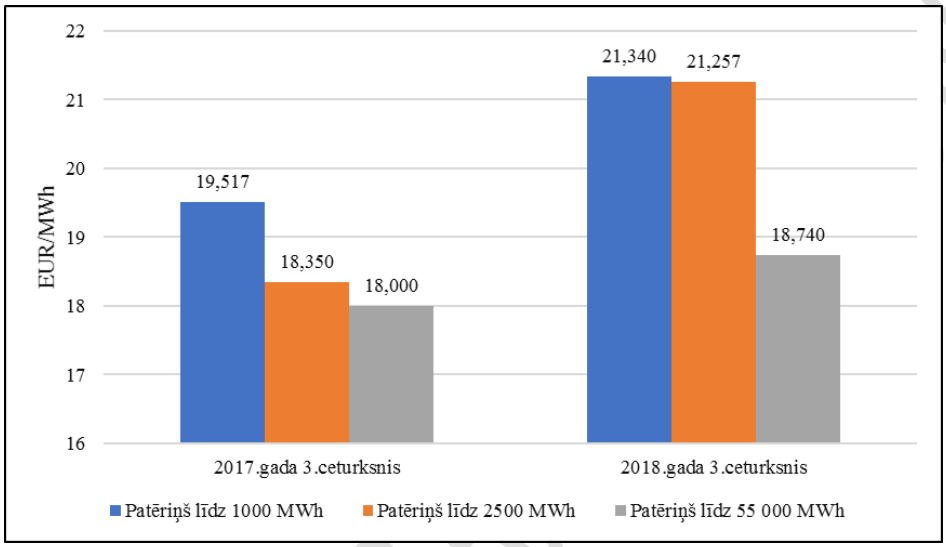


Figure 48. Indicative average sales prices of natural gas and price ranges in procurements for legal persons[221]

The calculations are based on the public information of randomly selected actual contracts with natural gas consumers about the price per unit of natural gas that does not include costs about the transmission and distribution of natural gas and does not reflect other conditions of the contracts that can influence the economic feasibility of such contracts. The prices in Figure 6 are indicative and show the winning price of randomly selected procurements in 2017 and 2018 over the same period, third quarter of the year, to allow to compare transactions that have actually taken place. These prices are provided for information purposes only and the actual market prices of natural gas differ by consumer depending on the contract. The prices shown in Figure 6 are fixed for the duration of the contract, while in the case of contracts where the price of natural gas is linked to market indices or based on other possible conditions the prices might have changed in the given period.

4.5.3.2. Development projections

Since the electricity consumed in Latvia is purchased from the Nord Pool wholesale market, the electricity market of the Baltic States and Nordic countries is highly developed. A large share of electricity is produced from water and wind sources in the Nordic countries. Due to the drought in 2018, the availability of water resources was limited both in Latvia and Nordic countries, which had an impact on the electricity production in hydroelectric power plants and made it more difficult to cool nuclear reactors in Nordic countries. Prolonged heat also reduces wind speed, thus reducing energy production in wind power plants. The hot weather also increased the use of cooling and conditioning equipment in both private sector and industry, thus increasing the total electricity consumption in the European countries. Due to the drought and

[221] Procurements https://www.iub.gov.lv/lv/iubsearch/q/dabasg%C4%81ze/
Source: Ministry of Economics; Bureau of Procurement Supervision

low wind speeds it was not possible to produce enough electricity from water and wind power only, therefore fossil fuel plants were used more to produce electricity. The electricity price in Latvia has risen significantly within a year along with the overall global increase of energy prices (oil, natural gas, coal) and the increase of the CO_2 allowance price. Since last August the prices have increased by 88 % in the Nordic countries, by 52 % in Estonia, and by 58 % in Latvia. The market price of electricity might remain at the same level in 2019. However, it will depend on the weather conditions in both the Scandinavian countries and Latvia — the amount of snow in winter and rain in the next spring to provide hydroelectric power plants with water resources.

The average sales price of natural gas in 2017 was EUR 2.60/MWh higher than in 2016. It is projected that the price of natural gas will continue to increase. Although natural gas did become cheaper in Latvia and Europe in the period from 2014 to 2016, the price has been increasing again since 2017. The price of natural gas on the German market area Gaspool in August 2018 was EUR 5.20/MWh higher than in January 2017, while on the Dutch trading point Title Transfer Facility (TTF) the price increased by EUR 4.73/MWh. It is projected that the prices on Gaspool and TTF will continue to increase. It means that natural gas might become more expensive in Latvia as well. The price of natural gas in the future will depend on many interrelated factors, including fluctuations of natural gas prices on exchanges and geopolitical developments around the world. At the same time it should be noted that the price of natural gas in Latvia before opening the market was considerably higher than on Gaspool and TTF.

4.5.4. Energy poverty and energy availability

The expenses of households about dwelling, water, electricity, gas and other types of fuel in 2016 amounted to about 15.3 % of the total housing expenses, which was about 27.5 % more than in 2005.

EUROSTAT data show that heating in dwellings due to lack of money was not available to 14.5 % of the inhabitants of Latvia in 2015. This figured decreased to 10.6 % in 2016 and 9.7 % in 2017[222]. This problem affects about 9.4 % of people in Europe on average. The calculation of the Institute of Private Finances at Swedbank published last year shows that the costs of heating and electricity amount to about 8 % of the total income of the inhabitants of Latvia.

This figure can be calculated not only as a share in the total population but also as a share in the number of people at risk of poverty considering the target. Out of the people at risk of poverty, 22.7 % could not afford heating due to lack of money in 2016[223], which is twice as more compared to the share in the total population. Moreover, the situation is different if certain types of households are analysed — some types of households differ considerably from the EU-28 figure.

Table 16. Households that could not afford heating due to lack of money *(%)*[224]

Type of household	2016	2017
One-person household (of the total population)		
Latvia	20.1	16.8
EU-28	10.9	10.7
One-person household (at risk of poverty, hereinafter — AROP)		
Latvia	27.8	23.8
EU-28	19.3	19.7

[222] EUROSTAT
[223] EUROSTAT
[224] The table includes types of households differing from the EU-28 average by more than 4 percentage points.

One-person household over the age of 65 (AROP)		
Latvia	34.5	27.8
EU-28	20.6	20.3
One-person household over the age of 65 (of the total population)		
Latvia	22.6	19.6
EU-28	10.5	10.7
One-person household (women) (of the total population)		
Latvia	22.4	19.2
EU-28	11.9	11.7
One-person household (women) (AROP)		
Latvia	28.7	25.1
EU-28	20.0	20.5
Two adults, one 65+ (of the total population)		
Latvia	10.2	12.5
EU-28	6.6	7.1
Two adults with two dependent children (AROP)		
Latvia	15.8	23.5
EU-28	17.6	16.8
Two adults with three dependent children (AROP)		
Latvia	28.4	26.8
EU-28	21.7	18.4

The support in addressing housing issues shows the number of recipients of the housing allowance, the average amount of the housing allowance, and the resources spent for this purpose. The housing allowance was granted to 93.7 thousand inhabitants (4.8 % of the total population) in 2017. The average amount of the housing allowance for one person is EUR 177 and the municipalities spent EUR 16.5 million on housing allowances last year.

4.6. Research, innovation and competitiveness

4.6.1. Current situation in the technology sector

To be updated in the final version of the Plan

4.6.2. Current situation in innovation and boosting competitiveness

The following measures are being implemented in the 2014–2020 period of EU funds and Norwegian Financial Mechanism to support innovative economic operators:

4.6.2.1. Measures of the EEA/Norwegian Financial Mechanism

Planning of the new period of the EEA/Norwegian Financial Mechanism started in 2017. On 14 December 2017, Latvia and Norway signed a Memorandum of Understanding to provide

EUR 12.5 million for innovative, environmentally friendly business activities within the programme "Business Development, Innovation and SMEs" with the total funding of EUR 14.7 million along with the national contribution. It is planned to develop the concept of the programme and Cabinet Regulation by the end of 2018.

4.6.2.2. Development of start-up companies in Latvia

The aim is to promote the development of innovative businesses and research in the private sector, as well as research commercialisation. The Law On Aid for the Activities of Start-up Companies has been in force since 1 January 2017. The law refers to start-up companies — commercial companies with a high growth potential the basic activity of which is related to the development, production, or improvement of scalable business models and innovative products. The law provides for an aid programme for the fixed payment by applying the personal income tax and enterprise income tax relief and an aid programme for attracting highly qualified employees by applying the enterprise income tax relief. In order to extend the scope of the law by increasing the number of beneficiaries and adapting the law to the standard industry practice, the Saeima approved amendments to the law in the final reading on 12 April 2018. Start-up companies can also benefit from the risk capital funding — EUR 15 million from acceleration funds and EUR 60 million from seed and growth risk capital funds. Start up-companies were granted the opportunity to attract funding for attracting highly qualified employees within the programme "Support for the Improvement of Technology Transfer System" in 2017 with the maximum aid intensity of 45 %. On 31 August 2018, amendments to Cabinet Regulation entered into force to extend the coverage of beneficiaries to small and medium enterprises that can attract funding for attracting highly qualified employees who contribute to the development of new products or technologies.

4.6.2.3. Support for the development of new products and technologies within competence centres[225]

Three selection rounds for projects with the aim of increasing competitiveness of economic operators by promoting cooperation between research and industry and implementing projects that develop new products and technologies and introduce them into production. The total eligible funding for the first, second, and fourth round of the measure is EUR 80.14 million, including ERDF funding in the amount of EUR 64.3 million and private co-financing in the amount of EUR 15.83 million.

4.6.2.4. Support for the improvement of technology transfer system[226]

The total eligible funding for this measure is EUR 42.35 million, including ERDF funding in the amount of EUR 34.5 million, national contribution in the amount of EUR 6.088 million, and private co-financing in the amount of EUR 1.76 million.

4.6.2.5. Support for introducing new products into production[227]

The aim of the measure is to promote the increase of productivity and competitiveness of economic operators by developing new products and technologies and introducing them into production, as well as by increasing private sector investments in research, development and innovation according to the Smart Specialisation Strategy. The support within the measure is intended for producing and testing full scale production equipment prototypes in an actual production environment in RIS3 sectors. The support is provided for developing production equipment and introducing it into production until technology readiness level 8 (TRL8), the

[225] https://www.cfla.gov.lv/lv/es-fondi-2014-2020/projektu-istenosana/1-2-1-1-atbalsts-jaunu-produktu-un-tehnologiju-izstradei-kompetences-centru-ietvaros-1-karta
http://www.cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/1-2-1-1-atbalsts-jaunu-produktu-un-tehnologiju-izstradei-kompetences-centru-ietvaros-2-karta
https://cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/1-2-1-1-k-4

[226] http://cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/1-2-1-2

[227] https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/jaunu_produktu_ieviesanas_razosana/

equipment is experimental and has not been previously used in the production environment. A prototype of the equipment has to be developed during the implementation of the project. In the follow-up stage of the project the equipment is used in production.

The total eligible funding available for implementing the project is EUR 70.6 million, including ERDF funding in the amount of EUR 60 million and private funding of at least EUR 10.6 million.

4.6.2.6. Support for employee training[228]

The aim of the measure is to provide economic operators with appropriately qualified employees to increase productivity and promote the development of new or improved products and technologies and introduce them into production. The total available ERDF funding for the measure is EUR 18 million.

4.6.2.7. Innovation motivation programme[229]

The aim of the measure is to inform and encourage the society (including by awarding prizes) to start innovative entrepreneurship, inform the society about the developments in the field of innovation and its potential, thus stimulating the society and entrepreneurs to develop and use innovative solutions, as well as increase the share of innovative economic operators in the economy and promote business in the specialisation priorities or sectors defined in the Smart Specialisation Strategy of Latvia. The total eligible funding of the measure is EUR 5.65 million, including ERDF funding in the amount of EUR 4.8 million and national contribution in the amount of EUR 847,000.

4.6.2.8. Support for ICT and non-technology learning, as well as learning aimed at attracting investors[230]

The aim of the measure is to support the productivity and efficiency of self-employed persons and micro, small, medium-sized and large enterprises by improving the qualification and skills of their employees in information and communication technologies, and to provide economic operators with appropriately qualified employees by promoting the introduction of non-technological innovations by economic operators, as well as to provide support for learning by facilitating the attraction of investors to the country. The public funding available for the measure is EUR 6.91 million.

4.6.2.9. Support for investments in construction or reconstruction of production facilities and infrastructure[231]

The aim of the measure is to promote the expansion of manufacturing businesses and establishment of new businesses by supporting the construction of industrial facilities in regions. The estimated available ERDF funding for the measure is EUR 50.6 million. The available ERDF funding, taking into account the performance reserve, is EUR 49 million, which is distributed equally between five planning regions (i.e. EUR 9.8 million for each planning region).

[228] http://www.cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/1-2-2-1-atbalsts-nodarbinato-apmacibam
[229] http://cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/1-2-2-2-inovaciju-motivacijas-programma
[230] http://www.cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/1-2-2-3-atbalsts-ikt-un-netehnologiskam-apmacibam-ka-ari-apmacibam-lai-sekmetu-investoru-piesaisti
[231] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/Mazo%20un%20vid%C4%93jo%20komersantu%20konkur%C4%93tsp%C4%93jas%20veicin%C4%81%C5%A1ana/

4.6.2.10. Regional business incubators and Creative Industries Incubator[232]

The aim of the measure is to support the establishment of new viable and competitive economic operators in the regions of Latvia by providing final beneficiaries with the necessary advice, training, measures regarding general business matters, mentor support, environment (working space), and grant arrangements for covering the operational costs of economic operators. The support within the measure is provided in the form of pre-incubation support and incubation support.

The total funding available for regional business incubators is EUR 25.76 million, which includes ERDF funding in the amount of EUR 21.9 million and national contribution in the amount of EUR 3.87 million. The total funding available for the Creative Industries Incubator is EUR 7.06 million, which includes ERDF funding in the amount of EUR 6 million and national contribution in the amount of EUR 1.06 million.

4.6.2.11. Promotion of international competitiveness[233]

The aim of the measure is to promote the international competitiveness of sectors by supporting entrepreneurship and entering into foreign markets, ensuring the operation of Foreign Economic Representative Offices, and developing the international competitiveness of Latvia as a tourist destination in priority tourism sectors (business and event tourism, wellness tourism).

The total eligible funding for this measure is EUR 60.6 million, including ERDF funding in the amount of EUR 51.53 million, national contribution in the amount of EUR 3.74 million, and co-financing from the private sector, municipalities, and planning regions in the amount of EUR 5.35 million.

4.6.2.12. Cluster programme[234]

The aim of the measure is to facilitate cooperation of economic operators and research, educational, municipal, and other institutions at the national and international level, thus promoting the competitiveness of economic operators, increasing exports and the share of high added value products and services in exports, as well as innovation and new products. The idea of the measure is that a project proposer establishes a cluster that brings together businesses, research organisations, scientific institutions, educational institutions, and other organisations in a single network and operates in interconnected sectors, a market niche, a group of products or services, a value chain, or a region. The funding available for the measure is EUR 6.2 million.

4.6.2.13. Acceleration funds[235]

The aim of the measure is to promote the development and competitiveness of performers of economic activity by providing acceleration (i.e. promotion, stimulation, development, acceleration) services and funding for business projects that involve technological or industrial risks. The funding available for implementing the measure is EUR 15 million, including ERDF funding in the amount of EUR 13 million.

4.6.2.14. Seed capital and start-up capital funds[236]

Seed and start-up capital funds will provide seed capital investments in the amount of up to EUR 250,000 and start-up capital investments in the amount of up to EUR 2 million. Investments will be made to finance the establishment and development of performers of economic activity and will be provided in the form of quasi-equity or equity capital. The funding

[232] http://cfla.gov.lv/lv/es-fondi-2014-2020/projektu-istenosana/3-1-1-6-regionalie-biznesa-inkubatori-un-radoso-industriju-inkubators
[233] http://www.cfla.gov.lv/lv/es-fondi-2014-2020/izsludinatas-atlases/3-2-1-2
[234] https://em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/klasteru_programma/
[235] https://www.altum.lv/lv/pakalpojumi/biznesa-uzsacejiem/akseleracijas-fondi/par-programmu/
[236] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/seklas_un_sakuma_kapitala_fondi/

is available from two seed capital and start-up capital funds chosen in an open procurement. The funding available for implementing the measure is EUR 30 million.

4.6.2.15. Growth capital funds[237]

Growth capital funds will provide venture capital investments for the development of economic operators and cooperative companies providing agricultural services in the amount of 15 % of the capital. The investments will be made in the form of quasi-equity or equity capital investments. The funding available for implementing the measure is EUR 30 million.

4.6.2.16. Parallel loans[238]

Mezzanine loans or parallel loans are granted to economic operators and cooperative companies providing agricultural services for the development of their business (subordinated long-term investment loans with an increased credit risk). Parallel loans will be granted together with loans from commercial banks. A parallel loan can be granted if it exceeds at least EUR 50,000. The funding available for implementing the measure is EUR 32.98 million.

4.6.2.17. Micro lending and loans for starting business[239]

Support within the measure is provided to economic operators in the form of loans:

- micro loans are granted to micro, small, and medium-sized enterprises for implementing viable business projects — investments and current assets;
- starting loans are granted to new economic operators for implementing viable business projects — investments and current assets.

The funding available for implementing the measure is EUR 31.5 million.

4.6.2.18. Loan guarantees[240]

The measure provides loan guarantees for investment loans, current asset loans, financial leasings, financial leasing limits, factoring, as well as tender, advance payment, performance, and time guarantees. Repayment suspension will be available for existing financial transactions. The loan guarantee will cover up to 80 % of the financial service.

The funding available for implementing the measure is EUR 38.29 million.

4.6.2.19. Export credit guarantees[241]

The measure provides export credit guarantees for transactions in high-risk markets, transactions in Latvia, EU, and industrialised countries. The funding available for implementing the measure is EUR 20 million.

4.6.3. Current situation in research

The first monitoring report of the RIS3 strategy was developed in 2017, and it was concluded that significant work has been done in the improvement of the RIS3 ecosystem from 2014 to 2017. Structural reforms have been implemented — the number of scientific institutes has been reduced from 40 to 22, conditions for granting basic funding for science have been changed so as to fund only internationally competitive scientific institutions and introduce a funding formula that stimulates research quality and attraction of external funding, conditions for introducing

[237] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/izaugsmes_kapitala_fondi/
[238] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/paralelie_aizdevumi/
[239] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/mikrokreditesana_un_aizdevumi_biznesa_uzsacejiem/
[240] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/aizdevumu_garantijas/
[241] https://www.em.gov.lv/lv/es_fondi/atbalsta_pasakumi_2014_2020/mazo_un_videjo_komersantu_konkuretspejas_veicinasana/eksporta_kreditu_garantijas/

investments from EU funds and national contributions into science and innovation have been developed. At the same time it has been concluded that the main indicator of knowledge and technology capacity — investments in R&D — has not increased and the amount of national contributions has not been provided according to the plan.

As of 2017, contracts about basic funding for science with scientific institutions, including universities, include an obligation to generate demand for science and innovation.

4.6.3.1. NRP

NRP is a public procurement for implementing scientific research in a specific area of economy, education, culture, or another priority sector for the country with the aim of promoting the development of the sector. Aims and objectives of the NRP are defined by the respective sectoral ministries after consulting the Latvian Academy of Sciences and the Latvian Council of Science. NRP project tenders are organised and implemented by the Latvian Council of Science.

By the time of the development of the Plan two NRP stages have been implemented within the NRP: 2010–2013 and 2014–2020, while the implementation of NRP 2014–2017 has been extended to the end of 2018. Two NRP blocks of NRP 2014–2020 are related to the conditions of the dimensions included in the Plan:

1) Scientific research directions offered in the NRP on energy 2014–2017 (LATENERGI)[242] "Energy efficient and low carbon solutions for a secure, sustainable and climate variability reducing energy supply" provide for a complex and integrated approach to studying the energy sector of Latvia and the interaction of limiting environmental factors. Timely and quality development of the scientific background provided an opportunity to offer practical and sound solutions for the development of the energy sector of Latvia on the way to meeting the EU priority targets 20/20/20. The programme provided for an interdisciplinary approach to both the defined research directions and implementation of the programme — it involved leading scientific institutions of Latvia in the fields of energy and environmental protection and economic partners (businesses, professional associations), as well as decision-makers. Research topics within the programme were technologically innovative, cost-effective solutions for ensuring sustainable energy production and consumption, increasing energy efficiency, and developing environmentally friendly RES.

Six projects were implemented within the programme:

1. Innovative power electronic technologies for increasing energy efficiency in the economy of Latvia, future power supply grids, and using renewable energy;
2. Optimisation of energy system development planning, energy production, trade, and distribution;
3. Sustainable climate policy and innovative, energy efficient technological solutions (KPIET);
4. Innovative technologies of hydrogen and biofuel production, storage, quality control, quality provision, and use in Latvia;
5. Assessment of the impact of energy and climate policy;
6. Complex research on innovative technologies for producing and using RE and the potential of biogas production in the waste recycling sector.

2) NRP on environment and climate EVIDEnT "The value and dynamic of Latvia's ecosystems under changing climate" (2014–2017)[243] is focused on meeting all 10 objectives of the sub-programme 1.2 "Environment and climate" of the first priority direction "Environment, climate and energy" for the NRP tender for 2014–2017. The programme is structured in five projects.

[242] http://latenergi.rtu.lv/index.html
[243] http://www.vpp-evident.lv/

1. The first project involved adaptation/elaboration of models for wind fields, waves and currents, development of wave and current measurement sensor prototypes, as well as field measurements and studies of the functioning of food chains in a system "lake-river-sea".
2. The second project involved studies of introduced species in the freshwater ecosystem (HPP reservoir), ports and adjacent areas, and the coastal area of the Baltic Sea.
3. The third project involved the development of a modelling tool and integrated development scenarios for economic sectors, inspection of farms, development of farm typology in Latvia in the context of reducing GHG emissions, and selection of measures for reducing GHG emissions of farms in Latvia and the related cost-benefit analysis, assessment of the integrated impact of forestry.
4. The fourth project involved fundamental studies of biodiversity, modelling biotopes, assessment of the value of ecosystem services, as well as recommendations for the development of the economy.
5. The fifth project involved the development of climate scenarios and improvement of the hydrogeological model, including water infiltration measurements.

Implementation of the 2018–2021 period of the NRP has been started during the development of the Plan.

NRP "Energy" is a public procurement for implementing scientific research in the energy sector with the aim of promoting its development. The programme was approved by Cabinet Order of 26 September 2018 No. 462 "On the National Research Programme "Energy""[244]. The programme is designed to contribute to the development of sustainable, modern, and competitive energy in Latvia that is consistent with the public interest, including with regard to a comprehensive plan that outlines the national energy and climate policy for the period until 2030 and measures to be implemented within it. The funding granted for the implementation of the programme in 2018–2020 is EUR 6 million, or EUR 2 million each year.

The programme has the following objectives:

1) to establish the analytical knowledge base that is required for determining strategic objectives of the long-term national energy policy, and to develop policy recommendations for reaching strategic objectives as well as analytical tools and models for assessing the impact of the policy objectives and policy measures according to the substantive and methodological requirements of the legislation of EU and Latvia;

2) to develop the knowledge base required for the development of energy infrastructure and market by including solutions for developing and optimising energy systems, projections of the production and use of various types of energy, production and consumption trends, logistical support and technological solutions for energy supply, as well as solutions for the security of the energy supply system;

3) to develop the knowledge base in the area of energy efficiency by including a comprehensive assessment of the potential of energy efficiency in economic sectors and certain fields, assessment of energy efficiency measures, research of new engineering solutions, assessment of the potential of developing efficient heating and cooling systems in Latvia, as well as development of respective policies and funding solutions;

4) to develop the knowledge base in the use of renewable and local energy sources, the potential of these resources from the territorial and sectoral point of view, their market, sustainability, technical, social, and economic impact, support mechanisms, and transnational cooperation mechanisms, technologies, impact on the overall security of the energy system and the market, as well as to develop appropriate policy and funding solutions;

[244] https://likumi.lv/ta/id/301891-par-valsts-petijumu-programmu-energetika

5) to promote international cooperation of national authorities with scientific institutions in the area of energy research to address long-term energy issues and challenges and develop a sustainable energy policy based on research and efficiency.

Regulations[245] of tenders to be organised within the programme were approved on 4 October 2018, and the deadline for submitting projects is 9 November or 12 November 2018.

4.6.3.2. Scientific basis

Research for the purposes of low carbon technologies is also implemented through other programmes, e.g. National Budget Programme 05.02.00 "Basic Funding for Science", which is an institutional funding calculated on the basis of performance indicators, including the energy sector, and is used also for providing salaries for those work with the scientific infrastructure and researchers in this sector in 21 national scientific institutions. A total of EUR 25 million have been invested in 2018, about one-third of it in institutions that carry out research in the area of smart energy.

4.6.3.3. Competence centres

Measure 1.2.1.1 "Support for the development of new products and technologies within competence centres" is implemented within the specific support objective 1.2.1 "To increase private sector investments in R&D" of the operational programme "Growth and Employment" with the aim of increasing the competitiveness of economic operators by promoting cooperation between research and industry through projects that involve the development of new products and technologies and their introduction into production. The total available amount of support is EUR 80.1 million, EUR 79.1 million of which is available to support research by competence centres (support for experimental development and industrial research) and EUR 1 million is available for a management project.

Implementation of a total of 146 projects had been started in eight competence centres by 31 December 2017. 39 projects were finished by 31 December 2017, and products developed within these projects have already been introduced into production or will be introduced in the near future. Support was provided to 132 companies for introducing new products and technologies.

Within the technology transfer programme, 40 projects for commercialising scientific ideas for the development of the technical and economical feasibility study and commercialisation strategy and 10 applications from economic operators about granting innovation voucher support have been approved by the end of 2017. Ideas of 85 projects that can be commercialised were presented in pitch sessions within the programme.

On 16 September 2016, Contract No. 1.2.1.1/16/A/008 with the Central Finance and Contracting Agency was signed about implementing the project "Competence Centre of Smart Engineering Systems, Transport and Energy" for receiving ERDF co-financing in the amount of EUR 3,206,250 within the measure 1.2.1.1 "Support for the Development of New Products and Technologies within Competence Centres" of the specific support objective 1.2.1 "To increase private sector investments in R&D" of the operational programme "Growth and Employment". In the framework of this Competence Centre, 21 research projects by 21 economic operators are being implemented as at 1 July 2018. The project implementation period is 31 December 2018.

4.6.3.4. Horizon 2020

EC assessment of the Horizon 2020 Policy Support Facility regarding science funding in Latvia was initiated in 2017. The most important recommendations:

- funding for R&D should be increased, especially from the state budget;

[245] https://www.em.gov.lv/lv/nozares_politika/valsts_petijumu_programma__energetika_/

- modernisation of the governance of higher education institutions should be continued (investments for this purpose will be made within the support objective "To Ensure Better Governance in Higher Education Institutions", see also Section 3.4.4);
- investments in innovation should be increased also in the business sector, including public companies (MoES proposes national research programmes of sectoral ministries; national research programme of MoE will be launched in 2018);
- funding for R&D projects available in tenders should be increased by reconciling them with national needs (will be implemented starting from 2018 with new conditions for the funding of fundamental and applied research projects and national research programmes);
- the structure of national authorities should be reconciled with national needs (e.g. by considering a possibility to establish a single point of contact for administering research projects, which is to be evaluated within the Public Administration Reform Plan).

4.6.3.5. LIFE

GHG emission measurements in peatlands of Latvia have been started within the project "Sustainable and responsible management and re-use of degraded peatlands in Latvia" (LIFE Restore) of the LIFE project in order to approbate the methodology of GHG emission inventories and develop national GHG emission factors for managed transition mires and raised bog soils.

In 2017, the Administration of Latvian Environmental Protection Fund (hereinafter — ALEPF) continued to implement the new policy initiative that had been started in the previous years — the principle *Money returns to the nature*. This policy initiative was implemented through tenders and priority nature protection projects of national significance in the sub-programme "Nature Conservation Projects", ensuring implementation of 111 projects for a total amount of EUR 3,668,379.

The project "Capacity Building for the Implementation of LIFE Programme in Latvia" (LIFE14 CAP/LV/000002, CAP LIFE LAT) was initiated on 1 January 2016 and will continue until 31 December 2019. The project is implemented by the Ministry of Environmental Protection and Regional Development (lead partner) and the Administration of Latvian Environmental Protection Fund (cooperation partner). The main goal of the capacity building project is to raise awareness about the LIFE programme and increase the number of projects submitted and supported.

In 2017, LVAFA organised procurements for three studies within the activities of the CAP LIFE LAT project:

- "Assessment of Priorities in Introducing Climate Policy for Attracting EC Funding for LIFE" — the study was carried out in three areas: nature conservation, environmental protection, and climate policy;
- "Innovation Potential in Latvia in the Context of LIFE Sub-programme for Environment and Resource Efficiency";
- "Comparison of the Available Sources of Funding for Introducing Nature, Environmental, and Climate Policy in Latvia".

A population survey was carried out within the capacity building project to find out the opinion of the inhabitants of Latvia about climate change, various environmental issues, and awareness of the LIFE programme.

4.6.3.6. Main problems in the area of R&D in Latvia

- The main building block of the economy of Latvia are micro, small, and medium-sized enterprises that are not capable of investing in R&D, and the number of high technology companies is low.

- Constantly insufficient state budget contributions to science.
- A small number of employees in science, research, technology development and innovation and the small number of young employees in these sectors.
- Financial investments in infrastructure are not in balance with investments in maintaining and developing human resources.
- Insufficient cooperation and coordination between science, technology development and innovation institutions, institutions of higher education, national regulatory authorities, and industry.
- Insufficient international cooperation.
- Insufficiently developed opportunities for commercialising inventions as a result of R&D.

4.6.4. Current expenses

4.6.4.1. Innovation and competitiveness

More than EUR 500 million funding is available for Latvia for the period until 2020 to meet the innovation objectives defined in SDSL2030 to support investments and increase competitiveness of small and medium enterprises.

Figure 49. Funding available to support investments and increase competitiveness of SMEs for the period until 2020

4.6.4.2. Research and development

According to the 2018 European Innovation Scoreboard, Latvia has maintained its position in the 24th place among 28 EU Member States covered by the study compared to the previous year remaining in the group of moderate innovators with contribution to innovation of 50–90 % of the average EU level. However, reaching the target of investments in R&D still remains a major challenge.

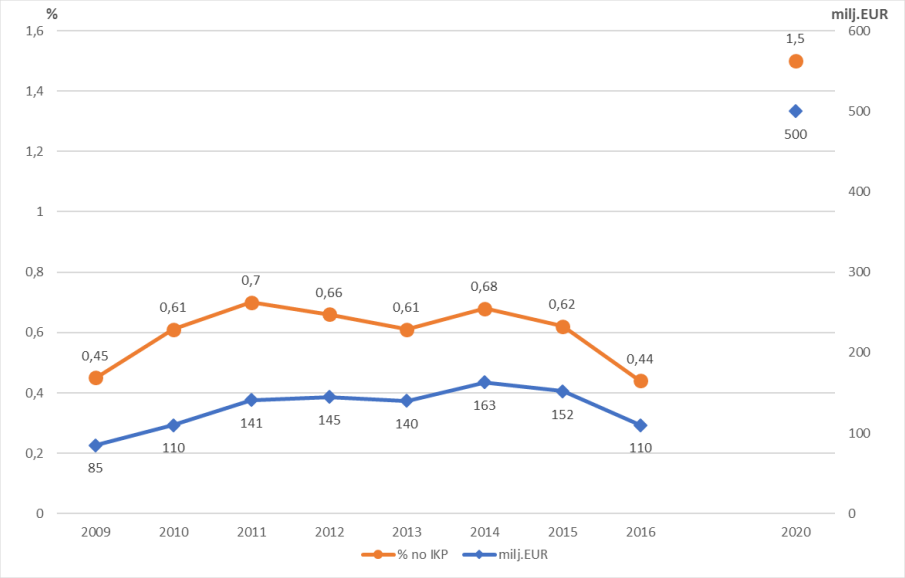


Figure 50. Contribution to the target of investments in R&D until 2016 (total funding for R&D)

Total expenses of Latvia in R&D in 2016 was EUR 110.4 million, which amounted to 0.44 % of GDP. It is significantly less than it was planned in 2016 (1.1 %) and also less than in the previous years on average. The sharpest decrease (by 55 %) was registered in the total foreign R&D funding, manly foreign investments in the business sector. It was largely due to the transition period between two programming periods for EU funds, as science support measures for the 2007–2013 programming period had already been implemented, while the implementation of support measures for science, R&D and innovation of the new programming period (2014–2020) had not been started yet. The structure and dynamics of R&D funding suggests that investments in R&D highly depend on the contribution of EU funds, while corporate investments in R&D remained at a low level over a long period.

The amount of investments in R&D is insufficient and still lags behind the NRP target. For example, in order for the expenses of Latvia in R&D to reach 1.5 % of GDP, the amount of investments in 2020 should be EUR 462.6 million, 50 % of which should be public finding. According to the regulatory framework, the institutional funding for science in Latvia — basic funding for science — is not granted in full amount based on calculations. Only 52 % of the calculated basic funding for science were granted in 2017, which was at least EUR 21.4 million less. Moreover, it should be noted that due to a prolonged gap in R&D funding the number of employees in R&D has decreased significantly — in 2016 it reduced by 8.8 % compared to 2015.

In the period from 2014 to 2018 (data as of 01.08.2018) a total of EUR 32.1 million were invested in the research of low carbon technologies. Estimates of the funding include data about research related to energy production, management of energy systems, and development of new materials and engineering technologies in the energy sector.

Table 17. The amount of funding invested in energy research (2014–2018) and distribution by the source of funding

Funding sources for research, including in the energy sector (2014–2018)	Total funding attracted for energy research, EUR	Total funding available in the respective programme, EUR	Share of funding in energy research of the total funding available, %
Funding from the state budget:	**10,692,024**	**53,551,028**	**19.97%**
Fundamental and applied research programme	*6,442,024*	*23,860,083*	*27.00%*

National research programme	*4,250,000*	*29,690,945*	*14.31%*
Funding from EU structural funds:	**8,423,016**	**54,523,138**	**15.45%**
Measure 1.1.1.1: Applied research	*7,305,736*	*36,770,000*	*19.87%*
Measure 1.1.1.2: Support for post-doctoral research	*1,117,280*	*14,754,731*	*7.57%*
Measure 1.2.1.1: Support for the development of new products and technologies within competence centres	*5,455,840*	*32,062,500*	*17.02%*
EU programme Horizon 2020 with three core themes (data as of 01.06.2018):	**12,565,722**	**6,862,789,245**	**0.18%**
Secure, clean and efficient energy	*7,233,880*	*2,726,528,213*	*0.27%*
Smart, green and integrated transport	*4,566,768*	*2,605,236,981*	*0.18%*
Climate action, environment, resource efficiency and raw materials	*765,074*	*1,531,024,051*	*0.05%*
Private funding:	**439,520**	n/a	n/a
Research based on procurements	*439,520*	*n/a*	*n/a*
Total	**32,120,282**		

Table 18. Projects of Latvia submitted to Horizon 2020 and granted funding by thematic area[246]

Energy efficiency	RE	Energy systems	Smart cities and communities	Fossil fuel	Horizontal actions
EUR 5,6 million	EUR 0,4 million	EUR 0,2 million	EUR 0,0 million	EUR 0,0 million	EUR 0,2 million

4.6.4.3. Patents

A patent is an instrument for gaining maximum benefit from innovation, as it gives exclusive rights of use and ensures a positive return on investment. The number of patent applications is one of the indicators that reflects the innovation capability of a country.

In the period from 2008 to 2017, applicants from Latvia have submitted 488 European patent applications, and 87 have received European patents. The dynamics of European patent applications from 2008 to 2017 shows steady development; however, the figure is significantly lower than the EU average, which leads to considering additional measures for improving the situation.

A similar trend can be observed in the number of international patent applications (PCT) — 205 PCT patent applications were submitted from 2008 to 2015 (an average of 25 patents a year), which is a low figure compared to the EU average, which means that additional incentives are required. By the end of 2018 it is planned to develop measures for including an innovation section in the Action Plan for the Improvement of Business Environment, which will include measures for increasing the number of patent applications in Latvia.

[246] Source: Data from the report by Horizon 2020 Programme Committee for Secure, Clean and Efficient Energy, 2018

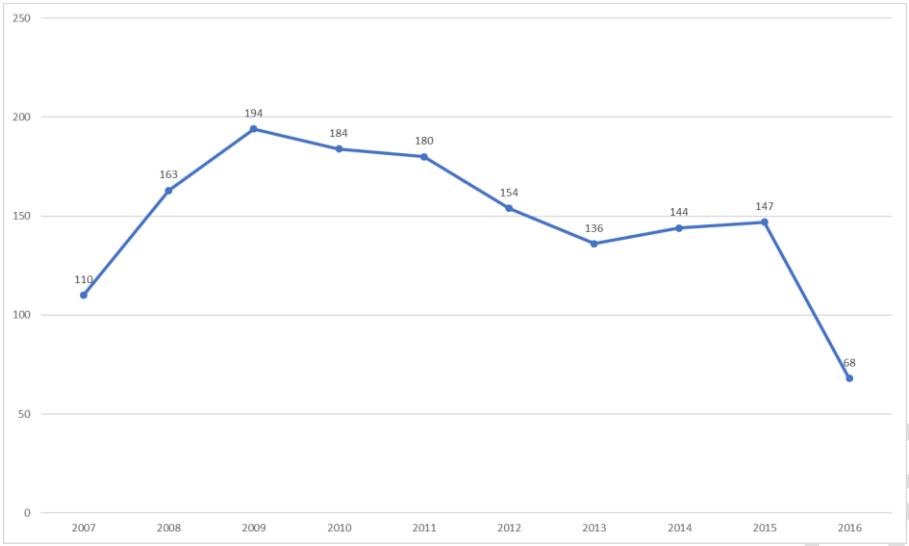


Figure 51. Patents issued by the Patent Office of the Republic of Latvia based on national applications (number)

According to the RIS3 monitoring report, the share of patents issued by the European Patent Office to the residents of Latvia of the total number of patents issued has not changed significantly: 0,02 % of all the patents issued in 2011 and 2016 were issued to the residents of Latvia. In terms of the number of patents issued per 1 million of inhabitants, Latvia issued 8 patents in 2016[247].

In the period from 2015 to 2018[248] **89 patents** regarding smart energy and clean technologies were registered at the Patent Office of the Republic of Latvia (data as of 06.08.2018):

Table 19. Patents registered at the Patent Office of the Republic of Latvia regarding smart energy and clean technologies

	2015	2016	2017	2018	Total
Engineering technologies, lighting, heating	13	14	5	8	40
Electricity	10	9	18	5	42
Mechanics, materials, and other engineering technologies		5	2		7
					89

4.6.4.4. Researchers

The number of scientific employees (scientists, technical and service staff) in Latvia (full-time equivalent, hereinafter — FTE) in 2015 was 5,570, which was 0.58 % of the total number of employees in Latvia. The number of young researchers working at universities between 2014 and 2015 increased from 307 FTE to 397 FTE or by 29 %, which means that the number of these researchers increased in the majority of universities.

NISRA[249], in operation since 2017, summarises the information provided by scientific institutions about researchers working at scientific institutions, research infrastructure, research projects, and results of scientific activities. Since 2017 was the first year the scientific institutions had to provide information on an electronic database, not all institutions have provided the information yet (currently there is mostly data from public scientific institutions);

[247] Informative report "Monitoring of the Smart Specialisation Strategy", approved at the meeting of the Cabinet of Ministers of 27.02.2018
[248] Data according to the Espacenet.com database
[249] https://sciencelatvia.lv/

the information about the number of researchers and funding is indicative and has not been fully examined and verified, thus it can slightly change by the end of the year.

MoES calculates the number of scientific employees by scientific disciplines and subdisciplines. According to the data available on the NISRA Registry of Persons Elected in Academic Positions in Scientific Institutions (06.08.2018), 833 persons have been registered in scientific subdisciplines related to energy and climate. This number is indicative, since not all scientific institutions have indicated whether all the activities of researchers registered in the respective institutions correspond to the specific subdiscipline. MoES does not have any information about the number of researchers employed in research and development by companies and scientific institutions that carry out research but have not been registered in the registry of scientific institutions.

Table 20. Number of researchers registered in Latvia (06.08.2018)

Scientific subdiscipline	Number of researchers registered on the NISRA and elected in academic positions in the respective subdisciplines
Construction and transport engineering	124
Electrical engineering, electronics, information and communication technologies	222
Physics and astronomy	81
Engineering and technology	11
Chemistry	73
Chemical engineering	80
Mechanical engineering and mechanics	52
Material engineering	56
Environmental engineering and energy	97
Earth sciences, physical geography, and environmental sciences	37
	833

4.6.5. Current division of price components

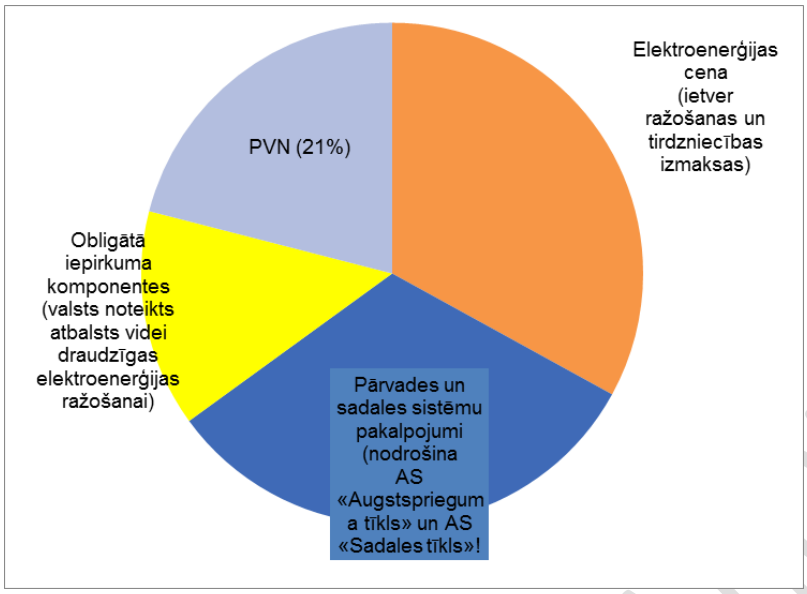


Figure 52. Division of price components for the final electricity consumer[250]

The price of natural gas is regulated by the market, while other services and taxes are regulated by the state.

Figure 53. Components of the total payment[251]

[250] Source: AS Sadales tīkls
[251] Source: AS Latvijas gāze

5. IMPACT ASSESSMENT OF PLANNED POLICIES AND MEASURES

5.1. Impact on the energy system, greenhouse gas emissions and removals

5.1.1. Projections of the development of the energy system, GHG emissions, CO_2 removals, and air pollutants

5.1.1.1. Impact assessment of meeting the targets of GHG emissions and CO_2 removals

The indicative amount of GHG emissions projected in the baseline scenario is significantly lower than the initial projections of GHG emissions submitted to the EC on 30 May 2017. Therefore an additional sensitivity analysis of the projections was carried out in all sectors by taking into consideration the macroeconomic projections described above (previously projected number of inhabitants and GDP growth) or other crucial indicators for certain sectors. However, the sensitivity analysis did not include the analysis of failure to implement or partial implementation of the policies and measures.

If the overall GHG emissions budget is estimated in tonnes, the deficit compared to the calculated indicative total target in the period from 2021 to 2030 will be **219.56 kt of CO_2 eq.**, whereas according to the sensitivity analysis it will be **4,549.14 kt of CO_2 eq.** In case of the forecast submitted on 30 May 2017, the deficit would be **9,554.92 kt of CO_2 eq.**

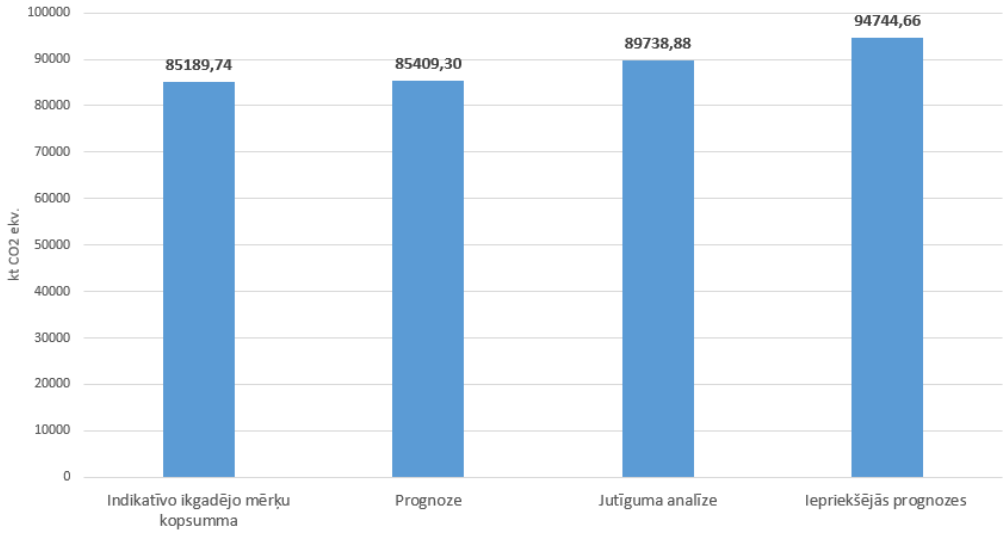


Figure 54. Comparison of GHG emission budgets in the total GHG emissions from the non-ETS sector from 2021 to 2030 (kt of CO_2 eq.)

5.1.1.2. Assessment of meeting the renewable energy contribution

In order to assess the impact of RE on the overall figures of the energy system, alternative scenarios were modelled to establish the target of the share of renewable energy in the total final energy consumption from 2030 to 2050 (42 %; 45 %, 48 %; 50 %, and 55 %).

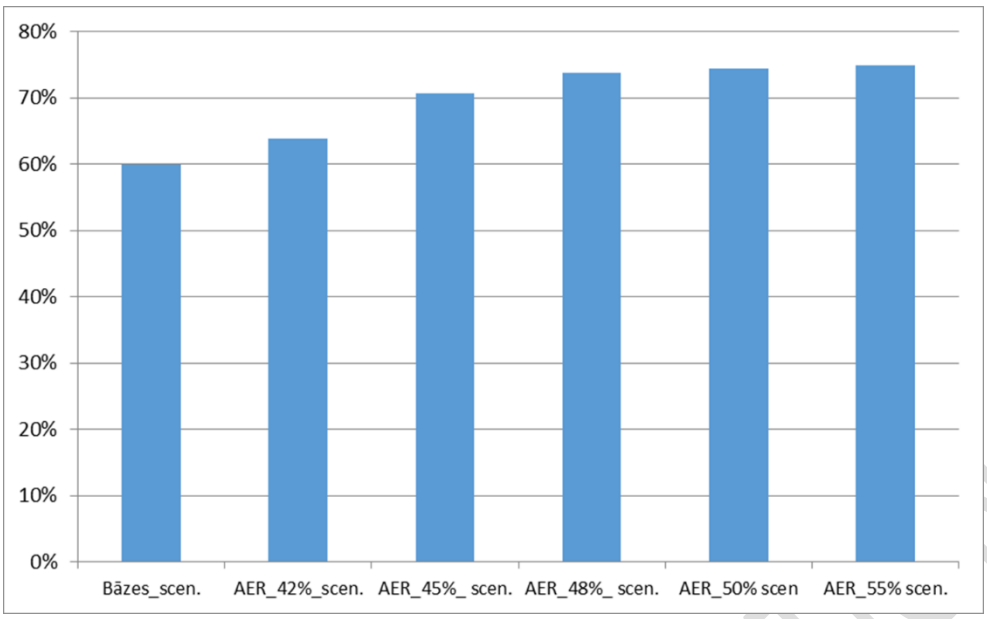


Figure 55. Share of electricity produced from renewable energy in the total electricity consumption in 2030 according to modelled alternative scenarios (%)

Increasing the overall target of renewable energy by 2030 means that the share of electricity produced from renewable energy sources (RES-E) should also be increased. In comparison with the baseline scenario, the increase of this share is more significant in the target scenarios where the share of RES is at least 45 %. According to the modelling results, the share of RES-E in the total electricity consumption in 2030 is about 65 % in the RES_45% scenario, about 67 % in the RES_48% scenario, and almost 70 % in the RES_50% scenario.

Modelling results were also used to calculate the average additional costs for electricity production in RES target scenarios. Additional costs were calculated on the basis of the baseline scenario and applied to a 10-year period. As it can be seen in the figure below, in the RES_48% scenario where production of electricity from RES increases by 7 percentage points compared to the baseline scenario, additional costs are about EUR 0.09 per kWh.

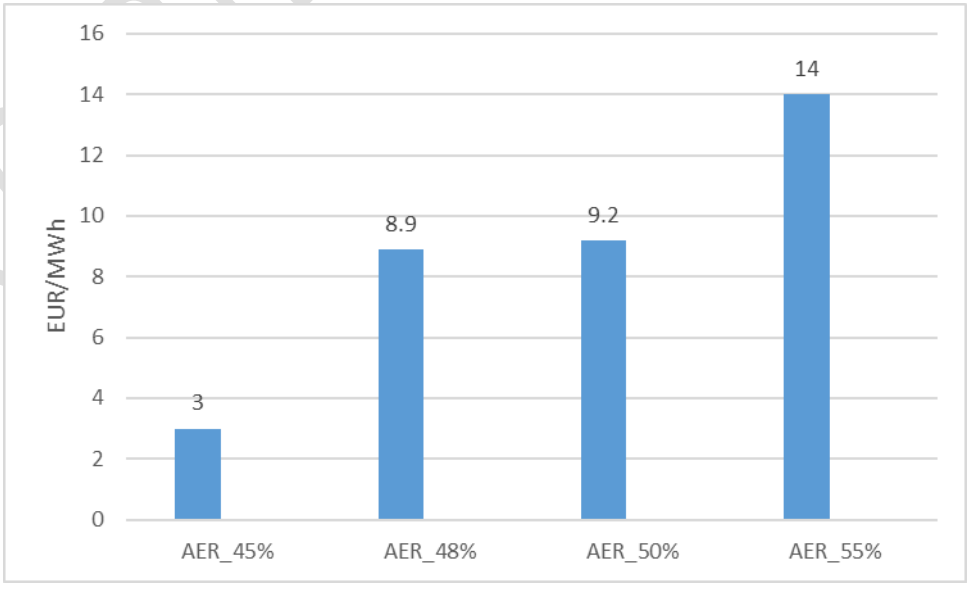


Figure 56. Average calculated additional costs of electricity production in RES target scenarios (EUR/MWh)

The additional amount of electricity produced from RES by 2030 compared to the current situation is calculated and shown in the table below.

Table 21. Additional electricity produced from RES by 2030 compared to 2016

Scenario	Additional electricity from RES (GWh)
RES_42% scenario	1033
RES_45% scenario	1414
RES_48% scenario	1555
RES_50% scenario	1582
RES_55% scenario	2138

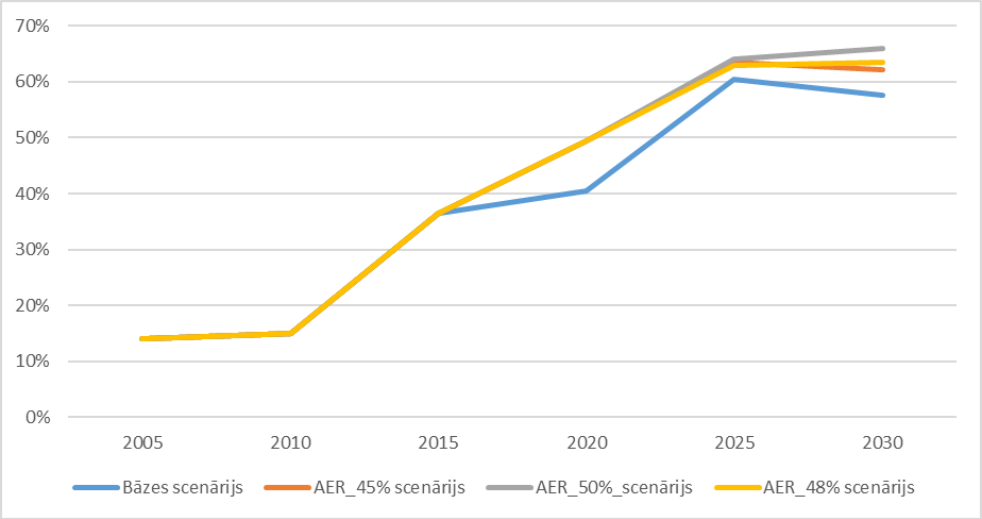


Figure 57. Share of RES in the consumption of heat in DH by 2040 according to modelled alternative scenarios (%)

Additional energy efficiency measures reduce demand for DH by about 7 % in 2030. The difference between various scenarios in the share of RES in DH by 2030 is relatively small. The share of RES in DH in the RES-50% scenario increases by 2.4 percentage points by 2030 in comparison with the baseline scenario. The increase in comparison with 2020 is an average of 8–10 percentage points.

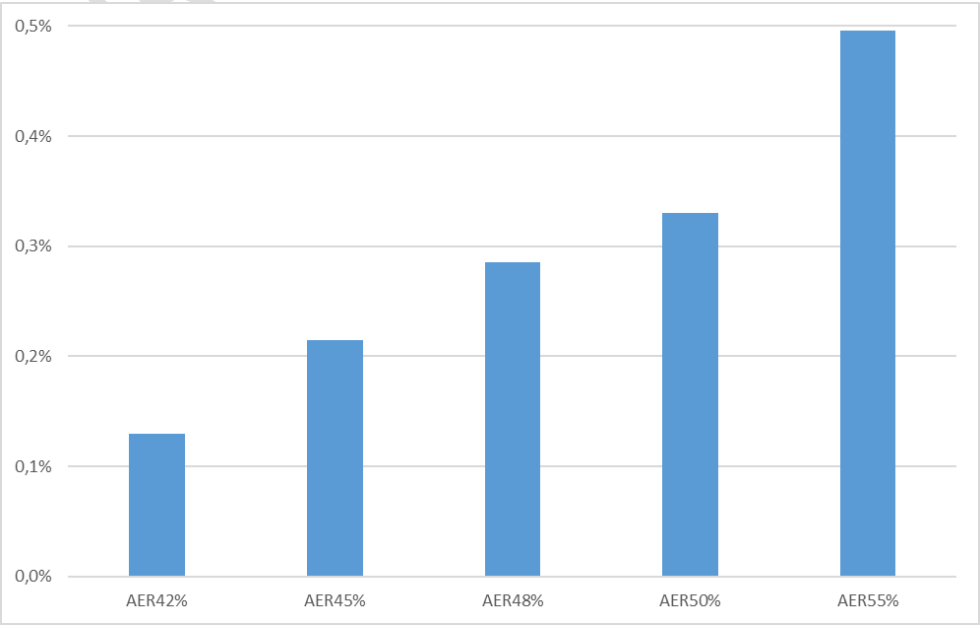


Figure 58. Calculated additional costs of modelled alternative RES target scenarios in comparison with the baseline scenario (% of GDP)

Since modelling is based on the assumptions that the costs of using RE technologies are higher than using fossil fuel technologies until 2030, benefits from reduced costs for RES fuel cannot outweigh the total increase of costs for energy systems in the alternative scenarios of RES. Total costs in the alternative scenarios of RES are compared to the baseline scenario and the calculated cost increase is applied to GDP. Costs are calculated for a 15-year period starting from 2018. A more significant increase of the total costs of the energy system is predicted in the alternative scenarios where the share of RES in the total final energy consumption exceeds 45 % by 2030.

5.1.1.3. Assessment of meeting the energy efficiency contribution

The results of modelling show that implementing energy efficiency measures in addition to the measures included in the baseline scenario allows to reduce the final energy consumption in this scenario by about 12 PJ by 2030. Considering the cost savings, energy efficiency measures in households and services (building renovation) are implemented first. Energy efficiency measures in industry and transport are implemented to a smaller extent. Of course, the result depends on the assumptions about the costs of energy efficiency measures in each of the sectors and the available potential of energy efficiency.

The largest contribution in energy savings is provided by households (50 % of the total savings) and services (28 % of the total savings), and the rest comes from industry and transport. It should be noted that the implementation of these energy efficiency measures in the baseline scenario requires implementing a policy that removes or reduces obstacles to consumers for implementing energy efficiency measures more actively. While measures in households and services will mainly be based on the reduction of energy consumption in heating (renovation of buildings), measures in transport provide for more rapid replacement of the existing vehicle fleet with more efficient vehicles, including electric vehicles. For example, increasing the excise duty on fossil fuels could be one of the policies to promote more rapid introduction of such vehicles.

Table 22. Potential and specific costs of the groups of energy efficiency measures

A sector in which the **measures are implemented**		Package of measures		
		A	**B**	**C**
Buildings	**% of net energy consumption in 2010**	**15%**	**15%**	**30%**
Private houses	EUR(2000)/GJ	100	199	272
Multi-apartment buildings	EUR(2000)/GJ	109	190	254
Services sector	EUR(2000)/GJ	50	113	181
Industry	**% of final energy consumption**	**5%**	**5%**	**5%**
EUR(2000)/GJ		81	161	322

Investments required for implementing the measures are calculated based on the potential and costs of energy efficiency.

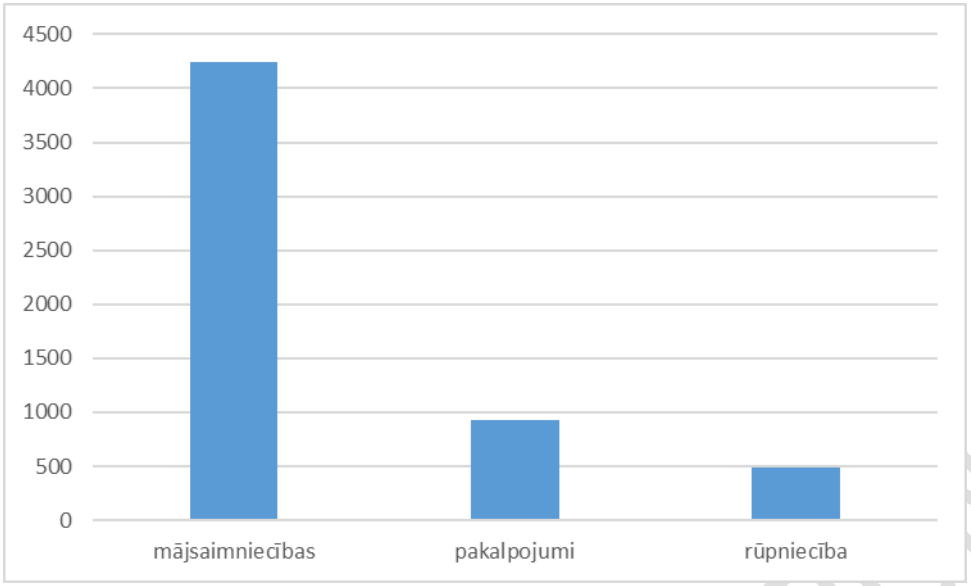


Figure 59. Estimated investments in energy efficiency measures 2020–2030 (million EUR at 2010 prices)

It should be noted that despite the fact that energy efficiency measures allow to reduce the total costs of the energy system, they require significant initial investments. Strengthening the potential of the energy efficiency market requires diverse policies and measures.

Estimated energy savings on the basis of optimum costs are 3.3 PJ in services sector, 3.4 PJ in industry, 1.4 PJ in transport, and 6 PJ in households. Estimated investments required in the period from 2020 to 2030 (at 2010 prices) are EUR 2,700 million in households, EUR 928 million in services, and EUR 1,352 million in industry.

The use of the modelling approach allows to assess the impact of energy efficiency measures on the total costs of the energy system and apply them to GDP. Thus we can show the extent to which the implementation of energy efficiency measures reduces the total costs of the energy system in relation to GDP. It is further calculated and interpreted in the macroeconomic models as additional GDP growth. The results of comparing the scenario with energy efficiency measures to the baseline scenario show that implementation of additional energy efficiency measures can reduce the total costs of the energy system over the period by about 0.1 % of GDP.

The estimated energy cost savings (considering the analysed costs over the period) (at 2010 prices) are EUR 54/MWh in households, EUR 34/MWh in services, and EUR 35/MWh in industry.

Assumptions about implementing the energy efficiency policy in the baseline scenario leading to the reduction of final energy consumption by 2030 have a positive impact on the intensity of final energy consumption. The estimated intensity of final energy consumption in the baseline scenario decreases by 35 % in 2030 compared to 2016.

5.1.2. Assessment of the mutual effects of policies

To be updated in the final version of the Plan after a policy planning document for reducing emissions of air pollutants in Latvia is developed.

5.1.3. Interaction of the current policies of Latvia and EU measures

To be updated in the final version of the Plan.

5.1.4. Other effects

To be updated in the final version of the Plan.

5.2. Overview of investments required

5.2.1. Existing investment flows and forward investment assumptions with regard to the planned policies and measures

To be updated in the final version of the Plan.

5.2.2. Sector or market risk factors or barriers in the national or regional context

To be updated in the final version of the Plan.

5.2.3. Analysis of additional public financial support or resources to address identified gaps

To be updated in the final version of the Plan.

5.3. Impact of policies and measures of the Plan on other EU Member States and regional cooperation

5.3.1. Impacts on the energy system in neighbouring and other Member States in the region to the extent possible

To be updated in the final version of the Plan.

5.3.2. Impacts on energy prices, utilities and energy market integration

To be updated in the final version of the Plan.

5.3.3. Impacts on regional cooperation

To be updated in the final version of the Plan.

6. INTEGRATED MONITORING AND REPORTING SYSTEM

According to the Proposal for the Regulation on the Governance of the EnU, a biennial integrated national energy and climate progress report covering all five dimensions of the Energy Union shall be submitted to the EC. It shall cover the following elements:

- information on the progress accomplished towards reaching the targets, objectives and contributions set out in the Plan, and towards implementing the policies and measures necessary to meet them;
- overview of the actual investments compared to the initial investment assumptions;
- information on the progress accomplished towards establishing a multilevel climate and energy dialogue;
- integrated reporting on renewable energy and latest information about policies and measures in this dimension;
- integrated reporting on energy efficiency and latest information about policies and measures in this dimension;
- integrated reporting on energy security and latest information about policies and measures in this dimension;
- integrated reporting on the internal energy market and latest information about policies and measures in this dimension;
- integrated reporting on energy poverty and latest information about policies and measures in this dimension;
- integrated reporting on research, innovation and competitiveness and latest information about policies and measures in this dimension;
- information on adaptation to climate change;
- impact of the policies and measures of the Plan on air quality and emissions of air pollutants.

In addition to the integrated national energy and climate progress report, the following shall be prepared and submitted to the EC biennially:

- integrated report on greenhouse gas policies and measures and on projections;
- integrated report on national adaptation actions, financial and technology support provided to developing countries and auctioning revenues.

Therefore every two years Latvia has to submit at least three interconnected reports as an assessment of the progress of the Plan, with one of them covering all the dimensions of the Plan and the other two covering the decarbonisation dimension; the same statistical data and assumptions have to be used and the same policies and measures have to be analysed in all three reports.

Latvia will have to implement major changes in the regulatory framework and in the institutional capacity in order to be able to comply with the monitoring and reporting obligations provided for in the Proposal for the Regulation on the Governance of the EnU.

In order to ensure appropriate implementation of the integrated reporting obligation provided for in the Proposal for the Regulation on the Governance of the EnU, it is necessary to establish an efficient monitoring and reporting system in Latvia that lays down the authorities responsible for ensuring compliance with the monitoring and reporting obligations as well as the procedure for

data and information exchange to avoid repeated collection and assessment of data and information that is already available.

The Law On Pollution and Cabinet Regulation No. 737 of 12 December 2017 "Rules for Establishing and Maintaining the National System of Preparing the Greenhouse Gas Inventory and Projections" currently include provisions for assessing the progress achieved in meeting GHG emission and CO_2 removal targets and biannual reports on the progress — report on the progress, measures and projections — as well as provide for the national system for the greenhouse gas inventory and the national system for preparing greenhouse gas projections.

In order to ensure appropriate implementation of the integrated monitoring and reporting system, it is necessary to designate a single direct state administration authority — a competent authority subordinated to a ministry that will perform the monitoring and collect and analyse the data and information required for the integrated reporting. Since monitoring and reporting data have to be completely coordinated in all the dimensions of the Plan, the respective authority should also provide monitoring and reporting functions with regard to GHG emissions and CO_2 removals. Whereas if the respective authority will not be able to ensure monitoring of certain data or if such monitoring is already being carried out, the authority will receive, process, and include these data in the integrated report.

If there is no such authority with specific competence and expert knowledge at the time of developing and approving the Plan, it is necessary to extend the scope of obligations and capacity of an existing authority after approving the Plan.

Establishment and implementation of the integrated monitoring and reporting system will require additional financial resources, and attraction of financing from EU funds is possible for this purpose. To minimise the impact on the state budget and avoid establishing new authorities, it is possible to designate an authority subordinated to a ministry as the competent authority for performing the functions of the integrated monitoring and reporting system.

The Ministry of Economics is currently planning to dedicate about EUR 103,600 each year in the period from 2018 to 2020 for the execution of the functions laid down in the Energy Efficiency Law, which is only a small portion of the obligations of integrated reporting on energy efficiency.

One of the objectives of the tender "Analytical Framework for Long-Term Planning of the National Energy Policy" of the NRP "Energy" for the period from 2018 to 2021 is to ensure, among other things, "development of a system for monitoring the results of implementing the national energy policy according to the requirements of the EU legislation by identifying the necessary data and indicators for monitoring as well as interpreting them". Therefore the design of the monitoring system for preparing the integrated system, including the institutional system and the system for acquiring information and data flows, will be clear after this tender process is completed, and it will also be possible to estimate the costs for establishing and maintaining the system for preparing the integrated progress report (administrative costs and compliance costs) as well as the actions required for implementing this system.

7. REVIEWING AND UPDATING THE PLAN

According to the Proposal for the Regulation on the Governance of the EnU, Latvia shall prepare and submit to the EC a draft update of the Plan or a reasoned justification as to why it is not necessary to update the Plan by 30 June 2023. The final version of the Plan shall be submitted to the EC by 30 June 2024 if Latvia does not provide a reasoned justification as to why it is not necessary to update the Plan or if the EC concludes that the arguments are not justified. Updating the Plan.

According to the Proposal for the Regulation on the Governance of the EnU, the targets, objectives and contributions included in the Plan can be changed in the updated version so that they are equal or more ambitious than those set in the current Plan. Latest EC recommendations and recommendations to Latvia in the context of the European Semester, as well as obligations arising from the Paris Agreement have to be taken into consideration in the updated version of the Plan. According to the Proposal for the Regulation on the Governance of the EnU, the updated version of the Plan should strive to reduce any negative impact on the environment identified in the integrated report, which is described in Chapter 6 of the Plan.

Latvia can also make changes and adjustments to the national policies set out in the Plan at any time under the condition that such changes and adjustments are included in the integrated report referred to in Chapter 6 of this Plan.

It is clear that updating the Plan, possibly before the first deadline for submitting the updated version laid down by the Proposal for the Regulation on the Governance of the EnU, will be required due to the following reasons:

- work on the development of the National Development Plan of Latvia for the period after 2021 has been started;
- work on preparing the information and data for the new National Reform Programme of Latvia for the period after 2021 will start shortly;
- in the two years after approving the Plan in Latvia and the EC, work on developing new or updating the existing sectoral programming documents for the period after 2021 will start, including Environmental Policy Guidelines, Strategic Plan of the Common Agricultural Policy, Long-term Renovation Strategy, Guidelines for the Development of Forestry and Related Sectors, Transport Development Guidelines, National Industrial Policy Guidelines, and Guidelines for the Development of Science, Technology and Innovation (including Smart Specialisation Strategy).

Annex 1

Connection of the policy context of the Plan with the current policy planning documents of Latvia and their policies

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
SDSL2030[252]	1) Renewable energy 2) Energy efficiency 3) Energy security 4) Internal energy market 5) Research, innovation and competitiveness	To ensure energy independence of the country by increasing self-sufficiency of energy and integrating in the EU energy networks.	**Energy security and independence** • Development of energy interconnections • Increasing the capacity of energy supply and regionalisation • Decentralised energy production and micro generation **Use of RES and innovation** • Use of biomass for producing heat and electricity • Use of straw, reed and peat in heating • Developing the potential of wind energy • Development of solar energy • Use of hydroelectric power • Use of biogas resources • Use of biofuels • Cooperation between research institutions and businesses in the field of RE **Energy efficiency measures** • Renovation of multi-apartment buildings and reduction of heat consumption • Increasing the efficiency of heat production • Investments in district heating systems

[252] http://polsis.mk.gov.lv/documents/3323

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			• Reducing losses in electricity transmission and distribution • Increasing energy efficiency of electric vehicles and links with other means of transport • Energy efficient lighting in cities • Promoting rational consumption of energy in households • Criteria of public procurement tenders should include energy efficiency and considerations for product life cycle analysis **Energy efficient and environmentally friendly transport policy** • Environmentally friendly transport • Availability of broadband internet and e-services • Pedestrian streets, bicycle lanes and green corridors **Innovative and eco-efficient economy** • User-driven innovation agency • Cooperation between scientists and businesses in research • Cooperation innovation programme • Internationalisation of research and development • Cluster development programme • Procurement of open-source software • Digital licensing of intellectual property • Strengthening the international competitiveness of research institutions • Venture capital industry • R&D tax credit • Innovation bonds of pension funds • Innovation procurement programme • Innovation guarantees

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
	4) Decarbonisation	– To be the EU leader in the preservation, increase, and sustainable use of natural capital – To preserve the originality of Latvia — the diverse natural and cultural heritage, typical and unique landscapes	• Green budget reform • Taxes and duties for using natural capital • Innovation programme • Environmental eduction programmes encouraging change • Restructuring of the forestry sector • Development of the agrarian industry • Innovation and modernisation in agriculture • Soil improvement measures • Use of biomass • Afforestation of lands
NDPL2020[253]	1) Renewable energy 2) Energy efficiency	To ensure sustainable use of the energy resources required by the national economy by promoting the availability of a market for the resources, decrease of the energy intensity and emission intensity in certain sectors, and increase of the proportion of RE in the total consumption, while focusing on competitive energy prices	• Development of energy plans for municipalities by prescribing measures for promoting energy efficiency and transition to RES • Energy performance programmes for public and municipal buildings • Support programmes for the energy performance of residential buildings and transition to RES • Support for innovative projects related to energy and energy efficiency technologies • Support programmes for transitioning to RES in the transport sector and providing the necessary infrastructure by supporting only alternative energy sources that are cost-effective and by supporting innovation that results in the use of cost-effective alternative energy sources • Use of RES in the production of energy by reducing dependence on fossil energy and promotion of energy efficiency in district heating • Development of energy infrastructure networks
	1) Decarbonisation	To maintain the natural capital as the basis for sustainable	• Stimulating sustainable use of land and other natural resources and biodiversity by using environmentally friendly technology

[253] http://polsis.mk.gov.lv/documents/4247

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
		economic growth and promote its sustainable use while minimising natural and human risks to the quality of the environment	• Broader provision of energy efficient and ecological goods and services in public procurements (green public procurement) • Expanding the use of water bodies and agricultural land for the production of food, including by improving the infrastructure for the public water management • Improving soil fertility and the value of forest resources by minimising the impact on the environment and using environmentally friendly technologies • Sorting waste and recycling separately collected waste
NRPL2020[254]	1) Renewable energy 2) Energy efficiency 3) Decarbonisation 4) Innovation, research and competitiveness	– Improving the business environment, efficient use of EU funds, provision of financial access to companies with the aim of supporting productive investment – Ensuring balanced development of the economy by promoting the development of marketable sectors and increasing productivity	**Energy efficiency improvement** • Insulation of buildings • Increasing energy performance of public and industrial buildings • Introducing efficient lighting infrastructure in public areas of municipalities • Increasing energy efficiency in heat production • Increasing energy efficiency in the transport sector **Increasing the share of renewable energy** • Alignment of the legal framework • Ensuring financial resources for the production of renewable energy • Promotion of the use of biofuels in the transport sector **Reduction of greenhouse gas (GHG) emissions** • Limiting emissions from non-ETS sectors • Research, innovation, public awareness **Increasing investments in research and development (R&D)** • Promoting innovation • Support for the development of innovative economic operators

[254] http://polsis.mk.gov.lv/documents/4294

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			• Increasing the capacity of the technical library of patents and introducing new support services • Developing the potential of scientific activity • Establishment of a platform for long-term cooperation of businesses and researchers
LTESL2030[255]	1) Renewable energy 2) Energy efficiency 3) Energy security 4) Internal energy market 5) Decarbonisation	Competitive economy with a sustainable energy sector and increased security of energy supply: – Ensure 50 % share of renewable energy in gross final energy consumption – Reduce average energy consumption for heating by 50 % – Reduce imports of energy and energy sources from the existing third country suppliers by 50 %	**Sustainable energy** • In the short term, establishing considerably higher cost-efficient classes of mandatory construction standards for the thermal stability of new and renovated buildings, as well as voluntary classes, including zero energy consumption buildings • Promoting an intensive support programme for increasing energy efficiency of the current housing fund and public buildings, especially in the sector of multi-apartment buildings where greater return is expected from such support mechanisms • Promoting the introduction of smart meters by raising consumer awareness of their energy consumption and providing the opportunity to control and decrease the amount of energy consumed • Imposing higher requirements for district heating systems with regard to the reduction of energy loss in networks by assessing the effectiveness of investments and reducing the benchmark of loss to 10 % in 2030 • Incentivising the connection of new consumers to efficient district heating systems, including by limiting the installation of inefficient autonomous heating plants using fossil fuels where district heating is available • Prescribing heating service providers to allocate 1.5 % of their annual turnover to the provision of energy maintenance services • Promoting the improvement of energy efficiency of small and medium enterprises by introducing the energy audit and energy management system Strengthening the role of industry associations by triggering discussion about determining energy consumption benchmarks in the industry

[255] http://polsis.mk.gov.lv/documents/4849

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			Providing state aid for implementing measures for increasing energy efficiency in industry • Fostering a wider introduction of the "green procurement" principle, which will contribute to saving energy resources by performing an analysis of the life cycle of goods and services and minimising environmental impact • Promoting the model role of the public sector in implementing energy efficiency measures in transport, buildings, and heating with the help of pilot projects and public sharing of information about such projects, including regarding opportunities to attract public and private financing • Applying state aid exception for the achievement of a particular objective in the medium term (until 2020) and securing direct high intensity support in district heating systems for the transition to RES • Providing support for the development of RES within the framework of the national financial instrument for energy, especially in research and development (R&D) projects, technology transfer, and establishment of their production basis • Introducing requirements and support mechanisms for promoting the use of RE technologies in new and renovated buildings with a view to facilitating the integration of new RES systems in district heating systems • Developing an efficient and transparent regulatory framework for the development of onshore and offshore wind energy, providing for particular conditions for the research, construction, and operation of wind farms. Such framework will facilitate the monitoring of wind energy at national level and ensure a clearly defined investment environment for potential developers of this energy • Promoting wider use of RES in public transport, including by implementing further electrification of railway transport and performing modifications of public transport to transition to using biofuels • Refusing direct state support for 1st generation biofuels, retaining the requirement of addition of biofuels to fossil fuel in the medium term • Developing a state aid mechanism to facilitate the production of 2nd

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			generation biofuels • Ensuring compliance of the use of RES (including biomass and biofuels) with sustainability criteria and a positive impact of RES on related sectors by defining a clear regulatory framework and compliance control principles • Developing the infrastructure for private electric vehicles by ensuring the introduction of a common charging network standard • Developing a new electricity production support instrument according to the following principles: flexibility of energy volume, reasonable costs, reaction to market signals and technological neutrality, as well improvement of the system of certificates of origin • Assessing the competitiveness risks of energy intensive companies of export industries with a view to mandatory procurement component growth forecasts • Establishing a long-term principle for net metering of low-power electricity production plants in distribution networks with a 12-month payment period • Promoting the use of waste for energy production, which would allow increasing the use of local energy resources and at the same time solve the waste utilisation problem in the country **Increasing the security of energy supply** • Ensuring a flexible and secure energy supply network on the national scale, considering the ever-increasing expansion of micro generation and the resulting changes in the energy portfolio of Latvia. Energy generated in the decentralised micro generation process can be efficiently integrated in the network only on the condition that energy supply networks are carefully monitored, their operation and development are analysed and planned, and an efficient balancing of network capacities is ensured • Providing support for key national scale energy infrastructure projects within the framework of the national financial instrument for energy • Developing capacity for the assessment of the impact of energy policy by fully covering the direct and indirect costs of energy policy to consumers and benefits for the economy in general, including alternative costs and

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			local pollution • Ensuring national social support in the energy sector by, among other things, implementing social support measures for consumers of a certain status to prevent energy poverty and ensure the availability of energy at appropriate and affordable price to any resident of Latvia • Ensuring liberalisation of the energy market by facilitating the entry of new participants to the market, by promoting the diversification of energy supply sources and channels on the regional scale, and raising public awareness regarding its benefits and obligations in an open and efficient energy market • Continuing close cooperation with regional partners within the framework of the Baltic Energy Market Interconnection Plan (BEMIP) and Connecting Europe Facility (CEF) based on solidarity and mutual financial support principles and balancing national and regional interests for mutually beneficial solutions (e.g. development of natural gas supply and storage infrastructure) • Continuing the integration of the electricity market of Scandinavian countries and Baltic States within the framework of the exchange NordPool Spot, including trading in future financial instruments, by establishing a single price area and developing economically justified regional interconnections, reducing rapid electricity price fluctuations, increasing market liquidity, and giving signals for the development of new capacities, including RES • Establishing an efficient and open regional natural gas market by transposing the Third Energy Package of the EU and supporting the diversification solutions for natural gas supplies in the Baltic region, including the development of the regional liquefied natural gas terminal, natural gas interconnections between Poland and Lithuania and between Finland and Estonia, as well as by increasing the capacity of the regional natural gas storage facility • Developing market preconditions for only economically justified regional projects of low carbon base load capacity by refusing direct state aid for

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			new base load projects • Improving the security of fuel supply by improving the functioning of the Central Stockholding Entity (CSE) with more efficient response mechanisms in crisis situations • Facilitating the potential of the extraction of local energy resources, including peat extraction and further research of the potential of shale gas and oil, as well as adopting a regulatory framework for strengthening the investment environment for research and extraction of hydrocarbons
EDG2020[256]	1) Renewable energy 2) Energy efficiency 3) Energy security 4) Internal energy market 5) Decarbonisation	To increase the competitiveness of the national economy by promoting the security of supply, pricing of energy sources and energy on the basis of the free market and competition, and sustainable energy production and consumption	**Diversification of primary energy sources** • Promotion of research and extraction of primary energy sources in Latvia • Facilitating the diversification of energy supply routes and sources • Waste recycling **Establishment of an efficient energy market** • Active participation in the development of EU network codes in order to improve the EU energy market • Reducing the risk of price fluctuations in the wholesale trade of electricity • Liberalisation of the energy market for households • Separating natural gas transmission and storage services from trading and distribution services **Efficient energy infrastructure** • Simplifying the process of implementing PCI projects • Improving the electricity transmission system infrastructure • Improving the security of the electricity distribution system and modernisation of the electrical grid • Improving the infrastructure for transmission, distribution, and storage of natural gas • Improving the regulatory framework for other types of infrastructure

[256] http://polsis.mk.gov.lv/documents/5499

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			Efficient thermal energy market • Improving the regulatory framework • Establishment, improvement, and development of infrastructure **Increasing the share of renewable energy** • Implementing measures for increasing the share of RE in gross final energy consumption • Implementing measures for increasing the share of energy from RES in the final energy consumption in transport **Improved energy efficiency** • Improving and implementing the regulatory framework • Increasing energy efficiency in buildings • Increasing energy efficiency in industry • Raising awareness and informing the society about the benefits of energy efficiency • Introducing requirements for ecodesign **Efficient crisis management** • Ensuring energy supply in the economy in case of threats • Ensuring oil reserves **Strengthening international and regional cooperation** • Active involvement in the work of BEMIP • Promoting cooperation with Estonia and Lithuania and other countries in the region • Coordinating the energy priority of the Strategy for the Baltic Sea Region • Facilitating active participation of Latvia in international organisations **Information to the public about developments in the energy sector** • Raising public awareness of developments in the energy sector • Providing the institutional framework for cooperation between national authorities and business community

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			• Facilitating the development of smart specialisation in energy
PAEEPM2020[257]	1) Energy efficiency 2) Decarbonisation	To ensure implementation of alternative measures in: - industry - households - services - transport - agriculture, forestry, and fisheries - implementation of alternative measures covering several sectors	Reaching the mandatory target of final energy consumption savings, 9,896 GWh accumulated in the period from 2014 to 2020 • Energy efficiency measures for large enterprises • Energy efficiency measures for large electricity consumers • Energy management in national authorities and municipalities • Optional agreements about energy efficiency • EAAI, CCFI • ESF programmes in various sectors (transport, agriculture, welfare, culture, etc.) for renovating buildings and equipment, and measuring energy efficiency as an additional benefit • Building renovation funded by local governments
CIPEE[258]	1) Energy efficiency 2) Decarbonisation	- Optional national energy efficiency target — primary energy savings of 0,670 Mtoe (28 PJ) in 2020 - Target for renovating central government buildings — 3 % of the total floor area each year (maximum estimates — a total of 678,460 m^2), which, together with the renovation of local government buildings, amounts to energy savings of 0.016 Mtoe (0.67 PJ, 186 GWh) in the period	• Energy Efficiency Obligation Scheme • Promotion of energy efficiency in residential and public buildings (ESF programmes) • Promotion of energy efficiency in heating (ESF programmes) • Increasing energy efficiency in industry (ESF programmes)

[257] http://polsis.mk.gov.lv/documents/5921
[258] http://polsis.mk.gov.lv/documents/4572

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
		from 2014 to 2020 - Target for final energy savings — mandatory energy savings in the amount of 1.5 % of the energy supplied to final consumers — 0.213 Mtoe (8.9 PJ)	
LTRS[259]	1) Energy efficiency 2) Decarbonisation	Current objectives in the area of energy performance of buildings: – availability of funding for economically justified projects in the entire territory of Latvia, including regions; – high-quality management and monitoring of projects; – focusing of monitoring of activities on obtaining results, including energy savings; – reaching a high level of energy efficiency and high quality of construction; – improving a selection procedure of construction enterprises; – reducing costs of resources.	• Establishing a new financial instrument for situations when a multi-apartment building requires investments in maintaining the residential building or implementing energy performance measures but payments in the reserve fund have not been made in a sufficient amount (or at all) • Promoting the development of ESCO services. ESCO with a bank guarantee or insurance policy are responsible for the energy performance to be achieved within a project. ESCO cover losses caused to the inhabitants of multi-apartment buildings if the specified energy savings level is not reached after the completion of the renovation project • Continuing the education of potential project proposers and implementers within the information campaign *Live Warmer*, including by organising educational seminars and conferences in the area of energy efficiency not only in the multifamily housing sector but also in the public sector • Reviewing and laying down minimum energy performance requirements for buildings on a regular basis to achieve a cost-optimal balance between financial investments and energy savings over the life cycle of a building • Developing support instruments for the construction of nearly zero-energy consumption buildings in accordance with Article 10(1) of Directive 2010/30/EU

[259] http://polsis.mk.gov.lv/documents/6043

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
EPG2020[260]	1) Decarbonisation	– to make sure Latvia contributes towards mitigating global climate change, taking into account its environmental, social, and economic interests; – to help Latvia prepare to adapt to climate change and its effects.	**Reduction of GHG emissions and ensuring CO_2 removals** • Implementing GHG reduction measures across all sectors of the economy, while at the same time shifting the country onto a sustainable, low carbon and cost-effective development pathway • Integrating climate policy objectives into other sectoral policies by defining the responsibility of each sector as well as fostering cooperation between the state, local authorities, and the private sector **Adaptation to climate change** • Implementing effective adaptation measures and integrating these into spatial development planning and sectoral policies with a view to mitigating and adapting to climate change • Reducing flood risk and managing the aftermath of floods **Accounting and forecasting GHG emissions** **Educating the public about climate change and climate change adaptation and involving citizens in policy-making and implementation**
AFDP2020[261]	1) Renewable energy 2) Energy efficiency 3) Decarbonisation	To promote the development of alternative fuels and reduce the negative impact of transport on the environment	**Comprehensive infrastructure for alternative fuels in Latvia, reduction of GHG emissions in road transport** • Evaluating and determining the most effective scenarios for the economy of Latvia for introducing alternative fuels • Improving the regulatory framework • Establishment and development of infrastructure for alternative fuels • Informing the public
National Waste Management Plan 2013–2020[262]	1) Decarbonisation	– To reduce the waste stream by increasing waste recycling by 50–80 % depending on the type of	• **Preventing** the production of waste as a result of economic growth and **ensuring** a significant reduction of the total amount of waste by using all the best available opportunities and the best available techniques for preventing waste generation by ensuring higher resource efficiency and

[260] http://www.varam.gov.lv/lat/pol/ppd/vide/?doc=17913
[261] http://polsis.mk.gov.lv/documents/5893
[262] http://polsis.mk.gov.lv/documents/4276

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
		waste – To develop and raise environmental awareness and green thinking with a view to reducing climate change, consumption of natural resources and energy, and environmental pollution	promoting the development of a more sustainable consumer behaviour model • **Ensuring** rational use of waste as a resource • **Ensuring** that the waste generated is not hazardous or does not pose a significant risk to the environment or human health, that the waste is returned to the economic cycle, especially with the help of recycling, or is returned to the environment in a favourable way (e.g. composting), and that waste is recycled as close to place it is generated as possible • **Ensuring** the reduction of the amount of waste to be disposed of and disposal in a manner that is safe to human health and the environment
Rural Development Programme of Latvia 2014–2020[263]	1) Renewable energy 2) Energy efficiency 3) Decarbonisation	– To foster knowledge transfer and innovation in agriculture, forestry, and rural areas – To enhance the viability of agricultural holdings and competitiveness of all types of farming in all regions and promote innovative farming technologies and sustainable forest management – To promote food chain organisation, including processing and marketing of agricultural products, animal welfare, and risk management in agriculture – To restore, preserve, and enhance ecosystems related	Knowledge transfer and innovation in agriculture, forestry, and rural areas • Fostering innovation, cooperation, and the development of the knowledge base in rural areas • Strengthening the links between agriculture, food production and forestry and research and innovation, including for the purpose of improved environmental management and performance • Stimulating lifelong learning and training in agriculture and forestry Enhancing viability and competitiveness of agricultural holdings, promoting the introduction of innovative technologies in agriculture • Improving the economic performance of all farms and facilitating farm restructuring and modernisation, especially with a view to increasing market participation and orientation as well as agricultural diversification • Facilitating the entry of adequately skilled farmers into the agricultural sector and especially generational renewal Promotion of food chain organisation, animal welfare, and risk management in agriculture • Improving competitiveness of primary producers by better integrating them into the agri-food chain through quality schemes, adding value to

[263] https://www.zm.gov.lv/zemkopibas-ministrija/statiskas-lapas/latvijas-lauku-attistibas-programma-2014-2020-gadam?id=14234#jump

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
		to agriculture and forestry – To promote resource efficiency and support the shift towards a low carbon and climate resilient economy in agriculture, food, and forestry – To promote social inclusion, poverty reduction, and economic development in rural areas	agricultural products, promotion in local markets, and short supply circuits, producer groups and inter-branch organisations • Supporting farm risk prevention and management Restoring, maintaining, and promoting ecosystems related to agriculture and forestry • Restoring, preserving, and enhancing biodiversity (including in Natura 2000 sites and in areas facing natural or other specific constraints) and high nature value farming, as well as the state of European landscapes • Improving water management, including fertiliser and pesticide management • Preventing soil erosion and improving soil management Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food, and forestry • Increasing efficiency in energy use in agriculture and food processing • Promoting supply and use of RES, by-products, waste, residues, and other non-food raw materials for the purposes of bioeconomy • Reducing green house gas and ammonia emissions from agriculture • Fostering carbon conservation and sequestration in agriculture and forestry Promotion of social inclusion, poverty reduction, and economic development in rural areas • Facilitating diversification, establishment and development of small enterprises, and job creation • Fostering local development in rural areas
GDFRS2020[264]	1) Decarbonisation 2) Renewable energy 3) Energy security	– Forest management in Latvia is sustainable and recognised globally – Latvian forestry products are competitive, have a high	**Efficient and sustainable management of forests and forest land** • Ensuring the availability of forest resources now and for future generations • Increasing cooperative management of forests • Maintaining biodiversity at the current level

[264] http://polsis.mk.gov.lv/documents/5331

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
		added value, and meet customer needs – Educational and scientific potential and human skills correspond to the development of the forestry industry and related sectors	**Reduction of forest management risks** • Reducing the formation of deadwood in forest stands **Strengthening forestry competitiveness** • Increasing forestry exports of processed wood • Increasing the share of further processing **Development of new timber products and companies** • Decreasing exports of logs and wood processing by-products **Strengthening forest research** • Increasing the competitiveness and global recognition of forest research institutes • Increasing the income of forest research institutes from R&D services provided to forestry companies **Strengthening education in forestry** • Increasing the number of students in educational programmes related to forestry and wood processing and competition for state-funded studies **Informing and educating the public and forest owners** • Improving knowledge and raising awareness of the public about sustainable forest management and use of wood products • Increasing the share of managed private forests
TDG2020[265]	1) Renewable energy 2) Energy efficiency 3) Decarbonisation	Competitive, sustainable, and co-modal transport system that ensures high quality mobility through efficient use of resources, including EU funds	**Latvia —sustainable provider of transport and logistics services** • Reducing the length of roads covered with asphalt in bad and very bad condition by 57 % compared to 2012 • Competitive railway infrastructure • Rīga — dynamically growing air traffic centre of the Baltic region and

[265] http://polsis.mk.gov.lv/documents/4607 a

EC courtesy translation LV NECP

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			Northern Europe • Improved transport safety **Ensuring internal and external accessibility and opportunities for high quality mobility in the entire territory of the country** • Ensuring possibilities for all inhabitants to get to the centre of the municipality, attend educational institutions, get to work, national and municipal authorities during the normal opening hours by public transport • Creating preconditions for the development of regional airports **Increasing energy efficiency and promoting electric mobility** • Increasing the role of electric mobility
AFDP2020[266]	1) Renewable energy 2) Energy efficiency 3) Decarbonisation	To establish the necessary directions of research and analysis with the aim of developing further policies regarding the introduction of alternative fuels in certain sectors of transport to reduce greenhouse gas emissions	**Promoting the development of alternative fuels and reducing the negative impact of transport on the environment** • Carrying out a comprehensive study about the scenarios of introducing alternative fuels in road transport to reduce greenhouse gas emissions and its impact on the economy of Latvia • Evaluating possibilities for setting the minimum excise duty rate for sustainable biofuels (both liquid and gaseous) considering the calorific value of biofuels. Gradual streamlining of excise duty rates for gaseous fuels (natural gas and petroleum gas) considering the calorific value of gaseous energy[267] • Considering simplification of administrative procedures for establishing EV charging points that are not public • Evaluating opportunities for promoting the purchase of EVs • Assessing the necessity and the economic justification for establishing LNG refuelling points in ports (on the TEN-T core network) • Performing a study about the proportionality of demand and costs for electricity supply to ships in ports in comparison with environmental

[266] http://polsis.mk.gov.lv/documents/5893
[267] The measure has been changed by Guidelines of the National Taxation Policy for 2018–2021 (Cabinet Order No. 245 of 24 May 2017)

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			benefits considering the initial assessment within the Plan **Improving the regulatory framework** • Updating legislation by laying down requirements for CNG, LNG, and FCEV filling stations • Updating legislation by laying down requirements for EV charging stations as well as operators of EV charging points • Amending legislation by adding the definitions of EV, FCEV, natural gas vehicle, and zero emission vehicle • Updating legislation regarding the information to be provided to the users of alternative fuel vehicles at CNG, LNG, and FCEV filling stations • Updating legislation regarding the information to be provided to the users of alternative fuel vehicles at EV charging stations, owner manuals, and points of sale • Facilitating the purchase of vehicles using CNG, LNG, fuel cells, biofuels as well as paraffinised and synthetic fuels from RES **Establishment and development of infrastructure for alternative fuels** • Developing EV charging infrastructure on TEN-T roads • Developing EV charging infrastructure on other roads (regional roads connecting TEN-T roads, towns, and populated areas) • Developing CNG filling infrastructure • Establishing filling stations for vehicles using biofuels and paraffinised and synthetic fuels from RES • Developing environmentally friendly public transport infrastructure (for buses) by providing more support to zero-emission vehicles (according to Transport Development Guidelines 2014–2020) • Developing environmentally friendly public transport infrastructure (for railway transport) (according to Transport Development Guidelines 2014–2020) • Promoting alternative fuel vehicles

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
			Informing the public • Raising public awareness about the plan of introducing alternative fuels in Latvia • Involving non-governmental organisations in designing the alternative fuel development policy
GDSTI2020[268]	Research, innovation, competitiveness	Promotion of cooperation between science and industry and commercialisation of research results	**Promotion of cooperation between science and industry and commercialisation of research results** • Establishing a common technology transfer platform that involves establishment of 2–3 technology transfer centres and expanding technology transfer services by providing support to the protection of intellectual property and verifying the economic and technical feasibility of research results and the development and implementation of strategy (proof of concept fund) in companies • Supporting innovative research for the private sector and commercialisation of research results according to the Smart Specialisation Strategy with the following priority areas: smart energy, research intensive bioeconomy, smart materials, technologies and engineering systems, information and communication technologies, biomedicine, medical technologies, biopharmacy, and biotechnology • Developing competence centres as a long-term cooperation platform for scientific institutions and economic operators by providing support for carrying out research commissioned by the industry and implementing product development projects to co-finance both individual and collaborative projects
NIPG2020[269]	Research, innovation,	To promote structural changes in the economy for	***4. Increasing innovation capacity*** • Supporting the development of new products and technologies in the

[268] http://polsis.mk.gov.lv/documents/4608
[269] http://polsis.mk.gov.lv/documents/4391

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
	competitiveness	the benefit of producing goods and services with higher added value, including increasing the role of industry, modernising industry and services, and developing exports of more complex goods	form of both individual and partnership projects • Supporting the implementation of industry research and cooperation with universities for increasing labour capacity in innovative technologies • Supporting companies in the development and introduction into production of environmentally friendly and energy efficient products and technologies ***6. Reducing energy costs*** • Implementing the audit of the MPC support mechanism with the aim of reducing the overall MPC burden on electricity consumers by not creating other challenges to the economy • Developing a state aid programme for promoting energy efficiency, especially in order to reduce energy consumption
Regional Policy Guidelines 2013–2019	Research, innovation, competitiveness	To provide equal employment and social conditions for all inhabitants regardless of their place of residence by promoting business in regions, developing high quality transport and communication infrastructure and public services, and to strengthen the international competitiveness of Latvia and its regions by enhancing the international role of	Medium term objectives of the regional policy: 1. Promoting regional business development and job creation, facilitating accessibility of jobs and services, and improving the quality and availability of services 2. Strengthening the capacity and role of regions and local governments in promoting the development of their territories

Policy planning document	Dimension covered by the Plan	Objective	Main policies defined in the existing policy planning document for reaching the objective
		Rīga and other larger cities of the country	

Annex 2

Indicative connection of the ERDF and the CF with the Plan

Table 1. Indicative information about the consistency of the common result indicators of the ERDF and the Cohesion Fund with the indicators of the Plan

Policy objective	Results of ERDF and CF[270]	Results of the Plan[271]
1. A smarter Europe by promoting innovative and smart economic transformation	RCR[272]01 — Jobs created in supported entities RCR 02 — Private investments matching public support (of which: grants, financial instruments) RCR 03 — SMEs introducing product or process innovation RCR 04 — SMEs introducing marketing or organisational innovation RCR 05 — SMEs innovating in-house RCR 06 — Patent applications submitted to European Patent Office RCR 07 — Trademark and design applications RCR 08 — Public-private co-publications	• Turnover of innovative products • Share of innovative enterprises • Share of exports from high technology sectors • Number of registered intellectual property items and income from them • Number of scientific employees • Foreign financing invested and attracted to research and innovation
	RCR 11 — Users of new public digital services and applications RCR 12 — Users of new digital products, services and applications developed by enterprises RCR 13 — Enterprises reaching high digital intensity RCR 14 — Enterprises using public digital services	

[270] Proposal for a Regulation of the European Parliament and of the Council on the European Regional Development Fund and on the Cohesion Fund
Proposal for a Regulation of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, and the European Maritime and Fisheries Fund and financial rules for those and for the Asylum and Migration Fund, the Internal Security Fund and the Border Management Instrument
The agreement on the list of indicators has not been reached yet, so they may change significantly
[271] Units of the outcomes according to the draft Plan
[272] RCR: Regional Policy Common Result Indicator.

Policy objective	Results of ERDF and CF[270]	Results of the Plan[271]
	RCR 16 — High growth enterprises supported RCR 17 — 3-year-old enterprises surviving in the market RCR 18 — SMEs using incubator services one year after the incubator creation RCR 19 — Enterprises with higher turnover RCR 25 — Value added per employee in supported SMEs	
	RCR 24 — SMEs benefiting from activities for skills development delivered by a local/regional ecosystem RCR 97 — Apprenticeships supported in SMEs RCR 98 — SMEs staff completing Continuing Vocational Education and Training (CVET) (by type of skill: technical, management, entrepreneurship, green, other) RCR 99 — SMEs staff completing alternative training for knowledge intensive service activities (KISA) (by type of skills: technical, management, entrepreneurship, green, other) RCR 100 — SMEs staff completing formal training for skills development (by type of skills: technical, management, entrepreneurship, green, other)	Not applicable to the scope of the Plan
2. A greener, low carbon Europe by promoting clean and fair energy transition, green and blue investment, the circular	RCR 26 — Annual final energy consumption (of which: residential, private non-residential, public non-residential) RCR 27 — Households with improved energy performance of their dwellings RCR 28 — Buildings with improved energy classification (of which: residential, private non-residential, public non-residential) RCR 29 — Estimated greenhouse gas emissions RCR 30 — Enterprises with improved energy performance	• Total energy consumption (in total and by economic sectors) • Total final energy consumption (in total and by economic sectors) • Number of buildings with energy performance measures implemented • Energy performance measures implemented in enterprises • Final energy consumption savings achieved

Policy objective	Results of ERDF and CF[270]	Results of the Plan[271]
economy, climate adaptation and risk prevention and management		• Specific heat consumption in buildings • Amount of GHG emissions
	RCR 31 — Total renewable energy produced (of which: electricity, thermal) RCR 32 — Renewable energy: capacity connected to the grid (operational)	• Total renewable energy produced • Share of renewable energy in the total amount of electricity produced • Share of renewable energy in district heating and cooling • Share of renewable energy in transport • Capacity of renewable energy
	RCR 33 — Users connected to smart grids RCR 34 — Roll-out of projects for smart grids	• Users connected to smart grids • Reconstructed and new grids
	RCR 35 — Population benefiting from flood protection measures RCR 36 — Population benefiting from forest fires protection measures RCR 37 — Population benefiting from protection measures against climate related natural disasters (other than floods and forest fires) RCR 96 — Population benefiting from protection measures	Not applicable to the scope of the Plan

Policy objective	Results of ERDF and CF[270]	Results of the Plan[271]
	against non-climate related natural risks and risks related to human activities RCR 38 — Estimated average response time to disaster situations	
	RCR 41 — Population connected to improved water supply RCR 42 — Population connected to at least secondary waste water treatment RCR 43 — Water losses RCR 44 — Waste water properly treated	Not applicable to the scope of the Plan (to be included in policy planning documents for water supply and waste water treatment)
	RCR 46 — Population served by waste recycling facilities and small waste management systems RCR 47 — Waste recycled RCR 48 — Recycled waste used as raw materials RCR 49 — Waste recovered	Not applicable to the scope of the Plan (to be included in policy planning documents for waste management)
	RCR 50 — Population benefiting from measures for air quality RCR 95 — Population having access to new or upgraded green infrastructure in urban areas RCR 51 — Population benefiting from measures for noise reduction RCR 52 — Rehabilitated land used for green areas, social housing, economic or community activities	Not applicable to the scope of the Plan (to be included in the action plan of Latvia for reducing emissions of air pollutants)
3. A more connected Europe by enhancing	RCR 53 — Households with broadband subscriptions to a very high capacity network RCR 54 — Enterprises with broadband subscriptions to a very high capacity network	Not applicable to the scope of the Plan

Policy objective	Results of ERDF and CF[270]	Results of the Plan[271]
mobility and regional ICT connectivity	RCR 55 — Users of newly built, reconstructed or upgraded roads RCR 56 — Time savings due to improved road infrastructure RCR 101 — Time savings due to improved rail infrastructure	• Length of newly built, reconstructed or upgraded roads
	RCR 57 — Length of European Rail Traffic Management System equipped railways in operation RCR 58 — Annual number of passengers on supported railways RCR 59 — Freight transport on rail RCR 60 — Freight transport on inland waterways	• Number of railway passengers • Number of shipments by rail
	RCR 62 — Annual passengers of public transport RCR 64 — Annual users of dedicated cycling infrastructure	• Number of passengers carried by environmentally friendly public transport
4. A more social Europe by implementing the European pillar of social rights	RCR 65 — Job seekers using annually the services of the employment services supported	Not applicable to the scope of the Plan
	RCR 66 — Occupancy of temporary reception infrastructure built or renovated RCR 67 — Occupancy of rehabilitated housing — migrants, refugees and persons under or applying for international protection RCR 68 — Occupancy of rehabilitated housing — other	Not applicable to the scope of the Plan
	RCR 70 — Annual number of children using childcare infrastructure supported RCR 71 — Annual number of students using education infrastructure supported	Not applicable to the scope of the Plan

Policy objective	Results of ERDF and CF[270]	Results of the Plan[271]
	RCR 72 — People with access to improved health care services RCR 73 — Annual number of persons using the health care facilities supported RCR 74 — Annual number of persons using the social care facilities supported RCR 75 — Average response time for medical emergencies in the area supported	Not applicable to the scope of the Plan

Table 2. Thematic enabling conditions for the ERDF, ESF+, and the Cohesion Fund

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
1. A smarter Europe by promoting innovative and smart economic transformation	ERDF All specific objectives under this policy objective	Good governance of national or regional smart specialisation strategy	Smart specialisation strategy(ies) shall be supported by: 1. Up-to-date analysis of bottlenecks for innovation diffusion, including digitalisation 2. Existence of a competent regional/national institution or body responsible for the management of the smart specialisation strategy 3. Monitoring and evaluation tools to measure performance towards the objectives of the strategy 4. Effective functioning of entrepreneurial discovery process 5. Actions necessary to improve national or regional research and innovation systems 6. Actions to manage industrial transition 7. Measures for international collaboration	Innovation, research, and decarbonisation dimension of the Plan (Sections 2.5, 3.5, and 4.6 of the Plan)
2. A greener, low carbon Europe by promoting clean and fair energy transition, green and blue	ERDF and Cohesion Fund. 2.1. Promoting energy efficiency measures	Strategic policy framework to support energy efficiency renovation of residential and non-residential buildings	1. A national long term renovation strategy to support renovation of the national stock of residential and non-residential buildings is adopted, in line with the requirements of the Directive 2010/31/EU on energy performance of buildings, which: a. Entails indicative milestones for 2030	Energy efficiency dimension of the Plan (Sections 2.2 and 3.2 of the Plan)

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
investment, the circular economy, climate adaptation and risk prevention and management			and 2040 and targets for 2050 b. Provides an indicative outline of budgetary resources to support the implementation of the strategy c. Defines effective mechanisms for promoting investments in building renovation 2. Energy efficiency improvement measures to achieve required energy savings	
	ERDF and Cohesion Fund. 2.1. Promoting energy efficiency measures 2.2. Promoting renewable energy through investment in generation capacity	Governance of the energy sector	National Energy and Climate Plan is adopted and includes: 1. All elements required by the template in Annex I of the Regulation on Governance of the Energy Union[273] 2. An indicative outline of envisaged financing resources and mechanisms for measures promoting low carbon energy	Approval of the Plan by the Cabinet of Ministers is expected to take place in the fourth quarter of 2019
	ERDF and Cohesion Fund. 2.2. Promoting renewable energy through investment in generation capacity	Effective promotion of the use of renewable energy across sectors and across the EU	Measures are in place which ensure: 1. Compliance with the binding national renewable energy target for 2020 and with this baseline by 2030 in accordance with the recast Directive 2009/28/EC[274] 2. An increase in the share of renewable energy in the heating and cooling sector	Decarbonisation strategy included in the Plan (Sections 2.1, 3.1, and 4.2 of the Plan)

[273] OJ [not approved yet].
[274] OJ [not approved yet].

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
			by 1 percentage point per year by 2030	
	ERDF and Cohesion Fund. 2.4. Promoting adaptation to climate change, risk prevention, and resilience to disasters	Effective disaster risk management framework	A national or regional disaster risk management plan consistent with the existing climate adaptation strategies is in place and includes: 1. A description of key risks, assessed in accordance with the provisions of Article 6(a) of Decision No 1313/2013/EU, reflecting current and long term threats (25–35 years). The assessment shall build, for climate related risks, on climate change projections and scenarios 2. Description of the disaster prevention, preparedness and response measures to address the key risks identified. The measures shall be prioritised in proportion to the risks and their economic impact, capacity gaps[275], effectiveness and efficiency, taking into account possible alternatives 3. Information on budgetary and financing resources and mechanisms available for covering the operation and maintenance costs related to prevention, preparedness and response	Not applicable to the scope of the Plan

[275] According to the assessment of risk management capacity in line with Article 6(c) of Decision No 1313/2013/EU.

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	ERDF and Cohesion Fund. 2.5. Promoting water efficiency	Updated planning for required investments in water and waste water sectors	A national investment plan is in place and includes: 1. An assessment of the current state of implementation of the Urban Waste Water Treatment Directive (UWWTD) 91/271/EEC and of the Drinking Water Directive (DWD) 98/83/EC 2. The identification and planning of any public investments, including an indicative financial estimation: a. Required to achieve compliance with the UWWTD, including a prioritization with regard to the size of agglomerations and the environmental impact, with investments broken down for each waste water agglomeration b. Required to implement the DWD (Directive on drinking water 98/83/EC) c. Required to match the needs stemming from the proposed recast (COM(2017)753 final), regarding in particular the revised quality parameters detailed in Annex I 3. An estimate of investments needed to renew existing waste water and water supply infrastructure, including	Not applicable to the scope of the Plan (to be included in policy planning documents for water supply and waste water treatment)

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
			networks, based on their age and depreciation plans 4. An indication of potential sources of public financing, when needed to complement user charges	
	ERDF and Cohesion Fund. 2.6. Developing the (transition to) circular economy, through investment in the waste sector and resource efficiency	Updated waste management plan	Waste management plan(s) are in place in accordance with Article 28 of Directive 2008/98/EC as amended by Directive EU 2018/xxxx and covering the entire territory of the Member State and include: 1. An analysis of the current waste management situation in the geographical entity concerned, including the type, quantity and source of waste generated and an evaluation of their future development taking into account the expected impacts of measures set out in the Waste Prevention Programme(s) developed in accordance with Article 29 of Directive 2008/98/EC as amended by Directive 2018/xx/EU 2. An assessment of existing waste collection schemes, including the material and territorial coverage of separate collection and measures to improve its operation, as well as the need for new collection schemes	Not applicable to the scope of the Plan (to be included in policy planning documents for waste management)

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
			3. An investment gap assessment justifying the need for additional or upgraded waste infrastructure, with an information of the sources of revenues available to meet operation and maintenance costs 4. Information on the location criteria for site identification and on the capacity of future waste treatment installations	
	ERDF and Cohesion Fund. 2.6. Promoting green infrastructure in the urban environment and reducing pollution	Priority action framework for the necessary conservation measures involving Union co-financing	A priority action framework pursuant to Article 8 of Directive 92/43/EEC is in place and includes: 1. All elements required by the template for the priority action framework for 2021-2027 agreed by the Commission and the Member States 2. The identification of the priority measures and an estimate of financing needs	Not applicable to the scope of the Plan
3. A more connected Europe by	ERDF 3.1. Enhancing digital connectivity	National or regional broadband plan	A national or regional broadband plan is in place which includes: 1. An assessment of the investment gap	Not applicable to the scope of the Plan

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
enhancing mobility and regional ICT connectivity			that needs to be addressed to reach the EU Gigabit connectivity objectives[276] based on: o a recent mapping[277] of existing private and public infrastructure and quality of service using standard broadband mapping indicators o consultation on planned investments 2. The justification of planned public intervention on the basis of sustainable investment models that: o enhance affordability and access to open, quality and future-proof infrastructure and services o adjust the forms of financial assistance to the market failures identified o allow for a complementary use of different forms of financing from EU, national or regional sources 3. Measures to support demand and use of Very High Capacity (VHC) networks, including actions to facilitate their roll-	

[276] According to the European Commission Communication *Towards a European Gigabit Society*, COM(2016)587, https://ec.europa.eu/digital-single-market/en/policies/improving-connectivity-and-access.

[277] According to Article 22 of (Proposal for a) Directive of the European Parliament and of the Council establishing the European Electronic Communications Code.

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
			out, in particular through the effective implementation of the EU Broadband Cost-Reduction Directive[278] 4. Technical assistance mechanisms, including Broadband Competence Offices to reinforce the capacity of local stakeholders and advise project promoters 5. Monitoring mechanisms based on standard broadband mapping indicators	
	ERDF and Cohesion Fund. 3.2. Developing a sustainable, climate resilient, intelligent, secure and intermodal TEN-T	Comprehensive transport planning at the appropriate level	Multimodal mapping of existing and planned infrastructures until 2030 is in place which: 1. Includes economic justification of the planned investments, underpinned by robust demand analysis and traffic modelling, which should take into account the anticipated impact of rail liberalisation 2. Reflects air quality plans, taking into	Decarbonisation and energy efficiency dimensions of the Plan Detailed measures and their assessment are to be included in transport development policy planning documents

[278] Directive 2014/61/EU.

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	3.3. Developing a sustainable, climate resilient, intelligent and intermodal national, regional and local mobility, including improved access to TEN-T and cross-border mobility		account in particular national decarbonisation plans 3. Includes investments in core TEN-T network corridors, as defined by Regulation (EU) 1316/2013, in line with the respective TEN-T work plans 4. For investments outside the core TEN-T, ensures complementarity by providing sufficient connectivity of the regions and local communities to the core TEN-T and its nodes 5. Ensures interoperability of the railway network, through the deployment of baseline-3 compliant ERTMS covering at least the European Deployment Plan 6. Promotes multimodality, identifying needs for multimodal or transhipment freight and passengers terminals and active modes 7. Includes measures aiming at promoting alternative fuels, in line with the relevant national policy frameworks 8. Includes assessment of road safety risks in line with existing national road safety strategies, together with a mapping of the affected roads and sections and providing with a prioritisation of the corresponding investments	

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
			9. Provides information on budgetary and financing resources corresponding to the planned investments and required to cover operation and maintenance costs of the existing and planned infrastructures	
4. A more social Europe by implementing the European pillar of social rights	ERDF 4.1. Enhancing the effectiveness of labour markets and access to quality employment trough developing infrastructure ESF 4.1.1. Improving access to employment of all jobseekers, including youth and inactive people, and promoting self-employment and the social economy	Strategic policy framework for active labour market policies	A strategic policy framework for active labour market policies in the light of employment guidelines is in place and includes: 1. Arrangements for conducting jobseeker profiling and assessment of their needs, including for entrepreneurial pathways 2. Information on job vacancies and employment opportunities taking into account the needs of the labour market 3. Arrangements for ensuring that its design, implementation, monitoring and review is conducted in close cooperation with relevant stakeholders 4. Arrangements for monitoring, evaluation and review of active labour	Not applicable to the scope of the Plan

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	4.1.2. Modernising labour market institutions and services to ensure timely and tailor-made assistance and support to labour market matching, transitions and mobility		market policies 5. For youth employment interventions, evidence-based and targeted pathways towards young people not in employment, education or training including outreach measures and based on quality requirements taking into account criteria for quality apprenticeships and traineeships, including in the context of implementing Youth Guarantee schemes	
	ERDF 4.1. Enhancing the effectiveness of labour markets and access to quality employment trough developing infrastructure ESF 4.1.3. Promoting a better work/life balance including access to childcare, a healthy and well-adapted working environment	National strategic framework for gender equality	A national strategic policy framework for gender equality is in place that includes: 1. Evidence-based identification of challenges to gender equality 2. Measures to address gender gaps in employment, pay and pensions, and promote work-life balance, including through improving access to early childhood education and care, with targets 3. Arrangements for monitoring, evaluation and review of the strategic policy framework and data collection methods 4. Arrangements for ensuring that its design, implementation, monitoring and	Not applicable to the scope of the Plan

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	addressing health risks, adaptation of workers to change and healthy and active ageing		review is conducted in close cooperation with equality bodies, social partners and relevant civil society organisations	
	ERDF 4.2. Improving access to inclusive and quality services in education, training and lifelong learning through developing infrastructure ESF 4.2.1. Improving the quality, effectiveness and labour market relevance of education and training systems 4.2.2. Promoting flexible upskilling and reskilling opportunities for all, including by facilitating career transitions and promoting professional mobility 4.2.3. Promoting equal	Strategic policy framework for the education and training system at all levels	A national and/or regional strategic policy framework for the education and training system is in place and includes: 1. Evidence-based systems for skills anticipation and forecasting as well as graduate tracking mechanisms and services for quality and effective guidance for learners of all ages 2. Measures to ensure equal access to, participation in and completion of quality, relevant and inclusive education and training and acquisition of key competences at all levels, including higher education 3. Coordination mechanism across all levels of education and training, including tertiary education, and clear assignment of responsibilities between the relevant national and/or regional bodies 4. Arrangements for monitoring, evaluation and review of the strategic policy framework 5. Measures to target low-skilled, low-	Not applicable to the scope of the Plan

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	access, in particular for disadvantaged groups, to quality and inclusive education and training, from early childhood education and care through general and vocational education and training and to tertiary level		qualified adults and those with disadvantaged socio-economic backgrounds and upskilling pathways 6. Measures to support teachers, trainers and academic staff as regards appropriate learning methods, assessment and validation of key competences 7. Measures to promote mobility of learners and staff and transnational collaboration of education and training providers, including through recognition of learning outcomes and qualifications	
	ERDF 4.3. Increasing the socioeconomic integration of marginalised communities, migrants and disadvantaged groups through integrated measures, including housing and social services ESF 4.3.1. Promoting active inclusion, including with a view to promoting equal	National strategic policy framework for social inclusion and poverty reduction	A national strategic policy framework for social inclusion and poverty reduction is in place that includes: 1. Evidence-based conclusions regarding poverty and social exclusion, including child poverty, homelessness, spatial and educational segregation, limited access to essential services and infrastructure, and the specific needs of vulnerable people 2. Measures to prevent and combat segregation in all fields, including through providing adequate income support, inclusive labour markets and access to quality services for vulnerable people, including migrants	Conditions for reducing energy poverty included in the plan

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	opportunities and active participation, and improving employability		3. Measures for the transition from institutional to community-based care 4. Arrangements for ensuring that its design, implementation, monitoring and review is conducted in close cooperation with social partners and relevant civil society organisations	
	ESF 4.3.2. Promoting socio-economic integration of marginalised communities such as the Roma	National Roma Integration Strategy	The National Roma Integration Strategy (NRIS) is in place that includes: 1. Measures to accelerate Roma integration, prevent and eliminate segregation, taking into account the gender dimension and situation of young Roma, and setting key requirements and measurable milestones and targets 2. Arrangements for monitoring, evaluation and review of the Roma integration measures 3. Arrangements for the mainstreaming of Roma inclusion at regional and local level 4. Arrangements for ensuring that its design, implementation, monitoring and review is conducted in a close cooperation with the Roma civil society and all other relevant stakeholders, including at the regional and local level	Not applicable to the scope of the Plan
	ERDF	Strategic policy	A national or regional strategic policy	Not applicable to the scope of

Policy objective	Specific objective	Name of the enabling condition	Fulfilment criteria for the enabling condition	Connection of the enabling condition with the Plan, its assessment in the Plan
	4.4. Ensuring equal access to health care through developing infrastructure, including primary care ESF 4.3.4. Enhancing the equal and timely access to quality, sustainable and affordable services Improving accessibility, effectiveness and resilience of healthcare systems Improving access to long-term care services	framework for health	framework for health is in place that contains: 1. Mapping of health and long-term care needs, including in terms of medical staff, to ensure sustainable and coordinated measures 2. Measures to ensure the efficiency, sustainability, accessibility and affordability of health and long-term care services, including specific focus on individuals excluded from health and long-term care systems 3. Measures to promote community based services, including prevention and primary care, home-care and community-based services	the Plan

Annex 3

Main policies and implementation measures of the baseline scenario for projections prepared for the period until 2050[279]

Policy	Policy measure	Performance indicator
Energy Efficiency Law	Obligation to carry out an energy audit for large enterprises and large electricity consumers	Energy savings, GWh
Cabinet Regulation No. 383 of 9 July 2013 "Regulations Regarding Energy Certification of Buildings"	Minimum permissible level of energy performance of buildings for buildings to be reconstructed or renovated	Energy savings, GWh
Law On Management of European Union Structural Funds and the Cohesion Fund for the 2014–2020 Programming Period **Conception on Incorporating the Provisions 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 into National Law** **Plan for Alternative Energy Efficiency Policy Measures for Reaching the Final Energy Consumption Savings Target for**	Implementation of the specific measure 4.2.1.1 "To promote the increase of energy efficiency in residential buildings" of the specific support objective 4.2.1 "To promote the increase of energy efficiency in public and residential buildings" of the Operational Programme "Growth and Employment"	Energy savings, GWh
	Implementation of the measure 4.2.1.2 "To promote the increase of energy efficiency in public buildings" of the specific 4.2.1 "To promote the increase of energy efficiency in public and residential buildings" of the Operational Programme "Growth and Employment"	Energy savings, GWh
	Implementation of the specific support objective 4.2.2 "To facilitate the increase of energy efficiency and use of RES in municipal buildings in accordance with the integrated development programmes of local	Energy savings, GWh RES installed, MW

[279] This Annex includes measures that are implemented now or that are provided for in the policy planning documents or legislation of Latvia

Policy	Policy measure	Performance indicator
2014–2020	governments" of the Operational Programme "Growth and Employment"	
	Implementation of the specific support objective 4.1.1 "To promote efficient use of energy sources, reduction of energy consumption, and transition to renewable energy in the manufacturing industry" of the Operational Programme "Growth and Employment"	Energy savings, GWh RES installed, MW
	Support to food processing undertakings under the sub-measure "Support to investments in processing" of the Rural Development Programme 2014–2020 in the 2014–2020 programming period for EU funds	Energy savings, GWh
	Plan for Alternative Energy Efficiency Policy Measures with reported and planned measures	Energy savings, GWh (see the Plan for Alternative Measures in Energy Efficiency Policy for Reaching the Final Energy Consumption Savings Target for 2014–2020, Table 1 and Table 2)
	Optional agreement on improving energy efficiency	Energy savings, GWh
	Energy Efficiency Obligation Scheme	Energy savings, GWh
	Energy efficiency measures funded by local governments	Energy savings, GWh[280]
	Programmes of EU funds for increasing the energy performance of residential and municipal buildings are continued at least in the same intensity in the	Energy savings, GWh

[280] Plan for Alternative Energy Efficiency Policy Measures for Reaching the Final Energy Consumption Savings Target for 2014–2020, Annex 1

Policy	Policy measure	Performance indicator
	following periods	
Renewable energy support policy	Complex measures for lifting the MPC and developing the electricity market	Reduction and abolishment of subsidies (MEUR/year)
Law On Management of European Union Structural Funds and the Cohesion Fund for the 2014–2020 Programming Period	Organisation of the second project submission round of the specific support objective 4.3.1 "To promote energy efficiency and use of local RES in district heating" of the Operational Programme "Growth and Employment"	RES heat production capacity installed Reconstructed heating networks, km
Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles (and its amendments (COM(2017) 653))	Public procurement and green public procurement	
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 sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (and its review)	Mandatory admixture of biofuels	Share of biofuels in fuel consumption in transport/road transport
Alternative Fuels Development Plan 2017–2020	Establishment of the network of EV charging stations Implementation of the specific support objective 4.4.1 "To develop EV charging infrastructure in Latvia" of the Operational Programme "Growth and Employment"	Number of EV charging stations built (DC fast charging stations with a capacity of at least 50 kW) — 150.

Policy	Policy measure	Performance indicator
	Development of environmentally friendly public transport. Implementation of the measure 4.5.1.2 “To develop environmentally friendly public transport infrastructure (for buses)” of the specific support objective 4.5.1 “To develop environmentally friendly public transport infrastructure” of the Operational Programme “Growth and Employment”	By 31 December 2023: 50 new and rebuilt environmentally friendly public buses
TDG2020 **Law On Management of European Union Structural Funds and the Cohesion Fund for the 2014–2020 Programming Period**	Implementation of the measure 6.2.1.1 “Electrification of the Latvian railway network” of the specific support objective 6.2.1 “To ensure a competitive and environmentally-friendly TEN-T railway network by promoting its safety, quality and capacity” in the priority direction of Sustainable Transport System of the Operational Programme “Growth and Employment”	Total length of electrified railway lines through reconstruction or modernisation, (ii) reduction of CO_2 emissions in railway transport
TDG2020 **Law On Management of European Union Structural Funds and the Cohesion Fund for the 2014–2020 Programming Period**	Implementation of the measure 4.5.1.1 “To develop environmentally friendly public transport infrastructure (for railway transport)” of the specific support objective 4.5.1 “To develop environmentally friendly public transport infrastructure” of the Operational Programme “Growth and Employment”	
Directive 2009/28/EC of the European Parliament and of the Council of	Mandatory target for renewable energy (14 %) in fuel used in transport by 2030	Share of RES in fuels used for transport, calculated according to the

Policy	Policy measure	Performance indicator
23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (and its review)		methodology of the Directive.
Cabinet Regulation No. 295 of 30 May 2017 "Regulations Regarding the National Technical Roadworthiness Test and Technical Control on the Roads"	Systematic provision of the national technical roadworthiness test and technical control on the roads to ensure that only cars that are technically roadworthy and comply with environmental requirements are participating in road traffic.	
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 sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (and its review) **Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC**	Fuel suppliers shall ensure by 31 December 2020 that GHG emissions of the transport energy (excluding electric energy) life cycle per one unit of energy is decreased by at least 6 % compared to 2010	
Tax policy in transport	Excise duty for petroleum products and natural gas	
	Vehicle operation tax	
	Exemption from electricity tax. According to the Electricity Tax Law, electricity used for the carriage of goods and public carriage of passengers, including on rail transport and in public carriage of passengers	

Policy	Policy measure	Performance indicator
	in towns, shall be exempt from tax.	
Reduction of GHG emissions from waste management	Increasing the number of inhabitants connected to the central sewage system and waste water treatment facilities in certain agglomerations. This measure has to be implemented by 31 December 2023.	
	Developing and improving the quality of water supply and sewage system and providing possibilities to connect to it.	
	Promoting reuse, recycling and recovery of different types of waste. Increase of the amount of composted industrial waste according to the approved investments; considering that the Waste Framework Directive (2008/98/EC) includes new targets regarding food waste and textile waste, it is planned to develop recycling of these types of waste as well as recycling of plastic, paper, and metal.	
	Fulfilment of the requirements of Directive 1999/31/EC[281] regarding the disposal of biodegradable waste — two projects are currently being implemented in the area of recycling biodegradable waste: • the planned recycling capacity of Krizevņiki landfill in Rēzekne is 8,000 t/year • the planned recycling capacity of Getliņi landfill is 100,000 t/year	
	Reduction of disposed waste to 10 % in 2035	
Policy for reducing emissions from	Directive 2010/75/EU of the European Parliament	

[281] Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste

Policy	Policy measure	Performance indicator
industrial processes and use of chemical substances	and of the Council of 24 November 2010 concerning industrial emissions (integrated pollution prevention and control).	
	Law On Pollution resulting in the implementation of the best available techniques (BAT): the best available emerging techniques so far have been taken from the following sectors: cement manufacturing, iron and steel industry, glass fibre manufacturing, leather tanning, chlor-alkali industry, pulp and paper manufacturing, refining of mineral oil and gas, manufacturing of wood sheets, production of non-ferrous metals, intensive rearing of poultry and pigs, large combustion plants, large-scale production of chemical substances, waste management.	
	Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006(F-Gas Regulation)	The amount of hydrofluorocarbons placed on the EU market may not exceed the amount specified in Annex 5 of the Regulation, i.e. 100 % in 2015, 21 % in 2030. Allowances for placing F-gases on the market are issued to producers and importers.
	Directive 2006/40/EC of the European Parliament and of the Council of 17 May 2006 relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EEC (MAC Directive). Cabinet Regulation No. 1494 of 22 December 2009 “Rules on the Conformity Assessment of Mopeds, Motor Vehicles, their Trailers and Components”.	

Policy	Policy measure	Performance indicator
	The Law On Pollution provides for a procedure for limiting emissions of volatile organic compounds from installations in which organic solvents are used. This Law contains legal norms arising from: • Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (recast) (text with EEA relevance); • Directive 2004/42/CE of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC.	Establishing the maximum content of VOCs in certain products — paints, varnishes and vehicle refinishing products. These products have to be labelled accordingly. The maximum content had to be decreased in two stages: the content of VOCs in the respective products has to be even lower from 2007 and 2010.
	Cabinet Regulation No. 186 “Procedure for Limiting Emissions of Volatile Organic Compounds from Installations in which Organic Solvents are Used”, which provides for emission limits to be observed for specific activities (24 types) in which a certain amount of organic solvents is used. The State Environmental Service monitors these activities and emissions.	
	Cabinet Regulation No. 736 of 12 December 2017	

Policy	Policy measure	Performance indicator
	(protocol No. 61 37.§) “Procedure for Preventing, Limiting and Controlling Emissions of Air Pollutants from Combustion Plants”, which aims to reduce the negative impact of air pollution on human health and environment by developing a common legal framework for reducing the amount of pollution from all combustion plants (technical apparatus in which fuels are oxidised in order to generate energy for further use) and creating an appropriate control mechanism. The draft Regulation provides for stricter requirements for emissions of air pollutants for medium-power combustion plants (1–50 MW) and requirements for monitoring the operation of such plants.	
Policy for promoting the reduction of GHG emissions and CO_2 sequestration in LULUCF activities	Reconstruction and restoration of amelioration systems in cropland	
	Support for introduction and promotion of integrated horticulture	
	Maintenance of biodiversity in grasslands	
	Cultivation of legumes	
	Reconstruction of amelioration systems in forest lands	
	Afforestation in 2014–2020	
	Afforestation in 2007–2013	
	Increasing resilience of forest ecosystems and their ecological value	
	Restoration of forest stands destroyed as a result of	

Policy	Policy measure	Performance indicator
	natural disasters	
	Establishment of new orchards	
	Reconstruction and restoration of amelioration systems in cropland	
	Undersowing in winter crops	
	Introduction of cultivation of legumes in the conventional crop rotation	
	Green fallow before winter crops	
	Restoration of forest stands destroyed as a result of natural disasters	
	Coppice cultivation thinning	
	Reconstruction of amelioration systems in forest lands	
	Afforestation and improvement of the quality of forest stands in naturally afforested lands	

Overview of the identified potential new measures and measures under discussion for reaching the objectives laid down in the Plan[282]

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
1. Policy for using RES in electricity production *decarbonisation; energy efficiency; energy security*				
1.1. Additional activities of the EU funding 1.1.1. Implementation of joint projects for introducing off-shore wind energy (in cooperation with Lithuania/Estonia) 1.1.2. Installation of biogas refinement facilities (for producing biomethane)	MoE	*tbc* *EU funds, including Connecting Europe Facility*		
1.2. Tax policy measures 1.2.1. Assessment of the possibilities of reducing tax burden, e.g. property tax (hereinafter — PT), personal income tax (hereinafter — PIT) and value added tax (hereinafter — VAT), on households for purchasing and installing solar panels	MoE, MoEPRD	*tbc* *state budget,* *municipal budget*		
1.3. Changes in legislation 1.3.1. Reviewing Cabinet Regulation No. 240 of	MoE, MoEPRD(	*Not envisaged*		

[282] **Impact assessment of the measures specified in this table is still continuing (discussion about these measures will continue in 2019), therefore measures in this table are indicative. The information included in the table may be updated.**

[283] With regard to measures that require state funding, requests for additional funding from the state budget are assessed in the process of preparing and reviewing annual and medium term state budget framework draft laws according to the financial capacities of the state budget.

[284] Funding for complete implementation of the measure or within the period covered by the Plan.

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
30 April 2013 "General Regulations for the Planning, Use and Building of the Territory" by aligning the territorial restrictions for establishing wind parks with the general EU framework 1.3.2. Development of the legal framework that would allow several producers of RE that use it themselves to work together to produce, consume, store, and sell electricity 1.3.3. Development of the legal framework for promoting the establishment of a RE community	local governments)			
1.4. Promotion measures 1.4.1. Long-term lease agreement for wind parks based on a procurement (with the total capacity of up to 500 MW) in state forests and adjacent territories 1.4.2. Support for broader implementation of the net payment system by also applying Section 30^1 of the Electricity Market Law to legal entities 1.4.3. Support for broader implementation of wind (on-shore) and solar energy technologies 1.4.4. Establishment of a single point of contact for issuing permits for introducing RE technologies 1.4.5. Research of RES in the territorial waters of Latvia, including research of establishing infrastructure 1.4.6. Cooperation between scientists and entrepreneurs in the area of RES	MoE	*tbc* *EU funds, including Connecting Europe Facility*		
1.5. Obligations 1.5.1. Mandatory share of biogas (biomethane) admixture in	MoE	*Not envisaged*		

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
electricity production (obligation)				
2. Policy for using RES in DH, LH and individual heating and cooling (including industry, services and household sector) *decarbonisation; energy efficiency; energy security*				
2.1. Implementation of the current support programmes of EU funds in the current intensity[285]	Sectoral ministries	EUR 150 million *EU funds,* *climate funding (EAAI, Modernisation Fund)* *state budget* *municipal budget*	Indicative indicators: 1) Additional power generated from RES 2) Modernisation of heat generation capacities using RES in DH and LH 3) Modernisation of cold generation capacities using RES in district and local cooling 4) Estimated annual reduction of greenhouse gas emissions	Share of RES in the total final energy consumption as a result of implementing these funds reaches 41.3 % by 2030. Share of RES in district heating increases by about 0.8–1.0 percentage points per year in the period from 2020 to 2030 and reaches 57.6 % in 2030.
2.2. Implementation of the current support programmes of EU funds in higher intensity				
2.3. Additional activities of new support programmes of EU funds 2.3.1. 30 % more zero-emission RES facilities (sun, wind, heat pumps, cold pumps) or biomass combustion plants installed in DH and LH considering the obligation to meet air quality regulations and conditions 2.3.2. Compulsory fitting of solar collectors on buildings[286] that are insulated (a condition for receiving funding) 2.3.3. Transition to electricity as a heating source in LH 2.3.4. Introduction of RE technologies in cooling, especially in public buildings 2.3.5. Adaptation of the existing heating infrastructure for providing cooling in buildings 2.3.6. Renovation of a small number of groups of buildings[287], including transition to RES in preparing hot water and heating				

[285] The measure is already included in the baseline scenario (see Annex 3)
[286] Multi-apartment buildings connected to DH and LH and using fossil fuels as well as private houses

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
2.3.7. Introduction of RE technologies in single-family and two-family dwellings by supporting at least 1,000 households 2.3.8. Support for installing biomethane production (biogas refinement) facilities 2.3.9. Cooperation between scientists and entrepreneurs in the area of RES				
2.4. Tax policy measures 2.4.1. Assessment of the possibilities of reducing tax burden, e.g. PT, PIT and VAT, on households for purchasing and installing solar collectors, heat pumps and cold pumps	MoF, MoEPRD(local governments)	*tbc* *State budget, municipal budget*		
2.5. Obligations 2.5.1. Mandatory share of biogas (biomethane) admixture in natural gas used for heat production (obligation)	MoE	*Not envisaged*		
3. Policy for improving energy efficiency in DH, LH and individual heating and cooling, and buildings(including industry, services and household sector) *decarbonisation; energy efficiency; energy security*				
3.1. Implementation of the current support programmes of EU funds in the current intensity[288]	Sectoral ministries	EUR 660 million *EU funds,* *climate funding (EAAI, Modernisation Fund)*	Indicative indicators: 1) Number of households with improved energy consumption	Energy efficiency measures reduce the total costs of the system by 0.1 % of GDP. Average net energy
3.2. Implementation of the current support programmes of EU funds in higher intensity 3.2.1. Renovated floor area increased by 30 % (it is desirable to ensure that 2 million m^2 are renovated over the entire				

[287] Both multi-apartment buildings and private houses
[288] The measure is already included in the baseline scenario (see Annex 3)

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
period) 3.2.2. Net heat consumption in buildings reduced by 30 % (it is desirable to reach <100 kWh/m^2 per year 3.2.3. Increasing energy performance of buildings owned by the state by at least 3 % of the total energy-inefficient area owned by the state each year		*state budget* *municipal budget*	classification 2) Average heat consumption for heating in multi-apartment buildings after implementing energy efficiency measures 3) Decrease of annual primary energy consumption of public buildings 4) Energy savings of economic operators representing the industrial sector that have received support 5) Reconstructed heating networks 6) Reduction of thermal energy losses in reconstructed	consumption for heating in residential buildings is reduced by 21.5 % in 2030 in comparison with to the current level About 25 % of residential buildings are renovated
3.3. Activities of new support programmes of EU funds 3.3.1. Measures for improving energy performance of buildings included in the energy savings list implemented in at least 1,000 private houses 3.3.2. Renovation of a small number of groups of buildings, including renovation of a group of buildings by reducing the amount of thermal energy consumed (by giving preference in installing heating systems to equipment that corresponds to emission and efficiency requirements laid down in Regulation 2015/1189[289] that will enter into force in 2022) 3.3.3. Modernisation of the existing DH and LH capacities and transition to RE and electricity as a source of thermal energy (electric heating) 3.3.4. Reconstruction of DH and LH network by reducing losses (in medium sized towns that still have potential), introduction of energy efficient cooling in public and private buildings (ground source cold pumps, use of water from large water bodies, adaptation of the existing DH and LH				

[289] Commission Regulation (EU) 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
infrastructure for cooling in buildings) 3.3.5. Modernisation of the existing production capacities by installing more energy efficient equipment for production and processes related to production 3.3.6. Organisation of production buildings and areas, including replacement of internal and external engineering networks and engineering systems in the production area with more energy efficient ones 3.3.7. Support for optional agreements (financing from the Energy Efficiency Fund)			heating networks 7) Estimated annual reduction of greenhouse gas emissions	
3.4. Tax policy measures 3.4.1. Increase of natural resources tax (NRT) for CO_2 by 20–40 EUR/CO_2 for all fossil fuels and all NRT payers — permit for performing category A or B polluting activity (>5MW) 3.4.2. Application of NRT to CO_2 (at 50 %) for combustion plants from 0.2 MW to 5 MW 3.4.3. Abolishing the exemption from NRT to CO_2 for peat 3.4.4. Application of NRT to CO_2 (at 50 %) for stationary heating plants in buildings that technically can be connected to DH 3.4.5. Increasing the excise duty for fossil fuels by 20 % 3.4.6. Improvement of the accounting system for NRT and excise duty 3.4.7. Assessment of the possibilities of reducing tax burden, e.g. PT, PIT and VAT, on households for implementing energy efficiency measures	MoF, MoEPRD(local governments)	*tbc* *state budget* *municipal budget*		Taxes have an impact on final energy consumption. Increasing the NRT for CO_2 and excise duty by 20 % ensures final energy savings by about 7.8 PJ by 2030, while increasing the NRT for CO_2 and excise duty by 40 % ensures final energy savings by about 8 PJ by 2030. This corresponds to 5.2 % and 5.4 % respectively in relation to the total consumption in the

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
3.4.8. Additional increase of NRT for CO_2 for newly installed natural gas boilers using fossil fuels for DH/LH if they are installed for providing backup and peak capacity				baseline scenario. Application of taxes reduces final energy consumption and thus total costs of the energy system. Total costs of the system in the period from 2020 to 2035 are about 0.28 % lower than in the baseline scenario.
3.5. Changes in legislation 3.5.1. Review of construction standards[290] 3.5.1.1. Energy performance requirements for new buildings — nearly zero-energy consumption buildings 3.5.1.2. Energy efficiency requirements for engineering systems in buildings 3.5.1.3. Increasing the minimum level of energy performance for new buildings 3.5.1.4. Increasing minimum requirements for the thermotechnics of building envelopes 3.5.1.5. Improving the availability of information about building renovation and reporting about the measures performed 3.5.1.6. Imposing obligations for maintaining and improving residential areas (engineering systems) 3.5.1.7. Laying down requirements for establishing charging		*Not envisaged*		

[290] The measure is already included in the baseline scenario (see Annex 3)

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
points in the conditions regarding energy performance of buildings 3.5.2. Changing the regulatory framework for LH equipment >0.2 MW by applying equivalent environmental protection and air quality requirements 3.5.3. Development and implementation of conditions for liberalising the heating system (market)				
3.6. Promotion measures 3.6.1. A grant for private house renovation with especially facilitating application mechanisms (on a first-come, first-served basis) on-line based on supporting documentation on expenses 3.6.2. Establishment and implementation of a comprehensive monitoring and accounting system of energy efficiency measures	MoE			
3.7. Obligations 3.7.1. Mandatory requirements for new buildings corresponding to class B energy efficiency indicator	MoE	*Not envisaged*		
4. Expansion of EEOS and mandatory introduction of energy management for other large energy consumers as well *decarbonisation; energy efficiency; energy poverty*				
4.1. The scope of EEOS also includes the following: **Option 1** • The obligated parties to the EEOS are all the energy traders who collectively supply 90 % of the total amount of energy supplied to the consumers in Latvia.	MoE	*Not envisaged*		

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
• The amount of energy sold by the party to the voluntary agreement is excluded from the amount of energy supplied to consumers. • The obligation is calculated based on the amount of energy sold. Large consumers and large enterprises are not excluded. **Option 2** • electricity traders with the annual amount of electricity sold of 10 GWh; • gas traders with the amount of natural gas supplied to final consumers exceeding 1,000 GWh/year; • transport fuel traders with the amount of fuel (fossil fuels and biofuels) supplied exceeding 40,000 m3; • traders of thermal energy with at least one facility with a thermal input of 20 MW connected to their system and the amount of heat supplied exceeding 20 GWh/year.				
5. Policy for using RES and increasing energy efficiency in transport *decarbonisation; energy efficiency; energy security*				
5.1. Implementation of the current support programmes of EU funds in the current and higher intensity 5.1.1. Developing EV charging infrastructure in Latvia[291] 5.1.2. Establishing a competitive and environmentally friendly TEN-T railway network by promoting its security, quality and	MoT	EUR 400 million *EU funds,* *climate funding (EAAI, Modernisation Fund)*	Number of EV charging stations built (DC fast charging stations with a capacity of at least 50 kW) —	

[291] The measure is already included in the baseline scenario (see Annex 3)

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
capacity[292] 5.1.3. Developing environmentally friendly public transport infrastructure in development centres of national significance with a tramway network (in Rīga, Daugavpils, Liepāja)[293] 5.1.4. In development centres of national significance with no tramway network — purchase of new environmentally friendly buses, retrofitting existing buses with environmentally friendly technology, including alternative fuels, as well as establishment of related charging/filling infrastructure[294]		*state budget* *municipal budget*	150. By 31 December 2023: 50 new and rebuilt environmentally friendly public buses	
5.2. Activities of new support programmes of EU funds 5.2.1. Support for installing biomethane production (biogas refinement) facilities and biomethane supply for use in transport	MoE	EUR 100 million *EU funds,* *climate funding (EAAI, Modernisation Fund)* *state budget* *municipal budget*		
5.3. Tax policy measures 5.3.1. Increasing vehicle operation tax (hereinafter — VOT) by 30 % for high emission vehicles (>200 g CO_2/km) or vehicles with engine displacement >3,500 cm^3 first registered after 31.12.2008	MoT, MoF	*tbc* *state budget* *municipal budget*		Consumption of diesel reduces and consumption of biofuels and electricity increases in the transport sector in

[292] The measure is already included in the baseline scenario (see Annex 3)
[293] The measure is already included in the baseline scenario (see Annex 3)
[294] The measure is already included in the baseline scenario (see Annex 3)

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
5.3.2. VOT increase for all vehicles by 10 % (according to the existing classification by CO_2/km) 5.3.3. Complete tax exemption (VOT, CCT, also regardless of the intended use of the car in the company) for low emission vehicles (< 50 g CO_2/km) 5.3.4. Review of the excise duty for biomethane and biofuels — rates as low as possible or reduced excised duty in comparison with fossil fuels (after assessing production costs[295]) and other alternative fuels[296] 5.3.5. Increasing the excise duty for fuel by 20 % compared to the baseline scenario 5.3.6. Introduction of a tax for CO_2 based on the amount of GHG emissions from fuel				the modelled tax increase scenarios. By 2–4 % compared to the baseline scenario. As a result of using new and more efficient vehicles, final energy consumption in the transport sector is reduced by about 12.8 % (5.5 PJ) in 2030 compared to 2020 despite higher indicators of mobility. About 55,000 vehicles are using alternative fuels (CNG, LNG,
5.4. Promotion measures 5.4.1. Development of cycling infrastructure in Rīga and Pierīga by constructing bicycle lanes in Rīga/Pierīga in the length of at least 50 km 5.4.2. Development of public transport by optimising public	MoT, MoEPRD, local governments	*tbc* *EU funds,* *climate funding (EAAI, Modernisation Fund)* *state budget*		

[295] Reduction of excise duty is considered to be state aid, which can be granted according to Guidelines on State aid for environmental protection and energy. According to the current guidelines for 2014–2020 (2014/C 200/01), the following conditions apply and could also be in force after 2020: 1) the aid per unit of energy shall not exceed the difference between the total levelised costs of producing energy from the particular technology in question and the market price of the form of energy concerned; 2) the aid shall be granted only until the plants are fully depreciated; 3) excise duty rates shall be reviewed regularly based on production costs (at least once a year).

[296] Fuels or power sources which serve, at least partly, as a substitute for fossil oil sources in the energy supply to transport and which have the potential to contribute to its decarbonisation and enhance the environmental performance of the transport sector. They include, inter alia:
- electricity;
- hydrogen;
- biofuels as defined in Article 2 (i) of Directive 2009/28/EC;
- natural gas, including biomethane, in gaseous form (compressed natural gas — CNG) and liquefied form (liquefied natural gas — LNG).

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
transport networks and coverage, availability of one-hour tickets for all passengers 5.4.3. Park & Ride development and connecting the infrastructure with the public transport network (including payment for the use of Park&Ride services with the public transport ticket of Rīga) 5.4.4. Promoting the purchase of EVs		*municipal budget*		biogas, electricity (only BEV)) in 2030. Consumption of alternative fuels (CNG, LNG, biofuel, biogas and electricity) in road transport is increasing and amounts to 4.4 PJ in 2030. It corresponds to about 11.8 % of the total consumption in the transport sector. About 7.7 PJ of fossil fuel are replaced. Consumption of biogas in the transport sector is 0.62 PJ in 2030. In comparison with the scenario without alternative fuels, total costs of the road transport sector
5.5. Obligations 5.5.1. Mandatory admixture of biofuel of at least 10 %[297] 5.5.2. Promoting biogas extraction and biomethane production in by holdings of the 1st cluster 5.5.3. Mandatory obligation for using biomethane in public transport[298] 5.5.4. Green public procurement for the vehicle fleet of the central government and local governments pursuant to Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles[299] 5.5.5. Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure[300]	MoE MoA MoEPRD	*tbc* *EU funds,* *climate funding (EAAI, Modernisation Fund)* *state budget* *municipal budget*		

[297] The measure is already included in the baseline scenario (see Annex 3)
[298] It will be specified whether the obligation applies at national level or to fuel suppliers
[299] The measure is already included in the baseline scenario (see Annex 3)
[300] The measure is already included in the baseline scenario (see Annex 3)

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
				decrease by about EUR 183 million in the period from 2020 to 2030, which includes costs for vehicles, costs for the fuel consumed, and costs for infrastructure development.
6. Policy for more efficient support to energy efficiency *decarbonisation; energy efficiency; energy security; innovation, research and competitiveness*				
<u>6.1. Support for introducing complex smart energy technologies</u> 6.1.1. Transition to low-temperature LH systems when such transition is economically justified 6.1.2. Implementation of complex energy efficiency measures	MoE	EUR 50 million *EU funds,* *climate funding (EAAI, Modernisation Fund)* *state budget* *municipal budget*	Indicative indicators: 1) Average energy consumption for heating in buildings after implementing measures for improving energy efficiency 2) Heat and electricity savings achieved in the renovated group of buildings 3) Modernisation of thermal energy	

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			capacities using RES 4) Additional capacity from RES 5) Estimated annual reduction of greenhouse gas emissions	
6.2. Support for introducing innovative energy efficiency technologies 6.2.1. Support for introducing innovations in the area of energy efficiency and creating new technologies and processes in the area of energy efficiency		EUR 70 million *EU funds*	Indicative indicators: 1) Number of cooperation projects supported 2) Number of new technologies created in the area of energy efficiency 3) Energy savings of economic operators that have received support 4) Estimated annual reduction of greenhouse gas emissions of economic operators that have received	

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			support	
6.3. Support for establishing energy efficiency clusters 6.3.1. Cooperation between scientists and enterprises in energy efficiency 6.3.2. Cooperation between enterprises in energy efficiency by establishing clusters		EUR 50 million *EU funds*	Indicative indicators: 1) Number of economic operators supported 2) Energy savings (indirect) of economic operators that have received support 3) Estimated annual reduction (indirect) of greenhouse gas emissions of economic operators that have received support	
7. Complex solutions for promoting innovation *decarbonisation; energy efficiency; innovation, research and competitiveness*				
7.1. Development of acceleration and risk capital funds 7.1.1. Availability of funding for companies in the form of investments from the pre-seed stage up until the growth stage	MoE	EUR 100 million *EU funds*		
7.2. Implementation of the technology transfer process 7.2.1. Support for commercialising research results, thus		EUR 65 million		

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
increasing the income of research organisations from commercialising research results, as well as promotion of innovation activity in SMEs by providing access to outsourcing for the development of new products or technologies		*EU funds*		
7.3. Establishment and operation of the Innovation and Technology Support Fund of Latvia (ITSFL) 7.3.1. Transformation of an enhanced and more sustainable structure of the Latvian economy to production of more technology-intensive goods and services, thus strengthening the position of Latvian economic operators in export markets and the ability to enter the global product supply chains		EUR 600 million *EU funds*		
7.4. Cluster programme 7.4.1. Ensuring integrated support to clusters and their members — economic operators		EUR 52 million *EU funds*		
7.5. Support for implementing FDI projects in the fields of smart specialisation 7.5.1. Establishment of a support instrument that would provide an opportunity to attract foreign capital more successfully for implementing large-scale investment projects in Latvia by also promoting technology transfer and higher productivity		EUR 42 million *EU funds*		
7.6. Support to innovative research projects in the field of RES, including demonstration or technology testing projects in locations where it is permissible according to territorial		*EU funds*		

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
development planning documents				
7.7. Establishment of digital innovation centres in Latvia 7.7.1. Integrated support for integrating digital technologies and wider use thereof in industry sectors and public administration		EUR 10 million *EU funds*		
8. Reduction of energy poverty *energy security*				
8.1. Harmonised conditions for partial support to protected users for covering thermal energy costs	MoE	*tbc*		
9. Informative and regulatory measures *all dimensions*				
9.1. Establishing the principle of energy efficiency as a horizontal objective in support programmes of EU funds (in the ESF Operational Programme 2021–2027) 9.2. Information measures — annual information campaigns	Sectoral ministries	*Not envisaged*		
10. Policy for reducing GHG emissions in agriculture *decarbonisation*				
10.1. Precision fertilisation (target holdings: 2nd cluster, representing 0.1 % of all holdings, managing 9 % of the utilised agricultural area, managing 30 % of all wheat areas and 10 % of all rapeseed areas in the country)	MoA	Funding required for implementing the measures is determined in discussions about the allocation of support from EU funds	Indicatively, 37.5 % of wheat and rapeseed areas managed by holdings of the 2nd cluster.	Reduction of N_2O emissions from reducing the use of nitrogen fertilisers (use of nitrogen reduced by 8 %)
10.2. Direct introduction of fertilisers in soil (Option 1:			Indicatively, 50 %	Reduction of N_2O

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
transportation of liquid fertilizer by using a system of hoses and application with the help of injectors; target holdings: holdings of the 1st cluster, representing about 0.3 % of all holdings, rearing 23.5 % of all cattle 66.4 % of all dairy cows, 88.3 % of all poultry, and 90.4 % of all pigs in the country. Option 2: transportation of liquid fertiliser with a barrel and application with the help of injectors; target holdings: holdings of the 1st cluster, representing about 0.3 % of all holdings, rearing 23.5 % of all cattle, 66.4 % of all dairy cows, 88.3 % of all poultry, and 90.4 % of all pigs in the country)			of the utilised agricultural area managed by holdings of the 1st cluster.	emissions from reducing the use of nitrogen fertilisers (reduction of nitrogen fertilisers by 12.3 kg N ha^{-1})
10.3. Separation of liquid manure (target holdings: 1st cluster, representing about 0.3 % of all holdings, rearing 23.5 % of all cattle, 66.4 % of all dairy cows, and 90.4 % of all pigs in the country; 4th cluster, representing about 4.2% of all holdings, rearing 27.9% of all cattle, 7.5% of all dairy cows, and 1.4% of all pigs in the country)			Indicatively, 15 % of all cattle and pigs reared in the holdings of the 1st cluster and 5 % of all cattle and pigs reared in the holdings of the 4th cluster.	Reduction of CH_4 emissions from manure management (reduction of CH_4 emissions by 20 %)
10.4. Planning feed rations (target holdings: 1st cluster, representing about 0.3 % of all holdings, rearing 66.4 % of all dairy cows; 3rd cluster, representing about 25.4 % of all holdings, rearing 20.7 % of all dairy cows; 4th cluster, representing about 4.2 % of all holdings, rearing 7.5 % of all dairy cows)			With regard to the 1st cluster it was assumed that this measure is binding to 10 % of all dairy cows, since planning feed rations is already a	As a result of balanced energy, emissions of CH_4 reduce by 14 %, milk yield is increased by 10 % a year

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			common practice in this group of holdings. With regard to the 3rd and 4th cluster this measure is binding to 50 % of dairy cows.	
10.5. Improvement of feed quality (target holdings: 3rd cluster, representing about 69.8 % of all holdings, rearing 20.7 % of all dairy cows; 4th cluster, representing about 4.2 % of all holdings, rearing 7.5 % of all dairy; 5th cluster, representing about 4.2 % of all holdings, rearing 5.4 % of all dairy cows)			Indicatively, 50 % of all dairy cows reared in the holdings of the 3rd, 4th, and 5th cluster.	Reduction of CH_4 emissions as a result of food digestibility improvement from 66 % to 67 %
10.6. Maintenance of amelioration systems (target holdings: all holdings)			Indicatively, 639,023 ha (40 % of 1.6 million ha ameliorated before), divided by clusters: 1st cluster: 3 % of utilised agricultural area; 2nd cluster: 4 % of utilised agricultural area; 3rd cluster: 36 % of utilised agricultural area; 4th cluster:	Reduction of the area subject to runoff and indirect N_2O emissions

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			79 % of utilised agricultural area; 5th cluster: 43 % of utilised agricultural area.	
10.7. Fertilisation planning (target holdings: only data from the 3rd cluster were used for calculating the potential reduction of GHG emissions, since consumption in other clusters is not that significant to achieve nitrogen savings as a result of fertilisation planning. The 3rd cluster represents about 25.4 % of all holdings in the country managing about 46.2 % of utilised agricultural area)			Indicatively, 27 % of the agricultural area managed by the 3rd cluster.	Reduction of N_2O emissions from reducing the use of nitrogen fertilisers (use of nitrogen reduced by 27 %)
10.8. Promotion of biogas production (target holdings: 1st cluster, representing about 0.3 % of all holdings, rearing 23.5 % of all cattle, 66.4 % of all dairy cows, 88.3 % of all poultry, and 90.4 % of all pigs in the country)			Indicatively, 35 % of dairy cows, 50 % of other cattle, 15 % of pigs, and 20 % of poultry from holdings of the 1st cluster.	Reduction of CH_4 and N_2O emissions from the manure management system
10.9. Nitrogen sequestration (inclusion of legumes in crop rotation) (target holdings: only data from the 1st, 2nd, and 3rd cluster were used for calculating the potential reduction of GHG emissions, since consumption of nitrogen in other clusters (4th and 5th) is not that significant to achieve nitrogen savings. Holdings of the 1st, 2nd, and 3rd cluster represent about 26 % of all holdings in Latvia and manage about 70 % of utilised agricultural area)			Indicatively, 12.5 % of cropland area managed by holdings of the 1st, 2nd, and 3rd cluster.	Reduction of N_2O emissions from reducing the use of nitrogen fertilisers (-62.4 kg N t ha^{-1})

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
11. Policy for promoting the reduction of GHG emissions and CO_2 sequestration in LULUCF activities *Decarbonisation*				
11.1. Reconstruction and restoration of amelioration systems in cropland	MoA	Funding required for implementing the measures is determined in discussions about the allocation of support from EU funds.	Maintaining soil fertility in areas with restored amelioration systems (8 thousand ha indicatively).	Reduction of carbon accumulation in mineral soils by 7 t ha^{-1} if amelioration systems are not restored
11.2. Support for introduction and promotion of integrated horticulture			Maintaining the area of orchards (500 ha indicatively) by ensuring increased carbon accumulation in orchards.	Difference from the alternative scenario is 73 t ha^{-1}
11.3. Maintenance of biodiversity in grasslands			Reduction of GHG emissions by transforming croplands in organic soils into perennial grasslands (2,000 ha indicatively)	Reduction of CO_2 emissions in transformed organic soils by about 0,5 t C ha^{-1} annually
11.4. Cultivation of legumes			Increasing carbon input in mineral	Increase of carbon accumulation in soil by

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			soils in conventional and biological farms (23,000 ha indicatively)	7 t ha^{-1}
11.5. Reconstruction of amelioration systems in forest lands			Preparation of stable carbon sequestration potential in ameliorated areas (12,000 ha indicatively)	Implementation of an alternative scenario (not restoring amelioration systems) would reduce carbon accumulation by 42 t ha^{-1} (growth pace models, LIFE REstore results)
11.6. Increasing resilience of forest ecosystems and their ecological value				Increased carbon accumulation in living biomass and other carbon sinks with the help of timely coppice cultivation thinning (21 t CO_2 ha^{-1} in 10 years). Impact assessment according to growth pace models
11.7. Restoration of forest stands destroyed as a result of natural disasters			Increasing the potential of carbon accumulation in areas having	Increasing the potential of carbon accumulation in areas having experienced species

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			experienced species replacement (a total of 10,000 ha indicatively, 100 t CO_2 ha^{-1} in 90 years).	replacement (100 t CO_2 ha^{-1} in 90 years). Impact assessment according to growth pace models
11.8. Establishment of new orchards			Establishment of new orchards, 30 ha/year indicatively Maintaining the area of orchards by ensuring increased carbon accumulation in orchards.	Increased carbon input in soil with plant residues, creation of a new carbon sink — wood biomass. Difference from the alternative scenario is 73 t ha^{-1}
11.9. Reconstruction and restoration of amelioration systems in cropland				Maintaining soil fertility in areas with restored amelioration systems. Reduction of carbon accumulation in mineral soils by 7 t ha^{-1} if amelioration systems are not restored
11.10. Undersowing in winter crops			Area with undersown crops,	Increasing carbon input in mineral soils in conventional farms,

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			indicative 17,500 ha/year	ensuring the increase of carbon accumulation in soil by 7 t ha^{-1}
11.11. Introduction of cultivation of legumes in the conventional crop rotation			Area with legumes in rotation, 332,875 ha by 2030 indicatively	Increasing carbon input in mineral soils in conventional and biological farms, ensuring the increase of carbon accumulation in soil by 7 t ha^{-1}
11.12. Green fallow before winter crops			Area treated with green manure, indicative 100,858 ha by 2030	Increasing carbon input in mineral soils in conventional farms, ensuring the increase of carbon accumulation in soil by 7 t ha^{-1}
11.13. Coppice cultivation thinning			Increased carbon accumulation in living biomass and other carbon sinks with the help of timely coppice cultivation thinning in an area of 120,000 ha indicatively (21 t CO_2 ha^{-1} in	Impact assessment according to growth pace models

Policy / Measures	Competent authority(-ies)	Funding[283] required for implementing the measure and possible sources of funding[284]	Proposed performance indicators	Impact assessment
			10 years).	
11.14. Afforestation and improvement of the quality of forest stands in naturally afforested lands			Increased carbon accumulation in afforested lands (a total of 10,000 ha indicatively, 462 t CO_2 ha^{-1} in 80 years in mineral soils and 2,106 t CO_2 ha^{-1} in organic soils).	Impact assessment according to growth pace models and LIFE REstore projects