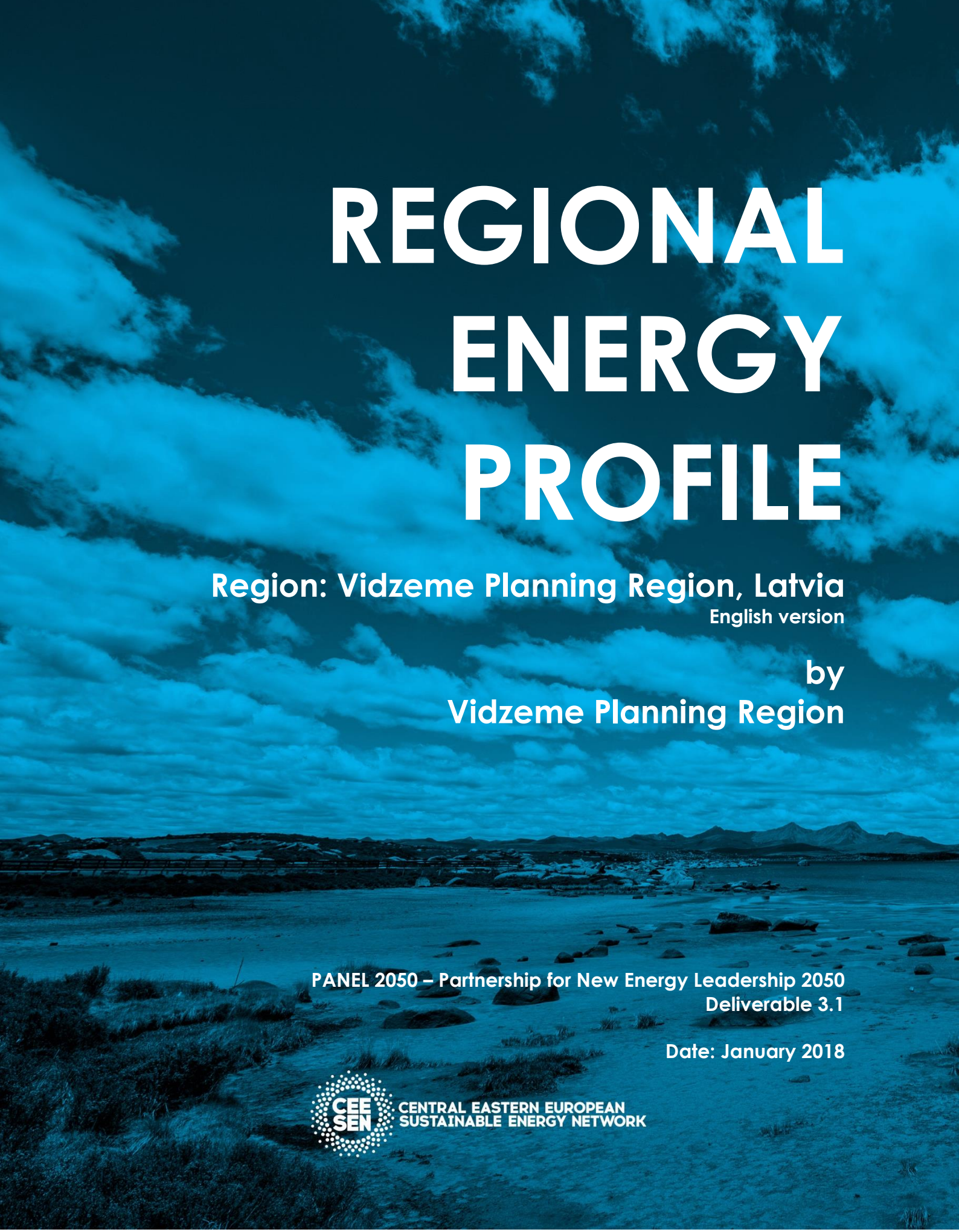

REGIONAL ENERGY PROFILE

Region: Vidzeme Planning Region, Latvia

English version

by

Vidzeme Planning Region

PANEL 2050 – Partnership for New Energy Leadership 2050
Deliverable 3.1

Date: January 2018

CEE SEN CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

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1. Methodology

The PANEL 2050 project has the aim to create durable and replicable sustainable energy networks at local (municipality/community) level, where relevant local stakeholders collaborate for the creation of a local energy visions, strategies and action plans. The aim of these networks is to contribute to and actively work for the transition towards low carbon communities in 2050.

The PANEL 2050 partnership will provide support for the creation of first successful local energy networks in the CEE countries. In the course of the project, organisations from 10 CEE countries will collaborate on creating regional energy strategies and action plans.

The present Regional Energy Profile was prepared in order to get a better understanding of the energy-related status quo in the Vidzeme Planning Region, analysing strengths and challenges with regard to the transition towards a low carbon community. This energy profile constitutes the groundwork for the preparation of a Regional Energy Roadmap and related Action Plans and will be essential for the communication with regional stakeholders.

For completing this Regional Energy Profile, the following sources were used:

- Data bases of the Central Statistical Bureau of Latvia (http://www.csb.gov.lv/en/about-us);
- Ministry of Economics of the Republic of Latvia;
- Ministry of Environmental Protection and Regional Development of the Republic of Latvia;
- Interviews and meetings with representatives from municipalities from Vidzeme Planning Region.

2. General introduction of the region

Vidzeme Planning Region is at NUTS 3

Geography and policy:
Vidzeme is the territorially largest of the five planning regions in Latvia, occupying 23.6 % of the country's territory. Vidzeme is a border region of the European Union, which is crossed by several major international transport corridors, ensuring Vidzeme a direct contact with major regional centres of the neighbouring countries – Tartu and Tallinn in Estonia, Pskov, Novgorod and St. Petersburg in Russia. Around these corridors, the development zones significant to the strategic development of the Baltic Sea region are formed, such as the VHB Zone Hanseatica Development Corridor, the South Baltic Rim development corridor, as well as Via Baltica.

Geography of the region
The leading energy resources available in Latvia and Vidzeme are biomass, hydropower, solar energy wind energy and geothermal energy. In Latvia, more than 150 small hydro power plants (HPP) are operating, which provide a total electricity production of more than 50 MWh per year. On the rivers of the Vidzeme region, 50 small hydroelectric power stations (9 on the river Gauja, 5 on the river Abuls) have been built. Their hydroelectric energetic potential is rather small.

The solar radiation on a horizontal surface ranges between 900 and 1100 kWh/m2 in the Baltic region. Majority of the radiation is obtained during the summer period. The Solar radian energy in Vidzeme can be used for an average of 1700 hours per year. Use of solar collectors in Vidzeme provides good results. The global solar radiation in our latitudes varies according to the time season - from May to September from 1 m^2 of the solar collector approx. 700-740 kWh/ m^2 can be obtained, from October to April – 200-240 kWh/ m^2, while from November to February – 40-50 kWh/ m^2. The total Baltic wind energy potential is rated from 4.5 to 7 TWh per year (in Estonia – 4 TWh, in Latvia up to 1.5 TWh, in Lithuania – 1.5 TWh). The best conditions for constructing WPS are in Latvia, on the coast of Kurzeme, a little worse – in Vidzeme, near to the Estonian border. Currently, there are wind turbine with a total capacity of 30 MW installed in Latvia, mainly in Kurzeme. Using of wind energy in Vidzeme is not developed yet. However, energy production in the Vidzeme Planning Region using wind energy is potentially possible in the Vidzeme highlands, where there is a sufficient wind intensity.

The favourable conditions for peat formation processes provides the region with peat resources and peat exports to foreign countries. The largest peat bog areas are located in lowlands. Overall, on 1 January 2012, the explored amount of peat is 25 702 thousand tons with the humidity of 40%. In terms of peat stocks, the Vidzeme region is followed by surrounding areas of Riga and the Latgale region, where the peat stock is greater. In the recent decades, extraction and use of peat as organic fuel has decreased substantially, but, depending on the specifics of the region, the peat extraction potential can be assessed. In Vidzeme, considerable peat resources are available, but their use in energy production is negligible.

Vidzeme is the region in Latvia richest in forests – they occupy 55.8% of the region's territory. Compared to 2007, the share of forests has increased by 7.2% which is 108.7 thousand ha, mostly on the expense of overgrown farmland. 54.9% of the forest area is covered by deciduous trees. Due to the large forest areas, the most affordable renewable source of energy in Vidzeme is biomass, made up from forestry and woodworking residues, used wood, shrubs, fuelwood plantations, agricultural residues and various types of organic waste.

Brief history overview of the region related to energy

In the 18th century, weaving of flax cloth for the market, as well as woodworking manufactories and papermills developed in the territory of Latvia. In the second decade of the 19th century, a paper mill was developed in Līgatne, which operating until 2015. In October 2003, Līgatne paper mill started the production of recycled paper.

According to the value and amount of production, the dominant industries of the early 19th century were manufacturing of spirits and textile. In the 2nd half of the 19th century, Vidzeme and Kurzeme were two of the Russian provides where mechanical engineering was the most advanced industry – rail cars, ships, turbines, motors, steam machines, boilers, equipment for sawmills, as well as leather, paper and food manufacturing was produced there. Up to the First World War, the industrial development, which was characterized by concentration of production, merging companies into syndicate, etc., did not change the industrial location and specialization, which had developed in the 1990s, but intensified the diversity of the industrialisation and distinct development of Latvian coastal areas and inland areas even more.

Nowadays, the main industrial centre of Vidzeme, is Valmiera. It is the town where such major manufacturing and trading companies of the Vidzeme region as JSC "Valmiera Glass", agricultural co-operative "Vidzeme agroeconomic cooperative society", JSC "Valmiera Milk", Limited liability company "Vidzemes agroceltnieks", "Valpro" Ltd. and others are located.
In turn, the largest company by turnover located in Cēsis, is "Cēsu Alus", which operates in the food production sector.

In Smiltene, companies with the largest turnover are operating in logging and production of wood products ("Stora Enso Latvija" JSC, "Graanul Invest" Ltd., "GraanulPellets" Ltd.), as well as in retail ("Madara 89"), road construction ("8 CBR" Ltd.) and food production ("Smiltene Milk"). In the Gulbene district, the only distribution and servicing dealers of agricultural machinery produced in Belarus and the Russian Federation "M.T.Z. serviss" Ltd. and "Kombainserviss" Ltd., as well as the wood processing company „Avoti SWF" Ltd. – an IKEA furniture factory – are located.

Several companies in Vidzeme also are keen about using RES. "KRK Vidzeme" Ltd. is the largest charcoal manufacturing company in the Baltics with more than ten years of experience. Every year the company produces about 3,500 tons of high quality charcoal. Within the production process, alder wood, bought from local suppliers, is used. The brewery "Cēsu alus" demonstrates an economically efficient use of energy, by leavening sludge collected in

wastewater pre-treatment and producing biogas, and by further using it for heat supply.

"Biodegviela" Ltd. illustrates alternative means of using agricultural products, by using grain to create "green energy". A company in the Madona district produces agricultural ethyl alcohol. The raw material used for producing ethyl alcohol are grains, mainly rye, wheat, triticale. During the technological process, bioethanol, which is a fuel component and is mainly used in vehicles, is derived. Also, Vidzeme region has 5 biogas plants that produce biogas from manure and green fodder. Ltd. Biodegviela uses distillery refuse as a raw material for the production of alcohol. Two biogas plants use domestic waste (CA landfill "Daibe"), and food industry waste (farm "Zemturi") as raw materials. The Vidzeme region holds the first place among other Latvian planning regions in terms of number of biogas production stations.

Current energy planning process in Latvia and Vidzeme Planning Region

In Latvia, the overall development planning procedures, including in the energy field are governed by the Development Planning Act and the Law on Development Planning System. The Sustainable Development Strategy 2030 (Latvia 2030), describing the current situation in Latvian, points out that despite the fact that the overall energy intensity or energy consumption of the Latvian economy per one unit of GDP produced has gradually decreased in recent years, it is still nearly two times higher than the EU average. Therefore it is necessary to significantly improve the performance levels in both energy end-user groups, as well as energy generation and transmission, setting a specific goal: "To ensure national energy independence, by increasing energy self-sufficiency and integration into the EU energy networks ". The mid-level planning document „The Latvian National Development plan 2014-2020 (NDP 2020)" in the course of action „Energy efficiency and energy production" emphasizes the increasing the use of RES, raising of energy efficiency in the production sector and need of increasing energy efficiency of public and residential buildings. The Energy Development Guidelines 2016-2020 (the Guidelines) is a policy planning document that sets out basic principles, goals and lines of action in energetics of the Latvian government for the period from 2016 to 2020. The Ministry of Economics is responsible for the implementation of guidelines. In a regional level, goals of energy are determined by the Sustainable Energy Action Plan, while in municipalities the energy sphere is included in the municipal development strategies and the Energy plan, if such a plan has been developed in the municipality.

Energy potential of Vidzeme Planning Region

The Vidzeme Planning Region is the „greenest" region in Latvia, if the main criteria is the use of the renewable energy resources in the production of heat and electricity. In Vidzeme in incineration facilities (boiler houses, industry and other sectors) 75% of wood is used. In most cases it is firewood, chip, pellets and wood processing waste. The great proportion of the renewable energy sources (RES) in the VPR can be explained by the fact that 55,8% of the region is covered by forests and there care enough raw materials for wood. In turn, the most advanced waste management practice in Latvia is implemented in Northern Vidzeme. Biodegradable waste management is one of the areas of the bio-economy where VPR has development opportunities. Up to now, the need of organic waste treatment has been identified, compositing sites have been developed and are operating, biogas stations, where municipal waste is used for producing biogas, are operating.

Taking into account the needs, resources and potential of the Vidzeme inhabitants, VPR has set a goal in the Development programme 2015-2030 to improve the management of energy issues as well as to increase energy efficiency and use of renewable energy by 2020.

3. Basic demographic data and figures

Regional demographic indicators:

Population of region	195998	cap
Area of region	15245	km²
Population density	13	cap/km²
Number of individual municipalities	26	municip alities

Data from 2015

Basic demographic data

In Vidzeme region, at the beginning of 2016, there were 195998 inhabitants. In the two largest cities of the region (Valmiera and Cēsis) lives about 21% of the total population of the region. If in 2015 the population of Latvia has declined by about 5.1% compared to 2010, then in the Vidzeme region it has declined by 7.5% during the same period. The steepest decline (more than 10%) has occurred in the municipalities of Alūksne, Rauna, Strenči and Valka. By contrast, the smallest decline (less than 5%) has occurred in Burtnieki, Kocēni, Pārgauja and Smiltene municipalities.

In Vidzeme region, in 2015, 61.5% of the population were of working-age. The aging of the population continues. The ratio of the working-age population has

declined by 1.8 percent points in 2015 compared to 2010. At the same time, the ratio of people above the working-age has increased by 1.5% percent points.

Unemployment rate	9.4	%
Average annual income per capita (gross)	8016	EUR
difference from the EU average (23,335.88 EUR gross annual earning)	76,76 65,65	%
Share of employees in		
agriculture	15.9	%
industry	18.6	%
services	56.5	%
Share of population with tertiary education	27	%

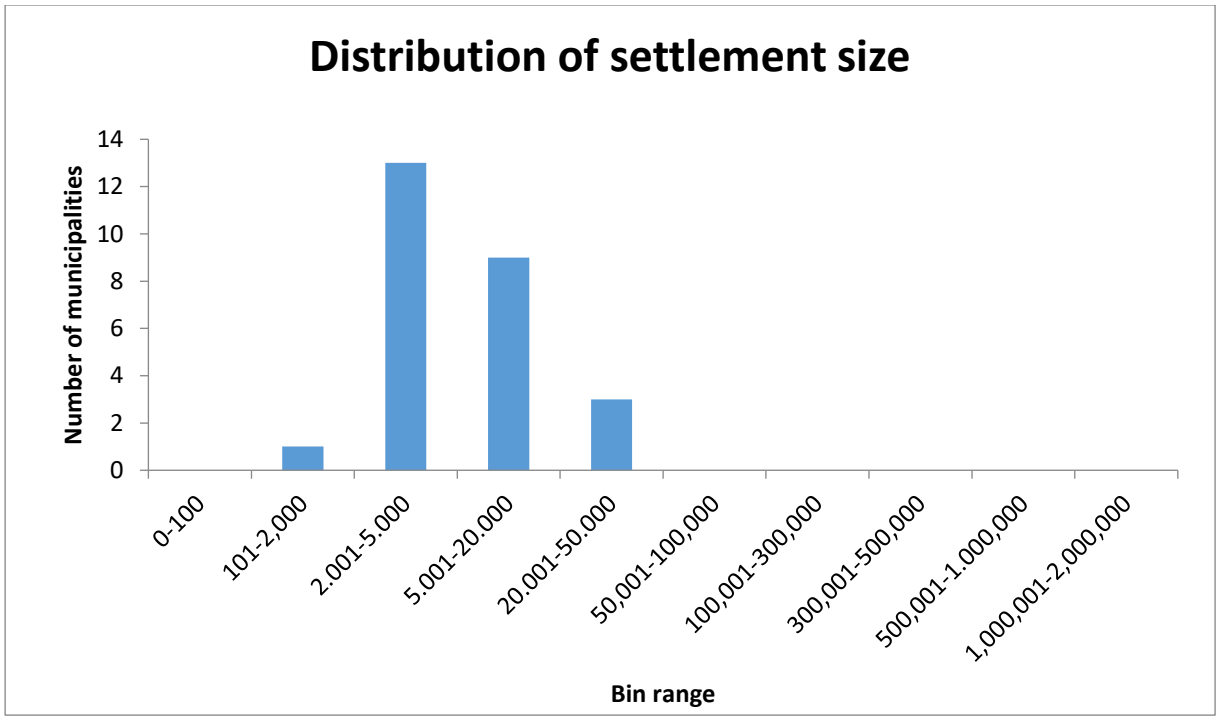
Economic development over the past six years has contributed to an increase of about 44% in GDP per capita in Vidzeme region. In 2015, the GDP per capita in Vidzeme region was 8061 EUR/inhabitant.

The largest share of the population in Vidzeme region is employed in the service sector (56.5%) followed by industry (18.6), agriculture and forestry (15.9%) and construction (9%). Analysis of the service sector shows that most are employed in the trade and catering services (25%) and in education (19.6%). The total number of employed population in the last six years has remained almost unchanged, but the structure of employment has changed. The most significant decline in the number of employed population was observed in trade, accommodation and catering, as well as in agriculture and forestry. At the same time, growth has been registered in information and communication sector, processing industry, construction sector, and health and social care.
In the Vidzeme region, about 43.6% of population in the age range of 15-64 have secondary and higher education. 23.4% of population in this population group have at least general secondary education.

Thanks to economic development, the unemployment rate in Vidzeme region has decreased from 15.7% in 2010 to 9.4% in 2016. This is lower than the average unemployment rate in Latvia and the second lowest among all regions of Latvia.

The spatial distribution of the population, level of urbanisation

In terms of population, the largest development centre is Valmiera with 24.2 thousand inhabitants, which is followed by Cēsis (16.9 thousand inhabitants). More than 8 thousand people live in three other development centres – Madona, Gulbene and Alūksne. There are 5.5 thousand inhabitants in Valka and Smiltene.



4. Regional economy and economic trends

Regional economic indicators:

GDP, total	1592.028	million EUR
GDP per capita	8061	EUR/cap
HDI	0.83	

Data from 2015

GDP per economic sectors:		
Agriculture	14.9	% of total VA
Industry	20.6	%
Services	58.2	%

Data from 2015

Regional economy

Latvia's economic activity is largely concentrated in the capital city of Riga and Riga region, which in 2015 accounted for about 68% of GDP in Latvia. The contribution of other regions of Latvia is 6.5% to 9.4% of the gross domestic product.

The share of Vidzeme region in Latvia's GDP in 2015 is 6.5%, which is 1592028 thousand EUR. The share of the region in the total Latvian GDP has remained almost unchanged over the past five years. The growth of Vidzeme region's GDP (in current prices) in 2015 compared to 2010 is the second largest after the Riga region and is 32.7%. It has increased GDP per capita by 44.5%.

The largest contribution to the production of the Vidzeme region's value added (see fig. below) is provided by the service sector, followed by manufacturing and agriculture.

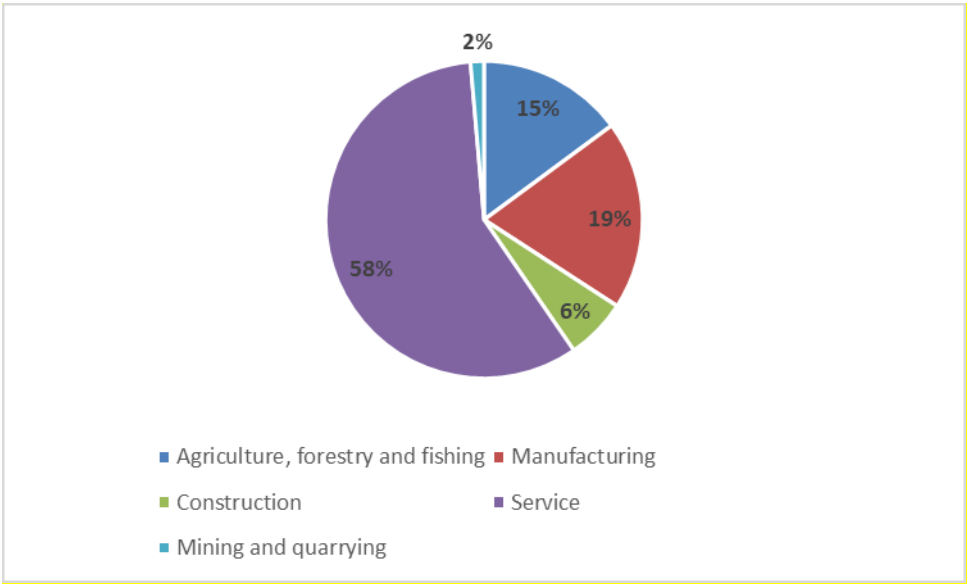


Figure1 Value added in Vidzeme region in 2015 by sectors

The HDI is a summary measure for assessing progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. Latvia's HDI value for 2015 is 0.830 which puts the country in the very high human development category — positioning it at 44 out of 188 countries and territories. Due to stable development HDI value has increased from 0.810 (2010) to 0.830 (2015). Analysis of the changes in the values of individual indicators of HDI over the period of 2010-2015 shows the most rapid increase in the indicator value featuring economic development (GDP per capita).

Main contributing sectors to the regional GDP?

The produced value added (in current prices) in Vidzeme region in 2015 has increased by 31% compared to 2010. The most rapid growth was observed in agriculture and forestry (68%) and construction (54%), the development of which is largely dependent on state and local government orders and available financial resources, including the European Union Structural Funds Programmes. The value added of the industrial and services sectors has increased about the same (21%).

By analysing the structural changes in the value added produced over the period 2010-2015, it can be noted that the share of the agricultural and forestry sector has increased by about 3% percent points, but the share of the service sector has decreased by about 4% percent points.

Further analysis of the value added of the subsectors of the service sector shows that wholesale and retail trade accounts for 21%, real estate transactions, including real estate management activities 32%, education 13%, and health

care 6% of the value added of the total service sector. Sub-sectors such as information and communication services and accommodation and catering services account for only 2.2% and 2% respectively of value added in the service sector.

5. National and local energy strategies

Region	Brief description of current …	legal requirement OR voluntary initiative	National/ regional/ local level	Original title + link (if possible)	English title + brief description	Organisation in charge	Type (EE, EPB, RES, etc. or combination…)
Latvia	The NDP of Latvia 2014-2020 states 4 key energy targets (1) The proportion of energy produced from RES in the total gross energy consumption – at least 40% in 2020 (2) Energy consumption towards generating the GDP (in kg of toe equivalent per EUR 1000 of GDP) – 280 (in 2020) and < 150 (in	legal requirement	National	Latvijas Nacionālais attīstības plāns 2014-2020.gadam http://likumi.lv/doc.php?id=253919	National Development Plan for Latvia 2014-2020, material and resource efficiency and sustainable management of natural and cultural capital	Latvian Inter-Ministerial Coordination Centre	EE, RES

	2030), baseline 373 (2010) (3) Energy dependence: net energy resource imports/gross domestic energy consumption, plus bunkering (%) – 44.1 (in 2020) and <50 (in 2030), baseline 41.6 (2010)(4) Intensity of GHG emissions in the economy (tones of CO2 eq. per EUR 1000 of GDP) – 0.794 (in 2020) and 0.752 (in 2030), baseline 1.188.						
Latvia	**Energy savings according 2012/27/EU Directive Article 3. in: primary energy savings – 0.670 Mtoe (28**	legal requirement	National	Enerģētikas attīstības pamatnostādnes 2016-2020.gadam http://likumi.lv/ta/id/280236-par-energetikas-attistibas-	**National Energy Development Guidelines for 2014-2020** declines energy efficiency objectives	Ministry of Economics	EE

	PJ), final energy savings – 0.457 Mtoe (19 PJ)			pamatnostadnem-2016-2020-gadam			
Latvia		legal requirement	National	Latvijas Enerģētikas ilgtermiņa stratēģija 2030 – konkurētspējīga enerģētika sabiedrībai https://www.em.gov.lv/lv/nozares_politika/atjaunojama_energija_un_kogeneracija/normativie_akti_un_politikas_planosanas_dokumenti_/	**"Latvia's Long-term Energy Strategy 2030 – Competitive Energy for Society**" -long-term targets for security of energy supply, competitiveness, EE and the use of RES.	Ministry of Economics	EE,RES
Latvia		legal requirement	National	Vides politikas pamatnostādnes 2014.-2020. gadam http://likumi.lv/doc.php?id=265262	**Environmental Policy Guidelines for 2014-2020**- (1) foster resource efficiency through (green) innovation that would allow diverting secondary material from waste streams, promote material reuse, waste recycling and recovery, (2) enhance the rational use of resources and new technologies to decrease emissions from industry, transport and households	Ministry of Environmental Protection and Regional Development	RES

Latvia		legal requirement	National	Lauku attīstības programma 2014.-2020. gadam http://www.vmd.gov.lv/lauku-attistiba/statiskas-lapas/latvijas-lauku-attistibas-programma-2014-2020-gadam-?id=3089#jump	**Rural Development Programme 2014-2020** - promotion of resource efficiency through low-carbon economy in the agriculture, food and forestry sectors	Ministry of Agriculture	**EE**
Latvia		legal requirement	National	Enerģētikas likums http://likumi.lv/doc.php?id=49833	**Energy Law** defines the general framework of energy policy in Latvia. English translation available.	Ministry of Economics	EE
Latvia		legal requirement	National	Energoefektivitātes likums http://likumi.lv/doc.php?id=280932	**Law on Energy Efficiency**. In force since 29 March 2016. The aim - rationalization and management of energy resources. Defines obligation to make energy audits and to develop and implement energy management system in largest enterprises and municipalities	Ministry of Economics	EE
		legal requirement	National	Ēku energoefektivitātes likums	**Law on the Energy Performance of Buildings**, the requirements of the	Ministry of Economics	EPB

				http://likumi.lv/doc.php?id=253635 likums	Directive 2010/31/EC on Energy Performance of Buildings. English translation available.		
Latvia		legal requirement	National	Dzīvokļa īpašuma likums http://likumi.lv/doc.php?id=221382	**Law on Residential Properties**, states the provision of minimum EE requirements as one of obligated functions of the building management.	Ministry of Economics	EPB
Latvia		legal requirement	National	Uzņēmumu energoaudita noteikumi MK noteikumi Nr. 487, 26/07/2016 http://likumi.lv/ta/id/283807-uznemumu-energoaudita-noteikumi	Regulation - **The Methodology of Energy Audit in Enterprises**	Cabinet of Ministers of Latvia	EE
Latvia		voluntary initiative	National	Ieteikumi un rokasgrāmata enerģijas sektora plānošanai pašvaldībās https://www.em.gov.lv/lv/nozares_politika/energoefektivitate_un_siltumapgade/energoefektivitate/pasvaldibu_energoplani/	**Recommendations and Handbook for Energy Planning and Management in Municipalities**	Ministry of Economics	EE
Latvia	Dissemination action	voluntary initiative	National	Energoefektīvākā ēka Latvijā	**Annual competition - the most energy efficient building in Latvia**.	Ministry of Economics, Ministry of	EPB

				http://www.energoefektivakaeka.lv/index.php	Organised by Ministry of Economics, Ministry of Environmental Protection and Regional Development since 2010	Environmental Protection and Regional Development	
Latvia	Related projects	voluntary initiative	Regional	Jaunu metožu lietojums apmācībās par pielāgošanos klimata pārmaiņām un to mazināšanu http://www.energoplanosana.lv/about-us/project/en	EU Project - The project '**Training on climate and energy management issues for municipalities and different industries'** aims at finding solutions for introducing sustainable environment and energy management ideas in daily life practice, as well as increasing public awareness and participation in climate change mitigation. Goals of the project: To promote knowledge transfer between municipalities about greenhouse gas emission reduction solutions, and to increase overall awareness and knowledge about climate change through a multi-sectoral approach.	Ekodoma Ltd., Salaspils Municipality, Saldus Municipality, Jūrmala Municipality, Liepaja Municipality	EE

Latvia	Related projects	voluntary initiative	Regional	RES H/C Spread http://www.res-hc-spread.eu/en_GB/lv/	EU Project- RES H/C SPREAD project. Running from 2014 to 2017, the RES H/C SPREAD project has developed six regional pilot plans in the field of heating and cooling with renewable energies, in order to harmonize baselines and therefore allow better policy planning. The project involves six pilot regions (Castilla y Leon in Spain, Emilia Romagna in Italy, Salzburg in Austria, Riga in Latvia, Western Macedonia in Greece and Rhodope in Bulgaria) representing the main climatic zones in Europe	Ekodoma Ltd., Riga Municipality	EE
Latvia	Related projects	voluntary initiative	National	BUILD UPON http://buildupon.eu/	EU Project - **BUILD UPON**. Deep building renovation represents one of the single most critical tools to massively lower Europe's CO2 emissions, create jobs in the construction sector and improve the quality of	Liepaja Municipality	EPB

					the existing built environment for the good of European citizens. This Horizon 2020 project, aimed at helping European countries design and implement strong, long-term national strategies for the renovation of their existing buildings		
Latvia	Related projects	voluntary initiative	Regional	Koksnes enerģija un ekoloģiski tīras tehnoloģijas http://www.vidzeme.lv/lv/projekti/koksnes_energija_un_ekologiski_tiras_tehnologijas_woodenergy	**The Wood Energy and Cleantech** This EU project promotes wood as an energy source and improves knowledge about wood energy, eco-friendly techniques and clean technology. Knowledge regarding wood energy, clean technology (cleantech) and its applications are not sufficiently distributed to the stakeholders of energy production in all regions of the Central Baltic region. The project develops regional action	Vidzeme Planning Region, Latvian Rural Advisory and Training Centre/Forest Advisory Service Centre, Amata Municipality	EE

					plans and strategies on how to promote the effectiveness of wood energy.		
Latvia		voluntary initiative	National	Latvijas energoefektīvas būvniecības attīstības stratēģija BUILD UP Skills http://www.vidzeme.lv/lv/projekti/latvijas_energoefektivas_buvniecibas_attistibas_strategija_build_up_skills/info/	Programme Intelligent Energy Europa, **Project BUILD UP Skills Initiative.** Main aim of the project was to define National 2020 targets on energy savings and renewable energy contributions by the building sector in Latvia.	Riga Planning Region, Kurzeme Planning Region, Latgale Planning Region, Zemgale Planning Region, Vidzeme Planning Region, Latvia Association of Civil Engineers, Association of Heat, Gas and Water Technology Engineers of Latvia, Latvia Environmenta	EPB

						l Investment Fund, The Latvian Builders Association	
Latvia		voluntary initiative	Regional	BioRegions http://www.bioregions.eu/en_GB/project	**BioRegion**s. The project brought the development of bioenergy regions on a European level by building on the work of the most advanced areas.	Ekodoma Ltd., Limbaži Municipality	EE
Latvia		voluntary initiative	Regional	Ilgtspējīgas enerģētikas attīstības Rīgas plānošanas reģionā 2014.-2020.gadā Rīcības plāns http://www.rpr.gov.lv/uploads/filedir/Projekti/Global%20Vision/R%C4%ABc%C4%ABbs%20pl%C4%81ns_RPR_energoplanosanas_vadlinijas.pdf	**Long Term Energy Action Plan of Riga Planning Region 2014-2020**	Riga Planning Region	EE
Latvia		voluntary initiative	Regional	Pilsētas mēru pakts enerģētikas un klimata jomā http://www.pilsetumerupakts.eu/about/covenant-of-mayors_lv.html	**Convenant of Mayors for Climate Energy.** Pilsētu mēru pakta iniciatīvas ietvaros 19 Latvijas pašvaldības ir uzņēmušās CO2 samazinājuma	Balvi, Cēsis, Ikšķile, Jēkabpils, Jelgava, Jūrmala, Kārsava, Ķegums,	EE

					mērķus līdz 2020.gadam (20-55%)	Lielvārde, Liepāja, Limbaži, Līvāni, Ludza, Ogre, Rīga, Salaspils, Saldus, Tukums, Valka, Viļāni	
Latvia		voluntary initiative	Regional	Energoplānošanas vadlīnijas www.vidzeme.lv/upload/lv/Regionalie_petijumi/Energoplanosanas_vadlinijas.do	**Guidelines for Energoplanning in Vidzeme Planning Region.** Deliverable of the Project Wood Energy and Cleantech Prepared by external experts.	Vidzeme Planning Region	EE
Latvia		voluntary initiative	Regional	Survey of Management of Energy Planning Procedures in Vidzeme Planning Region http://www.vidzeme.lv/lv/regionalie_petijumi/50/128240/	**Survey of Management of Energy Planning Procedures in Vidzeme Planning Region.** Deliverable of the Project Wood Energy and Cleantech Prepared by external experts.	Vidzeme Planning Region	EE

6. Energy Production

6.1. Conventional energy production capacities (fossil fuels and nuclear power)

Name & Location (city, town)	Owner	Year of commis-sioning (refur-bishment)	Type of plant & fuel	Capacity in MW	Annual energy production in MWh	Annual CO_2-emissions in t	Utilization rate (qualitative assessment)
Valmiera	Private SME	2007	CHP & Natural gas	2 x 1,99 MW_{el}; 63,3 MW_{th}	224 040	28539	Constantly used
Cēsis	Private SME	2002	CHP & Natural gas, biomass	38,2 MW_{th}, 1,27 MW_{el}	40000	2269	Constantly used
Cēsis	Private SME	2011	CHP & Natural gas,	0.6 MW_{el}	4800 (electricity)	1692	Constantly used

6.2. Capacity of energy production in Vidzeme Planning Region

The capacity of fossil fuel power plants installed in Vidzeme region is small compared to the total electricity production capacity of the country. Therefore, main role is played by stock company "AS Latvenergo" power plants in the region and in Latvia as a whole. Whereas natural gas is imported from Russia, electricity production costs are largely dependent on fluctuations in natural gas prices. In Latvia, including Vidzeme region, district heating system (DHS) is widely used for the heat supply. DHS is widely used in cities for the heat supply for multi-apartment houses. In Vidzeme region, heat supply is provided

by 109 boiler houses with a total installed capacity of 348 MW. Approximately 56% of the supplied heat is produced using biomass.

6.3. Renewable energy production

Energy production capacities

Name & Location (city, town)	Owner	Year of commi s-sioning (refur-bishme nt)	Type of plant & fuel	Capa city in MW	Annual energy produc tion in MWh	Annual CO_2-emissio ns in t	Utilization rate (qualitativ e assessme nt)
Vidzeme region	Private SME		hydr o	MW_{el} 10.1	32415		Constantly used
Vidzeme region	Private SME		biog as	MW_{el} 9.25	42130		Constantly used
Vidzeme region	Private SME		Solid biom ass	MW_{el} 15.55	10163 5		Constantly used

The total RES power generation capacity in Vidzeme region is slightly over 34 MW. About 43% of the total RES capacity consists of biomass CHP, small HPP of about 30%, while the remaining part is supplied by biogas CHPs. When assessing the amount of electricity generated by the RES, it can be concluded that biomass CHP (56%) is the major part, followed by biogas CHP (35%), while the small HPP share is 19%. The development of RES power plants in previous years was due to the RES support mechanism - the FIT, which has now been shut down, and investment support programmes.

Most of the HPPs in Vidzeme region were built from 1996 to 2002. Their average capacity is 0.2 MW. The biomass CHPs building took place from 2012 to 2015, while the biogas CHPs were built from 2009 to 2011. The timing of the construction of biomass and biogas CHPs was affected by the time of implementation of the support programme.

In the EU Funds planning period of 2007-2013, the support to energy production from biogas was provided for the agriculture sector business entities & service co-operatives by national *Rural Development Programme*, co-financed by European Agriculture Fund for Rural Development (EAFRD). The support was

provided to develop the production of electricity in CHP mode by utilising biogas fermented in anaerobic processes from biomass of agriculture and forestry sector origin.

In the EU funds planning period of 2007-2013, the support was provided by the Cohesion Fund (CF) under the framework of the Latvian National Operation Programme „Infrastructure and Services", part „Energy". The "Energy" programme was aimed at increasing the efficiency of heat supply, reducing the loss of heat energy in district heating (DH) transmission and distribution systems and fostering replacement of imported fossil fuels with RES, including both the increase of heat production units and CHP units utilising the RES.
Thanks to this programme in the past five years, DHS boiler houses changed the fuel from natural gas to biomass. Biomass is also widely used for heating individual boilers in households and service and industry

6.4. Transmission and distributions

Transmission system
On 1 January 2012, "*AS Augstsprieguma tīkli*" was unbundled from "*AS Latvenergo*" and became an independent transmission system operator which is responsible for the development of the transmission network, security of electricity transmission, stability of the transmission network and quality of electricity as well as ensures it all in accordance with the technical and economic requirements and modern technologies. The company "AS Augstsprieguma Tīkli" is in charge of the transmission network in Latvia, which consists of 330 kV and 110 kV electricity transmission lines and substations. The Latvian electricity system, together with Estonia and Lithuania, works according to the principles of the Nordic Electricity Market „Nord Pool", where the supply and demand balance of the electricity is regulated within the framework of the electricity stock exchange.

Distribution system
In order to ensure the supply of electricity to users' objects, in the year 2015, eleven companies were performing distribution system operator functions in Latvia, the largest of which is „AS Sadales tīkls", part of „AS Latvenergo" group. Since 1 July 2007, „AS Sadales tīkls", an independent subsidiary of „AS Latvenergo", has been operating as an electricity distribution system operator. It provides electricity supply of to more than 99% of all electricity users in the country and the connection of new electricity users to the grid, as well as monitoring electricity usage, accounting for electricity consumption.
Low voltage 0.4 kV and medium voltage 6-20 kV electric equipment is used for distribution services.

District heating system

District heating systems is very wide spread in Vidzeme Planning Region. Large scale (>1-5 MW) District heating systems are in cities, smaller district systems (e.g. several multifamily buildings and some public buildings) are very typical in small towns.

Natural gas

Latvian natural gas supply system is not connected to the EU common natural gas supply system. Latvia receives gas only from Russia, but launching of Klaipeda liquefied natural gas terminal at the beginning of 2015 opened a possibility for Latvia to be supplied with a limited amount of gas from Lithuania. Up to 3 April 2017, when Latvian gas market was opened, only "AS Latvijas Gāze", a vertically integrated merchant, operated in Latvian natural gas market. On 11 February, the Saeima adopted amendments to the Energy Law. According to these legal requirements, the monopoly "AS Latvijas Gāze" was reorganized and independent (1) transmission system operator ("AS Conexus Baltic Grid") was established and started operation from January 2017, and (2) distribution system operator ("AS Gaso") was established and started operation from the 1 December 2017.

Regional capacity

The capacity of fossil fuel and RES power plants installed in Vidzeme region is small compared to the total electricity production capacity of the country and electricity demand in Vidzeme region. Therefore, main role is played by stock company "AS Latvenergo" power plants in the region and in Latvia as a whole. Well-developed transmission and distribution network ensure an electricity supply from "AS Latvenergo" power plants to Vidzeme region.

6.5. Jobs in the energy sector

Mostly jobs are related to small scale local biomass boiler houses operated manually. Other jobs are related to preparation, gathering and delivering of raw biomass, particularly, firewood. Next part of jobs related to production of wood chips and pellets.

7. Final energy consumption

7.1. Households

Regional final energy consumption of household sector	1148	GWh

Heat consumption

Total heat energy consumption of household's sector (heating and hot water consumption)	979	GWh
Average heat energy consumption per household	13.1	MWh/hh

Around 60% of all housing stock was built in period of 1960-1990. From those buildings around 80 % do not correspond to minimal energy performance requirements of building code. There is relatively slow renovation process in place due to high upfront costs, relatively low-income level of owners and very long payback time.

Electricity

Electricity consumption of households	163	GWh
Average electricity consumption per household	2188	kWh/hh

So far, there are no household's energy efficiency support programmes implemented in Latvia, aimed at replacement of inefficient electrical equipment.

Cooking

Gas consumption for cooking appliances of households	5	GWh

Whereas the existing natural gas network provides natural gas for only part of Vidzeme region's households, LPG and, in some cases, wood, are widely used for cooking.

General information

Household electricity price	0.165	EUR/kWh (incl. taxes)
Household natural gas price	0.0387	EUR/kWh (incl. taxes)
Household district heating price	0.0493	EUR/kWh (incl. taxes)
Household price: other energy sources – specify:		EUR/kWh (incl. taxes)
Energy expenditure by household	9.9	% of income

With the opening of the electricity market for households, the number of smart meters in households has grown rapidly over the last three years. As one type of the demand side management of electricity for households, a separate tariff component for connected capacities can be mentioned. This component stimulates consumers to assess the existing electrical equipment in households and the actual connection power needed and choose the optimal solution.

Energy poverty

Central Statistical Bureau survey results show that, on average, approximately 9.9% of household income is spent on expenses (fees) for energy and fuel. For different social groups the situation is different, but the worst situation is in the case of households with one pensioner or one adult with a child. According to the survey results in 2014, approximately 19% of households could not afford to keep the dwelling warm, that is, they were facing an energy poverty. One of the most important causes of energy poverty, besides high energy costs and low income of people, is the low energy performance of buildings and insufficient investments in renovation of building infrastructure.

7.2. Service Sector

Regional final energy consumption of service sector	619	GWh

Unlike households with the largest share of energy consumed for heating, the service sector accounts for roughly equal shares of electricity and fuel in the total final energy consumption by the sector.

The service sector plays a significant role in the economy of Vidzeme region, as it gives 58% of the total value added. Wholesale and retail trade accounts for 21%, real estate operations, including real estate management activities 32%, education 13%, and health care 6% of the total value added of the service sector. As known, in wholesale and retail, electricity consumption accounts for a significant part of the total energy consumed. The energy efficiency in

buildings, especially in public buildings, is an important factor in determining energy consumption in the service sector.

7.3. Industry

Total energy consumption of the industrial sector	725	GWh
Industry electricity price	0.142	EUR/kWh (incl. taxes)
Industry natural gas price	0.032	EUR/kWh (incl. taxes)

Manufacturing accounts for about 19% of the value added in Vidzeme region. From the numerical point of view, wood industry companies are most often followed by food industry companies. Non-metallic minerals, machinery and other industries are also represented. In 2015, value added in manufacturing has grown by about 21% in comparison with 2010 (in current prices). This, of course, has also determined the increase in energy consumption in the sector. Most of the total fuel consumed by the manufacturing industry is consumed by wood processing companies (about 50%), non - metallic mineral companies consume about 29%, while food processing companies account for about 14%. In the manufacturing sector, the dominant types of fuels are wood fuel and natural gas.

7.4. Transport

Regional final energy consumption of transport sector	1025.0	GWh

The density of the road network in Vidzeme region is considered sufficient because it provides accessibility from any populated area to the nearest administrative centre, joins the administrative centres with each other, as well as with the national capital city. The most intensive and most significant part of the unified road network is the state roads and especially the major highways of the country. Municipal roads make up about 55%, while state roads account for 45% of the total length of roads in Vidzeme region. The technical condition of roads both state and municipal roads is generally unsatisfactory. About only 20% of all roads of Vidzeme region are covered with asphalt.

The number of cars per 1000 inhabitants (motorization rate) in Vidzeme region has increased from 332 units in 2010 to 378 units in 2015. The annual average daily car traffic intensity has increased over the last five years on both state and regional roads. There is a slight increase in the share of cargo vehicles in the total car traffic on state roads.

Passenger transport

Motorisation rate - number of passenger cars/1 000 inhabitants	378	
Regional energy consumption of passenger transport in the region	584	GWh

Freight transport

Regional energy consumption of road freight transport	441	GWh

Use of alternative fuels

Since 2010, the number of cars using LPG has increased, and now they account for about 7% of the total number of passenger cars.

To ensure efficient growth of the share of RES in the transport sector, the mandatory 4.5-5% volume of bioethanol mix for the gasoline of "95" trademark and mandatory 4.5-5% volume of biodiesel mix for the diesel fuel were introduced as from October 1, 2009 according to Regulations of the Cabinet of Ministers No.648.

Regarding electric vehicles, Latvia, due to active participation in the GHG emissions trading mechanism, had the revenues from the sale of GHG emissions under procedures pursuant to Article 17 of the UNFCCC Kyoto Protocol. Part of these revenues had been allocated as the national Climate Change Financial Instrument (CCFI) programme for CO_2 emissions reduction in transport sector by supporting acquisition of new electric vehicles (EV) and installation of EV charging infrastructure. As a result of this programme, in the whole Latvia it had been co-financed purchase of 174 EV and installation of more than 10 publicly available charging stations, in Vidzeme region charging stations are located in Gulbene and Ērgļi.

To further promote use of electric vehicles in Latvia, development of national wide EV charging infrastructure is supported within the framework of the national Operational Programme *"Growth and Employment 2014-2020", the particular measure co-financed by ERDF*. It is planned to reach at the end of 2023 the number of 150 EV charging pints (direct current fast charging stations with capacity at least 50 kW).

Other relevant sectors (delete if not relevant)

Regional final energy consumption of agriculture and forestry	433	GWh

Since agriculture accounts for about 15% of the value added of Vidzeme region, the sector is an important energy consumer. Most of the energy consumption in agriculture consists of diesel fuel.

8. Summary

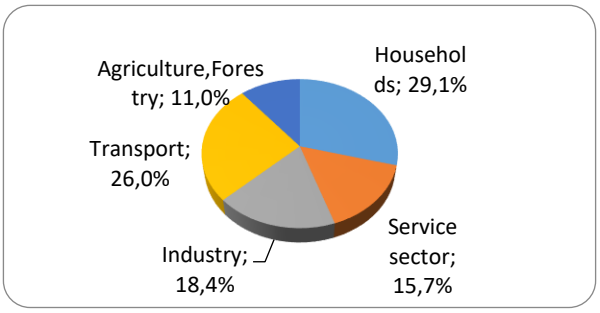
8.1. Final energy indicators

General indicators for the region

Total final energy consumption	3950	GWh
Final energy consumption per capita	20152	kWh/cap
Electricity consumption per capita	3737	kWh/cap
Heat consumption per capita	9744	kWh/cap
% of total country consumption	9	%

Final energy consumption per sector

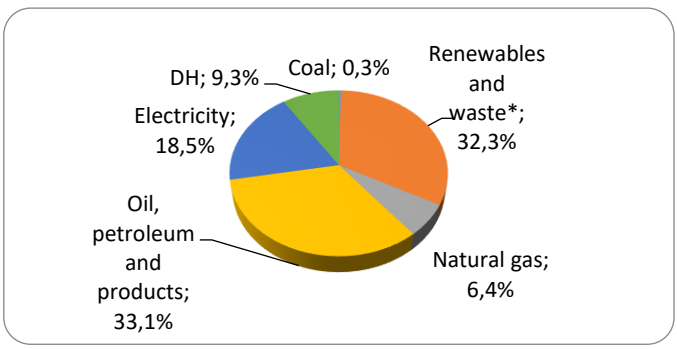
Year 2015			%
Households	1147.85	GWh	29.1%
Service sector	619.00	GWh	15.7%
Industry	725.00	GWh	18.4%
Transport	1025.00	GWh	26.0%
Agriculture,Forestry	433.00	GWh	11.0%
Sum	**3949.85**	**GWh**	



8.2. Final energy consumption by fuel

Total final energy consumption by fuel

Year 2015			%
Coal and lignite	13.58	GWh	0.3%
Renewables and waste*	1275.77	GWh	32.3%
Natural gas	254.50	GWh	6.4%
Oil, petroleum and products	1307.59	GWh	33.1%
Electricity	732.37	GWh	18.5%
DH	366.04	GWh	9.3%



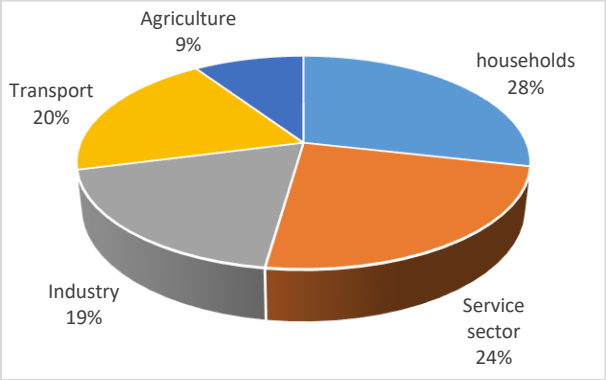
Sum	**3949.85**	**GWh**

**Hydro, wind, solar, tide/wave, biomass and waste, geothermal*

8.3. Primary energy equivalent

Total Primary Energy Consumption	5213	GWh
Primary energy consumption per capita	26595	kWh/cap
Primary energy factor of electricity	2.5	-
Energy intensity	3270	TPES/GDP kWh/1000EUR

Primary energy equivalent by sector



Year: 2015			%
Households	1487.5	GWh	28.5%
Service sector	1236.3	GWh	23.7%
Industry	975.2	GWh	18.7%
Transport	1025.0	GWh	19.7%
Agriculture	488.6	GWh	9.4%
Sum	**5212.6**	**GWh**	**100%**

Dependency on fuel imports: average

If we analyse only the supply of primary energy in Vidzeme region, then we can conclude that the RES total supply provides almost 50%. It consists of solid, gaseous and liquid biomass, hydro and sun. Wood fuel (solid biomass) accounts for about 85% of the total RES in Vidzeme region.

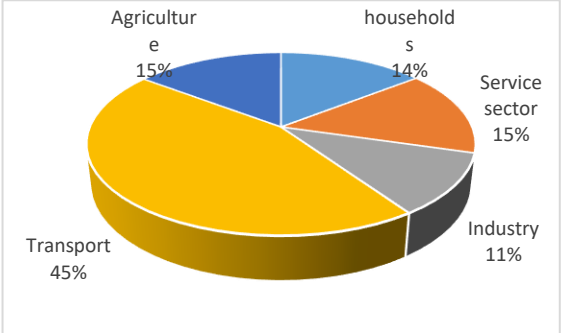
Around 50% of primary resources are imported internationally. Mainly it is gasoline, diesel oil for transport sector and natural gas.

8.4. Regional CO_2-emissions associated with energy consumption

Total CO2-emission associated with energy sector	0.58	Mio t
CO2-emissions per capita	2.94	t/cap
CO2-emissions per GDP	0.36	t CO2/1000€ GDP

Energy-related CO_2-emissions by sector

Year: 2015			%
Households	83183	t CO_2	14.4%
Service sector	86808	t CO_2	15.1%
Industry	62732	t CO_2	10.9%
Transport	258440	t CO_2	44.9%
Agriculture, Fishing and Other	84709	t CO_2	14.7%
Sum	**575872**	t CO_2	**100,0 %**



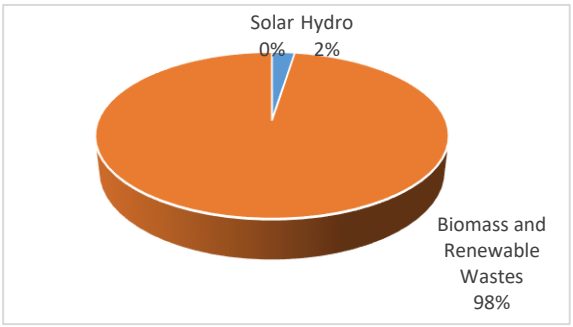
9. Renewable energy sources – status and potential

9.1. General information

Renewable Energy Targets:		
2020 RES share in gross final energy consumption	40	%
2030 RES share in gross final energy consumption	50	%
Current RES share (2015)	36.7	%
thereof RES out of the region	36.7	%

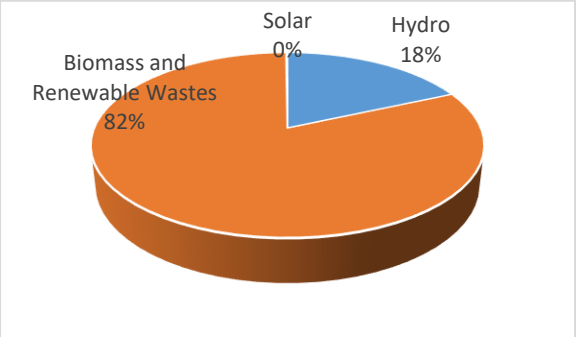
Share of final energy consumption produced by renewable fuels

Year: 2015			**%**
Hydro	32.7	GWh	2.5%
Wind	0	GWh	0%
Biomass, biofuels and renewable wastes	1275	GWh	97.5%
Solar	0.3	GWh	0.02%
Geothermal	0	GWh	0.0%
Tide, Wave, Ocean	0	GWh	0.0%
Sum	**1308**	**GWh**	**100,0 %**



Share of total electric demand covered by renewable fuels

Year: 2015			%
Hydro	32.4	GWh	18.4%
Wind	0	GWh	0%
Biomass, biofuels and renewable wastes	143.8	GWh	81.5%
Solar	0.3	GWh	0.1%
Geothermal	0	GWh	0.0%
Tide, Wave, Ocean	0	GWh	0.0%
Sum	**176.5**	**GWh**	**100,0 %**



Funding of EU projects

Source of funding	%	Comments
Private investors/ project developers	40	
Regional funding		
National funding	30	Grant and FIT
EU funds (e.g. EFRE)	30	
	100 %	

Integration of RES in the transport sector

Since Autumn 2009 the main instrument for biofuels integration in the road transport sector is the **Biofuels Blending Mandate**. In 01 October 2009 in Latvia it had been introduced the Biofuel Mix mandatory Obligation:

1. 4.5-5% (volume) bioethanol mix is mandatory for the unlead gasoline of „95" trademark. Exemptions are made for gasoline utilised in cars participating in sport competitions.
2. 4.5 – 5% (volume) biodiesel mix is mandatory for the diesel fuel, including diesels of A-F categories utilised in moderate climate conditions. Exemptions are made for diesels of 0.,1.,2.,3. and 4. classes utilised in case of arctic/winter climate.

Regarding electric vehicles, Latvia, due to active participation in the GHG emissions trading mechanism, had the revenues from the sale of GHG emissions under procedures pursuant to Article 17 of the UNFCCC Kyoto Protocol. Part of these revenues had been allocated as the national Climate Change Financial Instrument (CCFI) programme for CO2 emissions reduction in transport sector

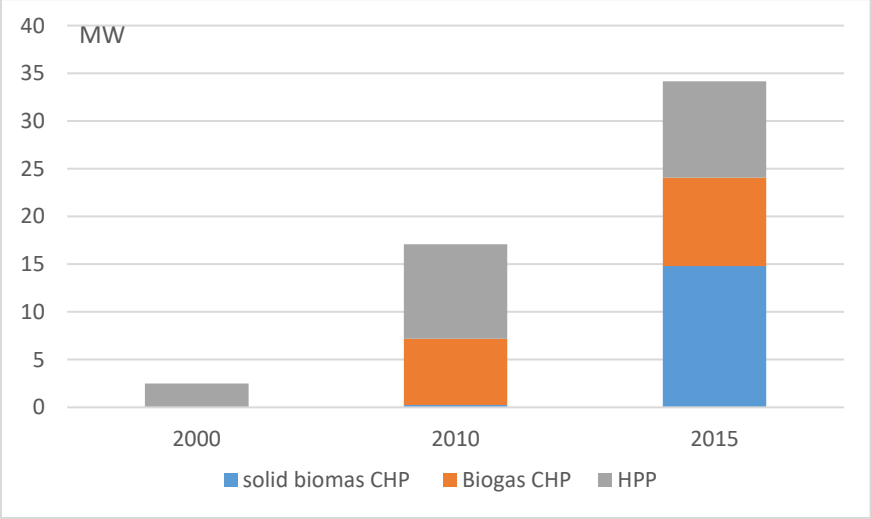
by supporting acquisition of new electric vehicles (EV) and installation of EV charging infrastructure. As a result of this programme, in the whole Latvia it had been co-financed purchase of 174 EV and installation of more than 10 publicly available charging stations, in Vidzeme region charging stations are located in Gulbene and Ērgļi.

To further promote use of electric vehicles in Latvia, development of national wide EV charging infrastructure is supported within the framework of the national Operational Programme "Growth and Employment 2014-2020", the particular measure co-finansed by ERDF. It is planned to reach at the end of 2023 the number of 150 EV charging pints (direct current fast charging stations with capacity at least 50 kW).

REN production in the region

If we analyse only the supply of primary energy in Vidzeme region, then we can conclude that the RES total supply provides almost 50%. It consists of solid, gaseous and liquid biomass, hydro and sun. Wood fuel (solid biomass) accounts for about 85% of the total RES in Vidzeme region.

RES electricity production in the Vidzeme region started to develop after 2000. If until that time only small HPPs were installed, then by 2010 the biogas CHP were already producing electricity. After 2010, most of the installed RES power plants were biomass CHP.



Development of RES electricity capacities in Vidzeme region

Despite the development of RES power stations over the last ten years in Vidzeme region, their electricity production in 2015 covered about 23% of electricity consumption.

National level investment support programmes:

- Programme for Renewable Energy Technologies in Households (national Climate Change Financial Instrument, 2011-2012),
- Investments in Renewable Technologies for Heat and Electricity Production to Reduce GHG emissions (national Climate Change Financial Instrument, 2010-2015, both public and private sector, 2010-2012)
- Investments in Complex Solutions for GHG emissions reduction (national Climate Change Financial Instrument, 2010-2015, both public and private sector),
- Investments to Produce Energy from Biomass of Agriculture and Forestry Origin: 2007-2013 EU Funds programming period, planned to be continued in 2014-2020 programming period as well
- „Measures to increase the efficiency of district heating systems" – EU Cohesion fund co-financed, 2007-2013 programming period, development of effective biomass utilising heat production units, continued in 2014-2020 programming period as well
- „Development of combined heat-power plants utilising renewable energy sources" – EU Cohesion Fund co-financed, 2007-2013 programming period, development of biomass utilising CHP units.

Feed-in tariffs

The feed-in tariffs for renewable electricity in Latvia were introduced in the year 1996. Thereafter the principles of determining and calculation of feed-in tariff were changed several times. However, currently there is no feed-in/feed-in premium support scheme for new RES power plants in Latvia.

Starting from 26th May 2011, according to the adopted Amendments of legislative documents, Ministry of Economics did not organize tenders for the acquisition of the right to sell electricity produced in biomass, biogas, solar or wind power plants within the scope of mandatory procurement. Thus, for the time being the preferential feed-in tariff is continuing only in relation to the existing RES units which had obtained the mentioned rights before noted amendments had come into force.

Regulatory barriers slowing down current and future REN-development.

There still exist regulatory, economic, social and technology barriers in Latvia for RES development. One of the main barriers today in Latvia concerning RES development is absent of a clear Government vision and targets concerning RES development to 2030. It is lack of stability and predictability of legislative basis for RES development. For wind energy development spatial planning is important issue. Latvia current spatial planning regulation does not provide establishment of wind parks with large installed capacity. Namely, there is too

drastic regulations regarding the distances of the placement of wind parks which do not allow to construct such wind parks. In case of rooftop solar panels in densely populated cities, it can be difficult to change already adopted spatial plans in order to achieve the highest solar power productivity which depends on the orientation of panels. For consumers the purchase price of Electric vehicles is still high, although rapid technological development has taken place and battery costs are falling. Another concern for them is the electric range of driving an EV. For a country, technology shift is a capital intensive: building charging stations of a sufficient density and an additional electricity grid (or strengthening the existing grid) which would support the higher demand for electricity.

9.2. Available natural resources in the region

9.2.1. Biomass

The forestry sector, including wood processing, is one of the most important fields for the economic development in Latvia, therefore, the objectives of VPR and the national policy are equal. They focus on the sustainable management of forests, increase of products with a high added value, thus ensuring competitiveness of Latvia.

The issue of an efficient use of wood is still topical. It needs a complex solution. A lot of bushes grow along ditches and deserted fields and they could become a very good raw material for energy wood. It often happens that before incineration wood is not dried till its moisture content reduces up to 25-30%.

It is essential to elaborate a concept of using wood with a maximum added value. On the regional level, the added value can be generated by such activities as instalment of modern wood processing technologies and establishment of new factories that would allow using by-products as a high-quality energy wood. The economic development of the region can also be promoted by creating an investor-friendly environment and enhancing education of the society and positive attitude.

Another solution that still needs a feasibility study is the establishment of an energy wood stock exchange with co-ordinated transport logistics and a fuel storehouse, if necessary.

The municipalities where forests cover the largest part of their territories, could promote their development with the help of the following activities:

- Co-operation with private forest owners to ensure the sustainable development;
- The Latvian State Forests (LSF) sell energy wood up to 50 metres from the road, i.e., they sell only the wood that is located up to 50 m from the road. The municipalities could make an agreement with LSF to find economically better solutions and go further inside.

Main agricultural products, regional energy potential from agricultural products

State Priekuli Plant Breeding Institute located in Vidzeme Planning Region is one of the most experienced agricultural research institutions in the Baltic Sea region. Agricultural crops researched by SPPBI are: cereal (barley, rye, and triticale), potato, legumes and annual and perennial grasses. The main research areas: plant breeding, maintenance and preservation of plant genetic resources seed production, crop management for environmentally friendly, especially organic, farming systems. The Institute provides fundamental and applied research, promotes and carries postgraduate studies, and provides advising and consultancy on products (crop varieties, seeds) and technologies for organic, integrated and conventional agricultural holdings (large, medium and small enterprises). Research for environmentally friendly, especially organic, farming systems was intensified and extended at the beginning of the 21st century, when the Institute concentrated efforts on creation of new field crop varieties and seed production and on development of breeding and growing technologies for environmentally friendly, especially organic, production systems.

Land use map or map indicating biomass energy potential of the region

Please see information in the Corine Land Cover 2012 database:
http://land.copernicus.eu/pan-european/corine-land-cover/clc-2012/view

9.2.2. Hydro power (incl. tide and wave power)

On 2015 there was 146 small run-of-river hydropower plants actively operating in Latvia. Total share of electricity produced by hydropower plants from 2005-2014. was 0,9%. There are 43 small run-of-river hydropower plants located on different rivers in Vidzeme region. Gauja is the largest river in Vidzeme. There are 9 hydropower plants located on Gauja river.

9.2.3. Solar energy

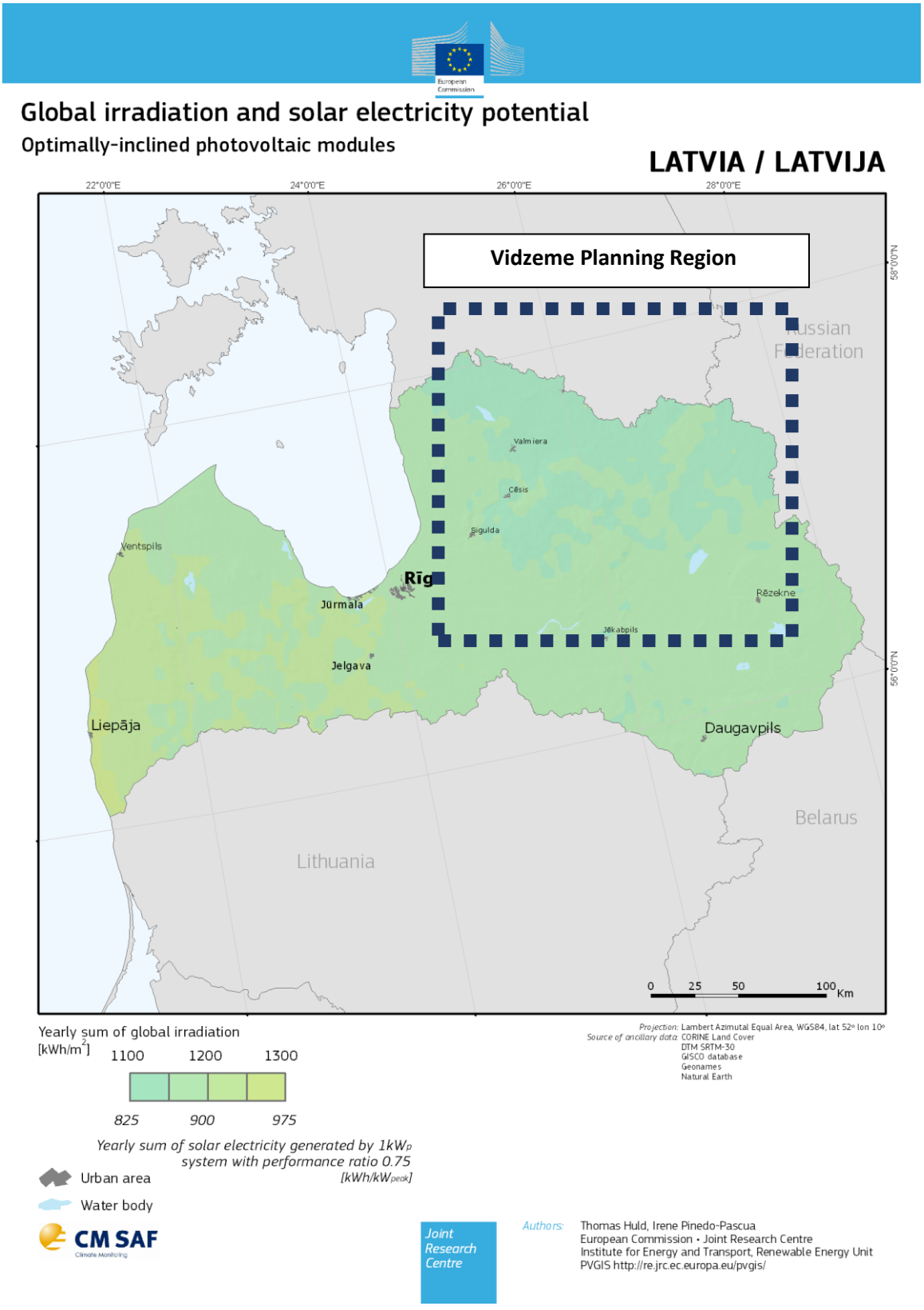
Solar irradiation (on optimally inclined plane) per year	from 1100 to 1200	kWh/m^2

Solar energy in Latvia have untapped potential, but still there is lack of awareness and trust to solar energy technologies.

In last 10 years there increase number of installed solar thermal and solar PV systems mainly due to support for renewable energy technologies, e.g. Green Investment scheme.

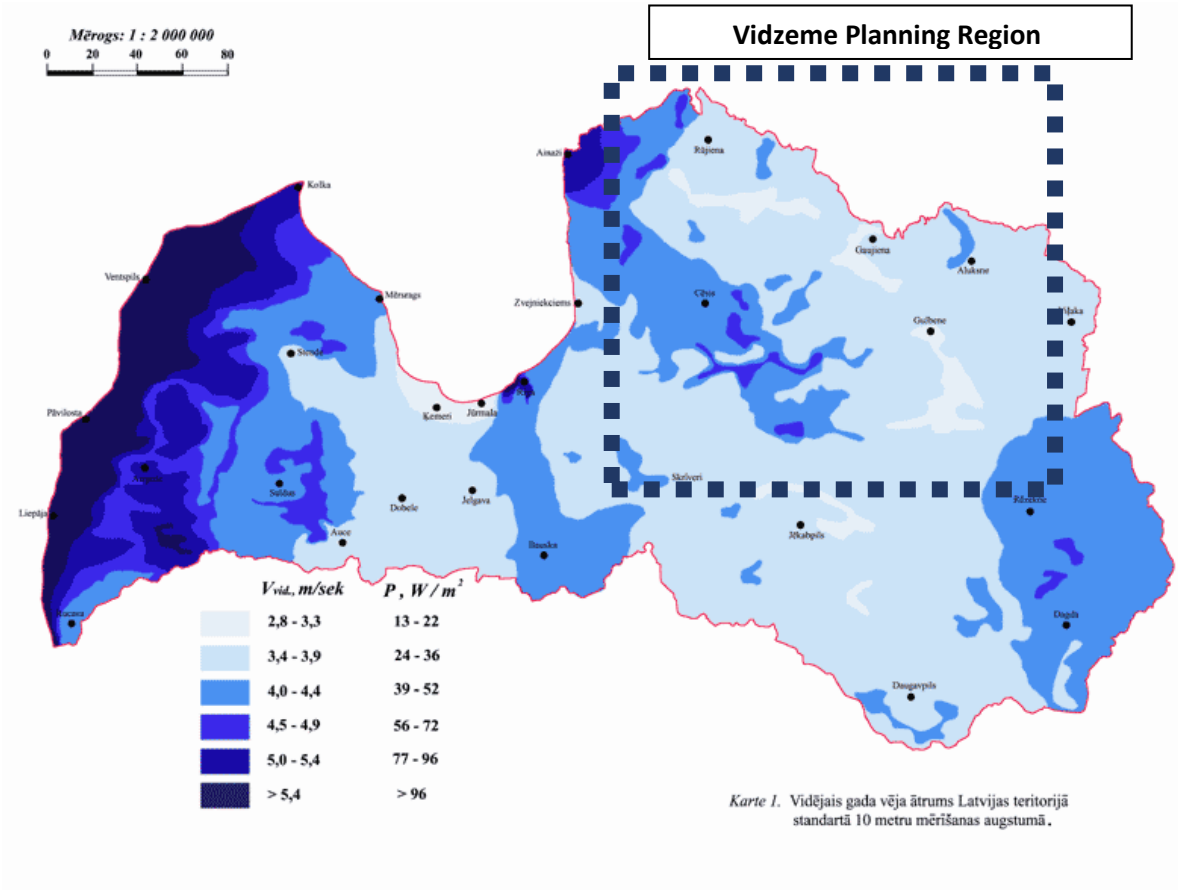
The map indicating solar irradiation in the region

You can use e.g. the interactive map or posters provided by EU JRC PV database: Photovoltaic Geographical Information System (PVGIS), http://re.jrc.ec.europa.eu/pvgis/



9.2.4. Wind power

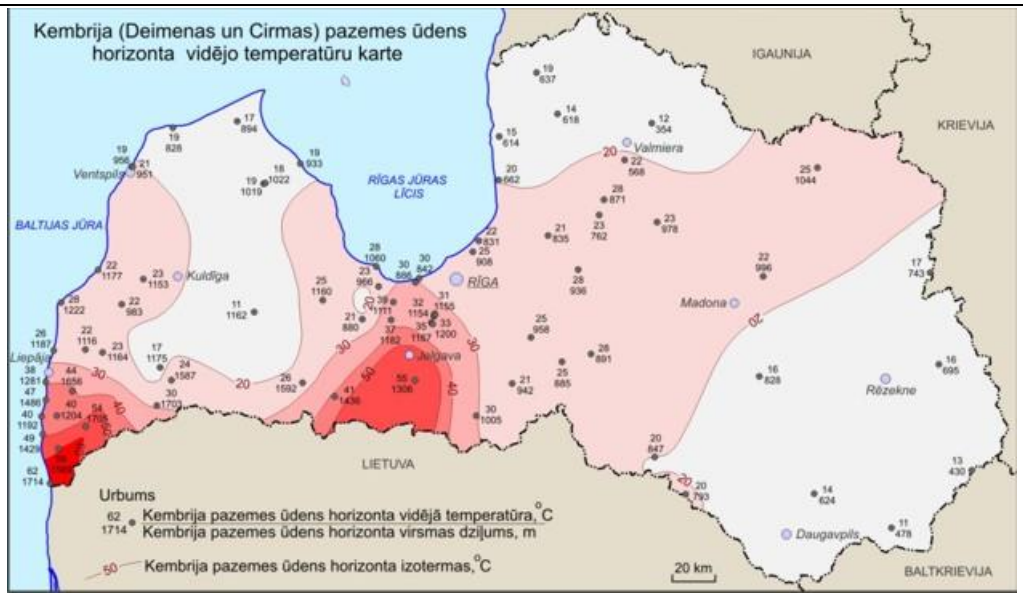
Average wind velocity on 10m height	from 2 to 6	m/s
Full load hours		h/a



http://www.windenergy.lv/uploads/img/posts/karte03_1618218539.gif

9.2.5. Geothermal energy

Potential geo-thermal aquifers lie in a depth of 300 – 2000 m (from 7 °C up to 65 °C) therefore geothermal energy is not used at the moment due to high initial investments and availability of other local and renewable energy resources, e.g. biomass.



https://www.meteo.lv/fs/CKFinderJava/userfiles/images/geologija/kembrijs%20geoterma.jpg

9.2.6. Waste

Waste management is organised on the regional level. The landfill "Daibe" owned by municipalities has provided a gas collection system in the first disposal cell – gas collection pipes almost 3 km long, a gas regulation station and a pumping station. The collected gas is currently used for generation of electricity and heating in the co-generation network – for landfill infrastructure.

9.2.7. Restriction through protected areas

There are environmentally protected areas which are not available for REN facilities, so called, NATURA 2000 area.

10. Energy efficiency – status and potential

The new "Energy Efficiency Law" which contains legal norms arising from the Directive 2012/27/EU was adopted 03 March 2016 and are in force from 29 March 2016. The Energy Efficiency Law includes the framework for the measures used for meeting the target set by Article 7 of the Directive:

- Energy Efficiency Obligation Scheme
- Energy Audits and Energy Efficiency Improvement in Large Enterprises
- Energy Management Systems (EMS) in Enterprises – Large Electricity Consumers (LEC) (national measure in addition to the framework defined by the Directive): the enterprise is considered as a LEC if its own annual electricity consumption is above 500 MWh;
- EMS in state administration institutions: it is stated mandatory implementation of EMS in those state direct administration institutions which have buildings with total heating area 10000 m2 and above, the EMS shall be implemented up to the 1st November 2017 at the latest or during one year after the noted provision came into force.
- EMS in municipalities: it is stated mandatory implementation of EMS in: (1) Latvia largest nine cities shall implement the certified (according to the standard) EMS up to 1st April 2017 at the latest, on October 2017 seven cities has implemented EMS, (2) other Latvia municipalities shall implement EMS if they have the territorial development index 0.5 and above and population above 10000 inhabitants, these EMS shall be implemented up to 1st November 2017 at the latest or during one year after the noted provisions have come into force, currently 10 Latvia municipalities have such duty. (3) other municipalities may introduce EMS voluntary, and one Latvia municipality on October 2017 has performed this voluntary implementation.

Status of the implementation of the Energy Performance of Buildings Directive

The *recast Law on the Energy Performance of Buildings*, adopted December 2012[1] in accordance with the requirements of the *Directive 2010/31/EC* and replacing the previous law with the same title, which was adopted in 2008 in accordance with the requirements of *the Directive 2002/91/EC*, recasts the general legal framework of setting the mandatory minimum energy performance requirements for buildings, recasts the general principles of mandatory energy efficiency certification for buildings, verification of buildings heating and ventilation systems, etc. It is introduced by the Cabinet of Ministers Regulations No.383 (2013) six (A-F) energy efficiency classes for residential and non-residential buildings.

[1] Law on the Energy Performance of Buildings (recast, Ēku energoefektivitātes likums), in Latvian, available at http://likumi.lv/doc.php?id=253635

Energy efficiency measures implemented in household sector

In *EU Funds planning period of 2007-2013* (implementation finished 2016) the investments in energy efficient apartment building renovation were co-financed by the EU Regional Development Fund (ERDF) in the framework of the *Latvia national Operational Programme „Infrastructure and Services"*, part *„Energy Efficiency in Housing"* (activity No.344). The programme had 2 target audiences: (1) apartment owners of multi-apartment buildings, and (2) tenants of municipal social residential buildings. It has been renovated 740 multi-apartment buildings and 55 social residential buildings. In EU Funds planning period of 2014-2020 (implementation 2017-2022 including), increasing of energy efficiency in multi-apartment buildings is supported within the framework of the Operational Programme "Growth and Employment". Beneficiaries - community of flat owners of multi-apartment buildings. Informative and technical support for multi-apartment buildings renovation are provided by the informative campaign/programme *"Let's live warmer!'* applying wide scope of methods to reach target groups of owners of apartments and apartment owners' associations, building managers, building contractors, producers and sellers of building materials. The programme's continuation is based on wide experience obtained in the previous EU Funds planning period.

Energy efficiency measures implemented in service sector

Investment Support Programmes in Public Sector Energy Efficiency had been important focus of national Climate Change Financial Instrument (CCFI) and were implemented in the period 2010-June 2015. The 8 open tenders were implemented, namely, (1) "Energy Efficiency Measures in Municipal Buildings", (2) "Complex Measures to Reduce GHG Emissions in Municipal Buildings", (3) "Energy Efficiency Measures in Higher Educational Institutions Buildings ", (4) "Complex Measures to Reduce GHG Emissions in Municipal and State Professional Educational Buildings", (5) "Complex Measures to Reduce GHG Emissions. Increasing Energy Efficiency in Municipal Buildings is supported by EU Funds planning period 2014-2020. Increasing of energy efficiency in public buildings of local governments is supported within the framework of the Operational Programme "Growth and Employment". Increasing Energy Efficiency in State (Central Government) Public Buildings will be supported under the same Programme.

Energy efficiency measures implemented in industry sector

Investment support in industrial buildings and Technologies Energy Efficiency to Reduce GHG emissions was important focus of national CCFI. Starting from 2010 until June (including) 2015 it was implemented the projects of 6 open tenders of CCFI. It was eligible energy efficiency investments of different kind both in buildings and technological equipment.

Energy efficiency measures implemented in transportation sector

Up to now there are not many economic support measures implemented in transport sector. Latvia government uses a mix of infrastructure development, regulation (normative standards, labelling, public procurement), fiscal, information & education (e.g. ecodriving) measures.

Source of funding	**%**	**Comments**
Private investors/ project developers	20	
Regional funding	5	Grant
National funding	15	Grant
EU funds (e.g. EFRE)	60	
	100 %	

11. SWOT analysis

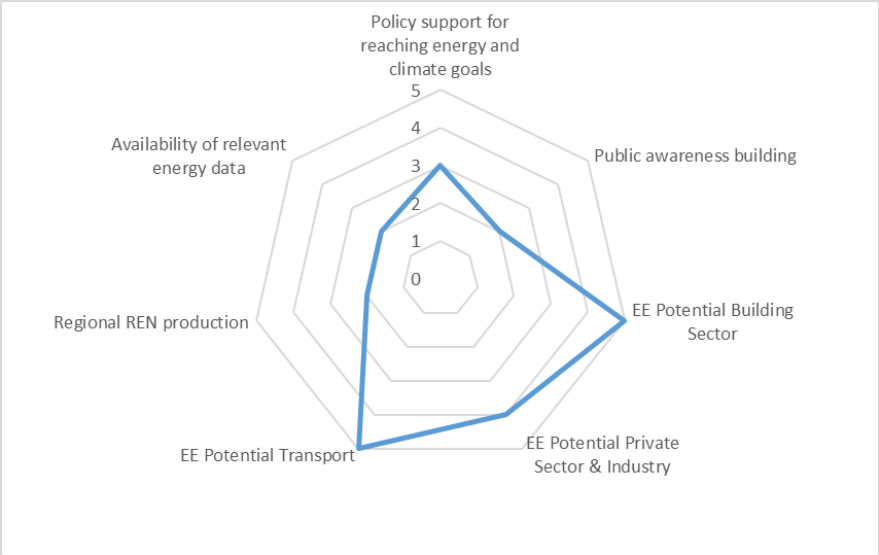
Strengths	Weaknesses
• A great potential of the renewable energy resources in VPR • Lack of the natural gas pipelines in the largest part of the VPR territory • Possibility to involve the local labour force • Sustainable forest management • Low costs of wood energy resources in comparison with the natural gas	• Lack of sustainable national policy • Lack of responsibility for the achievement of the objectives of the renewable energy resources and the energy efficiency • Shortage of professional knowledge how to prepare and use the energy wood • Lack of motivation to improve the local energy systems • Shortage of skills of an efficient use of the renewable energy resources in heat supply systems • Underdeveloped local market of biomass that can develop only then when there will be an unchangeable demand • Reliable data of the fuel consumption, produced energy and the consumption of energy in the VPR municipalities • Most of the small wood processing enterprises are not modernised and their products have a low added value • Inadequately great influence of the fossil fuel supplier, especially, the natural gas, on the use of the national policy instruments • Few possibilities to installation CHPs in the region due to lack of heat consumers • Low sensitiveness to energy saving
Opportunities	**Threats**
• Possibilities of the Latvian and Baltic „green" region – promotion of economics and wellbeing • Existence of many wood processing companies for efficient use of wood residues etc. • Many small decentralised wood log boiler houses where use of biomass can be improved • Existence of applicable funds to invest in energy system development • Need for efficient locally produced technology	• Decrease of biodiversity • Risk of energy resources price increase • Risk of state policy shift in favour of fossil fuels

Assess the following trends:

- Policy Support for reaching energy and climate goals
- Public awareness building
- EE Potential Households
- EE Potential Private Sector & Industry
- EE Potential Transport
- Regional REN production
- Availability of relevant energy data

Self-assessment:

Points:
1 … no measures set/ potential unused
to
5 … fully developed/ potential fully used



12. Annex: List of sources /bibliography /List of relevant stakeholders/institutions in the region

1. Analysis of Vidzeme Planning Region strengths and weaknesses, Ekodoma Ltd, 2011
2. Latvia Green movement in cooperation with CEE Bankwatch Network "Energy poverty in Latvia: implementation of energy efficiency activities and supporting mechanisms"
3. Data bases of the Central Statistical Bureau of Latvia (http://www.csb.gov.lv/en/about-us);
4. Ministry of Economics of the Republic of Latvia www.em.gov.lv.
5. Ministry of Environmental Protection and Regional Development of the Republic of Latvia www.varam.gov.lv.
6. www.Tentacle.eu

List of identified stakeholders

Municipality of Cēsis
Municipality of Pārgauja
Municipality of Valka
Municipality of Rūjiena
Municipality of Smiltene
Municipality of Rauna
Municipality of Strenči
Municipality of Beverīna
Municipality of Valmiera
Vidzeme Hospital/ Valmiera
Municipality of Ape
Municipality of Alūksne
Municipality of Gulbene
Municipality of Jaunpiebalga
Municipality of Amata
Municipality of Burtnieki
Municipality of Kocēni
Municipality of Cesvaine
Municipality of Lubāna