

# REGIONAL ENERGY PROFILE

Region: Podravje  
English version

by  
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PANEL 2050 – Partnership for New Energy Leadership 2050  
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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 region of Podravje, 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:

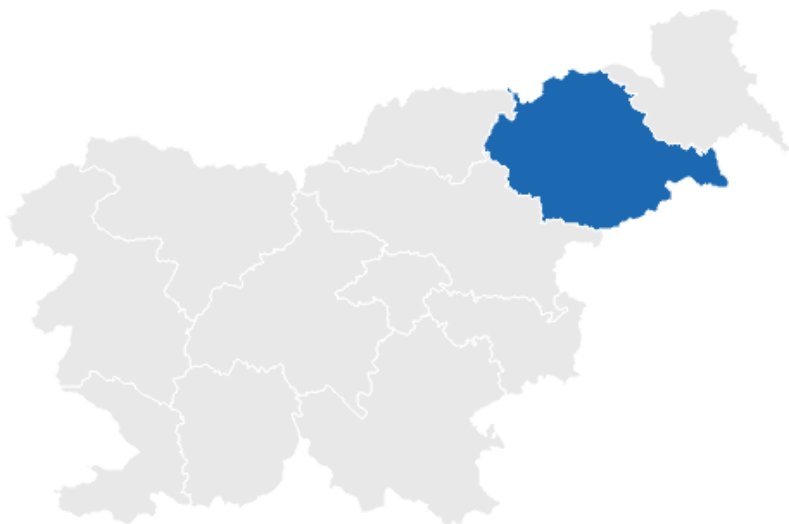
- Republic of Slovenia Statistical Office: <http://pxweb.stat.si/pxweb/dialog/statfile1.asp>
- Republic of Slovenia Ministry for Infrastructure – Energy Portal: <http://www.energetika-portal.si/>
- Republic of Slovenia ministry of the Environment and Spatial planning – Slovenian Environment Agency (ARSO): <http://www.arso.gov.si/en/>



## 2. General introduction of the region

**Podravje region** – NUTS-3 level, East Slovenia – NUTS-2 level

### *Geography and policy:*



REPUBLIKA SLOVENIJA  
STATISTIČNI URAD

Podravje region is located in the northeast of Slovenia, between the regions Carinthia, Savinja and Mura. In the north Podravje borders with Austria and in southeast with Croatia. With 2.170 km<sup>2</sup>, Podravje represents a tenth (10,7 %) of Slovenian territory and after the size, Podravje is on fifth place among Slovenian regions.

Podravje region consists of 41 municipalities, with 322.545 inhabitants (according to year 2015) what represent 15,6 % of total population of Slovenia. The urban centre of the region is Maribor, the second largest Slovenian city that has the largest number and density of population in the region.

The natural and geographical image of Podravje region form the hills to the northeast, subalpine wooded mountains (Pohorje and Kozjak) in the west and the Drava-Ptuj plain along the Drava River. 42 % of the region is covered by forests (*Source: Records of the actual use of agricultural and forest land in 2008 and 2012. MKO, 2012*). Water wealth is harnessed to generate electricity. With eight hydroelectric power plants and three small hydroelectric power plants, the Drava River is the most important Slovenian river. With rainfall of only 900 to 1100 mm per year, Podravje region is one of the driest regions in Slovenia. The average annual temperature ranges from 8 to 12° C (*Slovenian Environment Agency*). Podravje region has the most farms compared with other regions. According to data from the Census of Agriculture in 2010, there are 80.516 hectares of farmland and 12.318 farms in use in this region.

Podravje was in the seventies one of the most developed areas with favourable development potential and possibilities for further development. In the eighties began the development lag of the region. This was reflected in a decline in economic activity, accumulation and investment activities, which

prevented the modernization and development. Dominated by large companies (especially in the field of metal processing and textile industries), the tertiary sector was underdeveloped. Large companies first felt the crisis of the political, economic and social changes and the gradual transition to a market economy. The growth in employment occurred in 1997, as a result of the increase in economic activity. The largest project related to energy in the Podravje region is undoubtedly the construction of the Drava power plants. A closed chain of 8 power plants on the Drava River was built in the period from 1918 until 1978.

At the national level, Slovenia designed and adopted key documents governing the energy sector. The Energy Act (EZ-1) brings in the Slovenian legislation the provisions of ten European directives regulating the energy market, the promotion of energy efficiency, renewable energy sources and the supervision and regulation of the market. Strategic documents at the national level in the field of energy are as follows:

- Energy concept of Slovenia (under construction);
- National Energy Efficiency Action Plan 2014-2020;
- National Renewable Energy Action Plan 2010-2020;
- National Action Plan for the nearly zero-energy buildings for the period up to 2020;
- Long-Term Strategy for Mobilising Investments in the ENERGY RENOVATION OF BUILDINGS;
- Operational Programme for the implementation of the EU cohesion policy in the period 2014-2020;
- Operational program of measures to reduce greenhouse gas emissions by 2020;

At the regional level, there are regional development programs, but those programs does not define the energy sector in detail.

At the local level, municipalities have formulated local energy concepts, which serve as a guide for energy development of communities. Another document in the energy sector at the local level is SEAP, which is in Podravje so far adopted only by the municipality of Maribor.

Energy targets of Podravje and other Slovenian regions are directed to the achievement of the national goals set in the field of energy. As a region, Podravje has no regional energy concepts, so the energy targets and strategies are set only on a national and local level. The objectives on a local level vary depending on the resources available, so natural, as well as economic.

### 3. Basic demographic data and figures

#### *Regional demographic indicators:*

Population of region	322.545	cap
Area of region	2.170	km <sup>2</sup>
Population density	148,6	cap/km <sup>2</sup>
Number of individual municipalities	41	mun.

Data from 2015

#### *Basic demographic data*

In 2015, in the Podravje region lived 15,6 % of the population of Slovenia. The proportion of the population aged 0 - 14 years of age, has been in the region one of the lowest (13,5 %). The region's population has increased since 2002 for about 3,8 %. The percentage of deaths before the age of 65 in

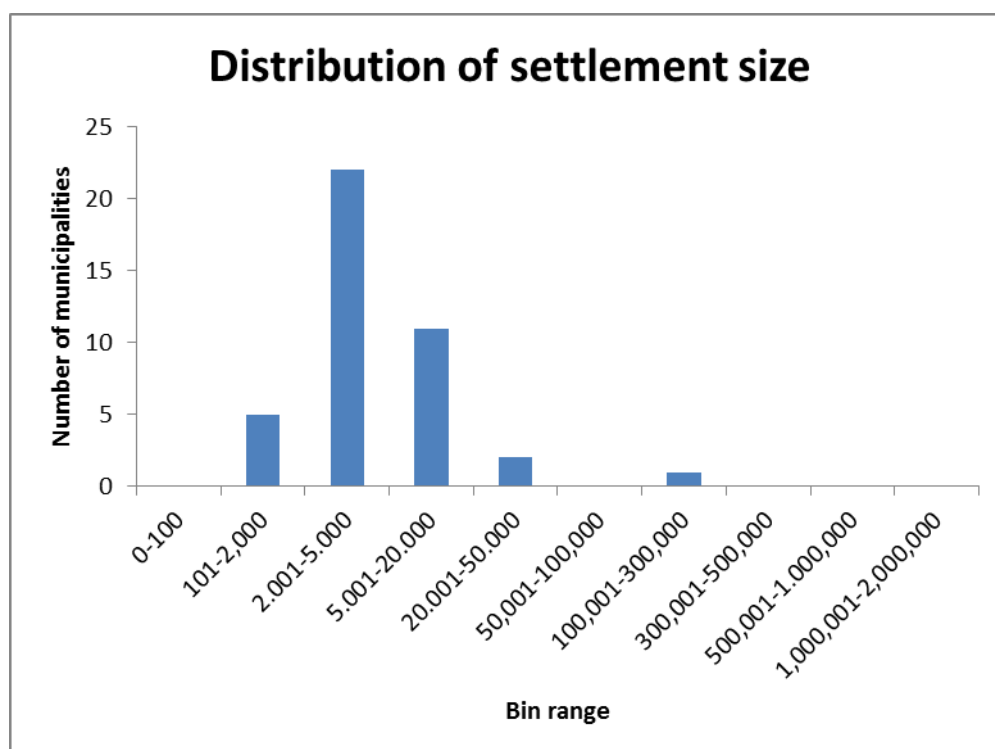
the year 2015 has been the second highest in Slovenia (18,7 %). Around 69 % of students who live in Podravje are studying in their home region, while in the central region are studying 20,69 %.

#### *Socio-economic development of past 3-5 years*

Unemployment rate	13,6	%
Average annual income per capita (gross)	17.043,60	EUR
difference from the EU average (34.500 EUR gross annual earning)	49,40	%
Share of employees in		
agriculture	0,8	%
industry	35,8	%
services	63,4	%
Share of population with tertiary education	16,83	%

The registered unemployment rate in the region (13,6 %) is higher than the average in Slovenia (12,3 %). From 2005 on, the number increased less among all regions, only by 0,1 percentage points. The average annual gross income per capita in the region amounted to 17.043,60 EUR, which is less than the Slovenian average. The largest share of employment in the region is resulting from the service sector. The share of population with tertiary education is 16,83 %.

Population density in the region in 2015 amounted to 148,6 residents/km<sup>2</sup>, which is above the Slovenian average (101,8 residents/km<sup>2</sup>) and Podravje ranks second among Slovenian regions.



## 4. Regional economy and economic trends

### Regional economic indicators:

GDP, total	4.986	million EUR
GDP per capita	15.456	EUR/cap
HDI*	0,917	

Data from 2015

\*HDI is provided for whole Slovenia

### GDP per economic sectors:

Agriculture	2,6	% of total GDP
Industry	33,6	%
Services	63,8	%

Data from 2015

### Regional economy



Regional development has been in the years 2007-2013 strongly affected by the global economic crisis, which has after 2008 decreased the progress in economic and social development of the region. Number of enterprises in the 2008-2014 period has grown slightly, but led to a sharp reduction in employment because of the collapse of a number of medium-sized enterprises, mainly in construction sector.

number of operating entrepreneurs (SMEs, large and individual)	<b>25.873</b>	
→ share of SMEs	5,0	% of total number of operating businesses
number of operating nonprofit organisations	/	
Amount of EU funds (2007-13)	/	EUR

Companies in the manufacturing sector have created the largest share (26,8 %) of total revenues in Podravje in the year 2015. Construction sector represented 6,3 % and agriculture 2,6 % of total revenues in Podravje. The manufacturing sector was the driving force, which has paved the way out of the crisis in Podravje and whole Slovenia. After the beginning of the crisis in 2008, the construction sector has suffered serious consequences, but in last years, the construction sector began to strengthen again and with new investments it is expected, that this trend will continue.

Following the rapid growth of unemployment in the early years of the crisis, the growth after 2010 slowed down. At the end of 2011, the Slovenian economy again took a crisis that was escalating in 2013 and peaked in early 2014. In the following months, the unemployment rate began to decline, but the average unemployment was still higher than the previous year. In the years 2015 and 2016, the number of registered unemployed decreased significantly, mainly due to the expected economic growth and employment.

In 2012 in the Podravje region, agriculture sector represented 6,02 %, non-agricultural sectors 32,00 % and services 61,98 % of all employees.

In the past years, the exports from the Podravje region increased constantly, which had a crucial role in economic recovery in the 25 years of independence. Economy in Podravje and the wider economy of Slovenia are highly dependent on international trade. The ratio of trade (imports and exports) to GDP is one of the highest in the south-eastern part of the EU. External trade accounts for almost 150 % of GDP (68,5 % - imports and 77,8 % - exports).



## 5. National and local energy strategies

Region	Brief description of current situation on national, regional and local level in the field of energy planning including fulfillment of EU directives (mainly Directive 2012/27/EU on EE, Directive 2010/31/EU on energy performance of buildings, National Energy Efficiency Action Plans, NREAP, etc.)	legal requirement OR voluntary initiative	List of relevant strategies / policies / roadmaps / action plans / implementation plans / activities								Notes
			National level (NUTS I)				Local level (municipalities / microregions, etc.)				
			Original title + link (if possible)	English title + brief description	Organisation in charge	Type (EE, EPB, RES, etc. or combination ...)	Original title + link (if possible)	English title + brief description	Organisation in charge	Type (EE, EPB, RES, etc. or combination ...)	

Podravje	<p>In accordance with the requirements of the Energy Efficiency Directive (2012/27 / EU), Slovenia has set a national target of reducing total energy consumption by 20% by 2020. This target is that primary energy consumption in 2020 will not exceed 7.125 million toe (82, 86 TWh). This means that compared to the year 2012 the consumption will not increase by more than 2%.</p> <p>To achieve the headline target of energy efficiency a quarter of the existing building stock must be energy renovated by 2020, which represents around 22 million m<sup>2</sup> of building surfaces. With this, the energy use in buildings would be decrease by almost 10%. In particular, energy renovation of buildings (sustainable construction) is a governmental</p>	Legal requirement	<p>AKCIJSKI NAČRT ZA ENERGETSKO UČINKOVITOST ZA OBDOBJE 2014–2020 (AN URE 2020) Link: <a href="http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_ure/an_ure_2020_sprejet_maj_2015.pdf">http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_ure/an_ure_2020_sprejet_maj_2015.pdf</a></p>	<p>NATIONAL ENERGY EFFICIENCY ACTION PLAN 2014–2020</p> <p>In this National Energy Efficiency Action Plan 2014–2020, Slovenia sets its national target to improve energy efficiency by 20 % by 2020, in line with the requirements set out in Directive 2012/27/EU (Energy Efficiency Directive). This target states that primary energy consumption will not exceed 7.125 million toe in 2020, meaning that it may not exceed the 2012 figure by more than 2 %.</p> <p>Link: <a href="https://ec.europa.eu/energy/sites/ener/files/documents/NEAPSLOVENIA_en.pdf">https://ec.europa.eu/energy/sites/ener/files/documents/NEAPSLOVENIA_en.pdf</a></p>	<p>Ministrstvo za infrastrukturo</p> <p>Ministry of Infrastructure</p>	EE	<p>Lokalni energetski koncept Mestne občine Ptuj Link: <a href="http://www.ptuj.si/API/download.php?fid=6328">www.ptuj.si/API/download.php?fid=6328</a></p>	<p>Local energy concept of Ptuj</p> <p>The energy concept of the local community enables long-term planned development of the municipality in the energy and energy-related environmental development. It means not only a decisive step towards the preparation, but also the basis for the formation and implementation of appropriate environmental and energy policies. Local energy concept is therefore a document that the municipality and its inhabitants directs to systematic creation and maintenance of databases on planned investments, consumers and energy, facilitates and promotes energy reconstruction, low-energy and passive construction, careful management of energy, introduction of energy efficiency measures energy, raising energy efficiency and introduction of renewable energy sources.</p>	Municipality Ptuj	EE, RES	<p>Since Slovenia is a small country, we don't have any strategies, policies, activities on regional level associated with energy.</p>
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Spodnje Podravje	<p>strategic project no. 1. Our aim is to take action and prepare a funding model in which Slovenia will increase the share of energy renovated public and private buildings.</p> <p>Based on European and national legislation, the Government adopted a "long-term strategy to promote investments in energy renovation of buildings". The strategy provides the following operational objectives by 2020 or 2030:</p> <ul style="list-style-type: none"> <li>• renovate 3% of public buildings annually,</li> <li>• renovation of 1.8 million m2 of buildings in the wider public sector in the period 2014-2023,</li> <li>• improve the relationship between the invested public funds and investments in the public sector to 1: 3,</li> <li>• Implementation of 5 demonstration projects of different types of energy renovation of buildings.</li> </ul> <p>Expected result is the renovation of 9.1</p>	Legal requirement	<p>Dolgoročna strategija za spodbujanje naložb</p> <p>ENERGETSKE PRENOVE STAVB</p> <p>Link: <a href="http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/dseps/dseps_final_okt2015.pdf">http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/dseps/dseps_final_okt2015.pdf</a></p>	<p>Long-Term Strategy for Mobilising Investments in the ENERGY RENOVATION OF BUILDINGS</p> <p>The existing building stock is the sector providing the greatest potential for achieving energy savings, as buildings account for just over one third of all energy consumed. Buildings are also key to achieving the target of an 80–95 % reduction in greenhouse gas emissions by 2050. The Energy Efficiency Directive therefore lays down that Member States should establish a long-term strategy for mobilising investments in the renovation of the national building stock in order to increase the rate of building renovation. The strategic objective of this document is to achieve carbon-neutral energy use in buildings by 2050. This will be achieved by making considerable improvements in energy performance and by increasing the use of renewable energy sources in buildings. This will, in turn, significantly reduce emissions of other harmful substances into the atmosphere. A further objective is for Slovenia to become recognised for its activities in the field of sustainable construction.</p> <p>Link: <a href="https://ec.europa.eu/energy/sites/ener/files/documents/Building%20Strategy%20Slovenia_EN.pdf">https://ec.europa.eu/energy/sites/ener/files/documents/Building%20Strategy%20Slovenia_EN.pdf</a></p>	Ministrstvo za infrastrukturo  Ministry of Infrastructure	Lokalni energetski koncepti za vse občine v regiji Spodnje Podravje	Local energy concepts for all Municipalities in the Spodnje Podravje region	Municipalities of the Spodnje Podravje Region	EE, RES	
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	million m2 of buildings, of which: • 6 million m2 of residential buildings, • 1.8 million m2 of public buildings (including the required annual renovation of 3% of the buildings in the narrow public sector) • 1.3 million m2 of buildings in the private service sector in the period 2014-2023.									
Spodnje Podravje		Legal requirement	Akcijski načrt za skoraj nič-energijske stavbe za obdobje do leta 2020 (AN sNES) Link: <a href="http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_snes/ansnes_final_apr_2015.pdf">http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_snes/ansnes_final_apr_2015.pdf</a>	Action plan for nearly zero-energy buildings  Action plan for the nearly zero-energy buildings include the objectives, programs, and measures for achieving these objectives, as well as human and financial resources to implement these programs and measures. In this plan, the government sets up policies and measures to boost the energy efficiency of existing buildings into nearly zero energy.	Ministrstvo za infrastrukturo  Ministry of Infrastructure	EE, RES				
Spodnje Podravje		Legal requirement	AKCIJSKI NAČRT ZA OBNOVLJIVE VIRE ENERGIJE ZA OBDOBJE 2010-2020 (AN OVE) Link: <a href="http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_ove/an_ove_2010-2020_final.pdf">http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_ove/an_ove_2010-2020_final.pdf</a>	NATIONAL RENEWABLE ENERGY ACTION PLAN 2010-2020 (NREAP)  The objective of the NREAP is to assess and determine the necessary quantitative values of energy consumption from RES by individual sector (heating and cooling, electricity and transport) and to propose measures to facilitate consumption of the desired quantity of energy from RES in future years. Link: <a href="http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_ove/an-ove_eng.pdf">http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an_ove/an-ove_eng.pdf</a>	Ministrstvo za infrastrukturo  Ministry of Infrastructure	RES				

Spodnje Podravje		Legal requirement	Pravilnik o učinkoviti rabi energije v stavbah PURES-2 Link: <a href="http://www.pisrs.si/Pis.web/pregledPredpisa?id=PAV10043">http://www.pisrs.si/Pis.web/pregledPredpisa?id=PAV10043</a>	Rules on efficient use of energy in buildings  This policy sets out the technical requirements that must be met for efficient use of energy in buildings in the area of thermal insulation, heating, cooling, ventilation, hot water preparation and lighting in buildings, providing their own renewable energy sources for technical systems in the building and the methodology for calculating the energy performance of buildings in accordance with Directive 2010/31/EU	Ministrstvo za infrastrukturo  Ministry of Infrastructure	EE, RES						
Spodnje Podravje		Legal requirement	Pravilnik o metodologiji za izdelavo in vsebini energetskega pregleda Link: <a href="http://www.pisrs.si/Pis.web/pregledPredpisa?id=PAV11911">http://www.pisrs.si/Pis.web/pregledPredpisa?id=PAV11911</a>	Rules on the methodology for the production and content of the energy audit  This policy sets out the methodology for producing, minimum requirements and the mandatory contents of an energy audit of buildings, processes and transport end-customers.	Ministrstvo za infrastrukturo  Ministry of Infrastructure	EE						
Spodnje Podravje		Legal requirement	Pravilnik o prezračevanju in klimatizaciji stavb Link: <a href="http://www.pisrs.si/Pis.web/pregledPredpisa?id=PAV4223">http://www.pisrs.si/Pis.web/pregledPredpisa?id=PAV4223</a>	Rules on the ventilation and cooling of buildings  This policy specifies the technical requirements for ventilation and air conditioning of buildings and technical requirements for mechanical ventilation systems, if they are installed in the building.	Ministrstvo za infrastrukturo  Ministry of Infrastructure	EE						



 **European  
Commission** | Horizon 2020  
European Union funding  
for Research & Innovation

[illegible]

## 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 <sub>2</sub> - emissions in t	Utilization rate (qualitative assessment)
	[choose: Public / private SME / private large enterprise]			[state: electr. and/or heat]			[choose: Constantly used / sometimes / seldom / to be decommissioned]
Ptuj District Heating	Public		District heating - Natural gas	27,60 MW 2,34 MW electrical power (CHP)	90.869,69 MWh – heat (theoretical) 8.016 MWh (actual)		Used constantly during the heating season and for heating of sanitary hot water in the summer. Currently preparing projects for renovation and transition to wood biomass
Maribor District Heating	Public		District heating - Natural gas				Used constantly during the heating season

In the Podravje region are no larger Conventional energy production plants. Electricity is produced mostly in larger hydropower plants and small individually installed CHP plants and PV installations. The heat is mostly produced individually, there are only few district heating systems that are producing heat with larger boilers on Natural gas and Heating oil.

### 6.2. Renewable energy production

#### Energy production capacities

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 <sub>2</sub> - emissions in t	Utilization rate (qualitative assessment)
	[choose: Public / private SME / private large enterprise]			[state: electr. and/or heat]			[choose: Constantly used / sometimes / seldom / to be decommissioned]

Hydropower plant Formin	private large enterprise	1978	Hydrop ower plant	116 MW	548.000 MWh	0,0	Constantly used
Hydropower plant Zlatoličje	private large enterprise	1969	Hydrop ower plant	114 MW	577.000 MWh	0,0	Constantly used
Hydropowerplant Mariboski otok	private large enterprise	1948	Hydrop ower plant	60 MW	247.000 MWh	0,0	Constantly used
Hydropower plant Fala	private large enterprise	1918	Hydrop ower plant	58 MW	270.000 MWh	0,0	Constantly used

The company DEM is the largest energy producer in the Podravje Region. DEM is the owner of 8 large and 2 small hydropower plants on the river Drava, 1 small hydropower plant on the river Mura (4 large and 3 small hydropower plants are in the Podravje region) and 4 solar power plants. The total installed power of the power station is nearly 600 MW. The river Drava has a potential of 2.896 GWh of produced electricity per year. Currently 97,8 % of the potential is exploited. Company Dem is planning the construction of a pumped storage plant Kozjak with 440 MW of installed power.

### **6.3. Transmission and distributions**

The company Elektro Maribor, company for electricity distribution d.d. is an integral part of the electricity system of the Republic of Slovenia and is the second largest distribution company in Slovenia.

The main activities of the company are:

- Distribution of electricity;
- Utility constructions for electricity and telecommunications.

Elektro Maribor d.d. is the owner of the electricity infrastructure. From 1. 7. 2007, the company carried out tasks of distributing electricity on the basis of the Treaty on the lease of electricity distribution infrastructure and provision of services for SODO I.I.c. (Hereinafter referred to as the Treaty), which the Government of the Republic of Slovenia with a decree granted the concession for the utilities of operating the electricity distribution network (Ul. RS, no. 39/07).

These services include:

- Maintenance of electricity infrastructure and organization of the emergency services.
- Management and operation of the electricity network.
- Development, planning and investment in electricity infrastructure.
- Preparation and investment management.
- Monitoring and assessment of quality of care.
- Electricity metering.
- Implementation of the service access to the distribution network and other services to users.
- Implementation of other services for SODO.

Gasification Slovenia began in the early seventies. Newly discovered deposits of natural gas in Russia and Algeria as well as the growing energy needs of the booming economy of Europe presents a natural

gas as an economical and practical power source. With the newly constructed pipelines in Austria and Italy it has become feasible even thinking about the possibilities of natural gas supply in Slovenia, since Slovenia does not have its own gas reserves.



The picture is showing the natural pipeline grid in the Podravje region. With blue colour are marked the existing pipelines and with the red colour the planned pipelines.

In the heating sector in Podravje region we have individual local district heating systems (Maribor, Ptuj, Lenart). The lengths of the hot water pipelines are: Maribor – 34.066 m; Ptuj – 5.990 m; Lenart – 4.800 m.

The river Drava flows in Slovenia through two regions (Drava region and Carinthia). With 8 large and two small hydropower plants on the river Drava and 1 small hydropower plant on the river Mura is produced nearly a quarter of Slovenian electricity. The annual production of the DEM company (owner of the hydropower plants) amounts to 2.664 million kWh, representing 80 percent of the Slovenian electricity that meets the criteria of renewable resources and standards of the internationally recognized certificate RECS (Renewable Energy Certificates System).

#### **6.4. Jobs in the energy sector**

In the electricity production and services are currently about 1.107 employed. The construction of a pumped storage power plant would mean new jobs in the region. Since there are only two bigger district heating systems and a few individual solar power plants and biogas power plants it is hard to give an exact number of employed people in this field. Since wood biomass is a local resource in every region of Slovenia great emphasis is given on the use of wood as a heat source. The promotion of wood biomass has a positive effect on regional economy in the entire value chain.

In the Podravje region are no coal or lignite mines and therefore the mining plays no role for the regional economy.



## 7. Final energy consumption

*Final energy is a form, which might already been subject to conversion from the raw fuel. It is the energy made available to the user.*

### 7.1. Households

Regional final energy consumption of household sector	2.288	GWh
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#### Heat consumption

Total heat energy consumption of households sector (heating and hot water consumption)	1.719	GWh
Average heat energy consumption per household	12.790	kWh/hh

The average building standard.

Older, inadequate isolated buildings in Slovenia consume more than 200 kWh/m<sup>2</sup> per year for heating. By 2020, all newly constructed buildings in Slovenia should achieve values of nearly zero-energy buildings.

Residential buildings from different periods have different structures and energy positions, so energy consumption in them is different - in most cases, too high. Older buildings are less thermally protected and not airtight, worse building furniture, inefficient heating systems - causing large heat demand. In those buildings energy renovation is more difficult because often there is also needed a renovation of the construction.

#### Construction before 1920

Multi-dwelling buildings before 1920 have mixed stone-brick walls with a thickness of 38 to 65 cm, boxy windows, they have ornamented and often monument protected façades. Due to the age of these buildings they need comprehensive energy and construction renovations. Thermal protection is executed from the inside, windows have to be special because of the historical protection, the thermal bridges are rehabilitated from inside (on the contact of external and internal walls), the ceiling of the basement and attic is being insulated.

#### Construction until 1940

Residential buildings from the pre-war period until 1940 are normally solid built but poorly maintained, with thick solid brick external walls with a thickness of 38 cm and wooden frame windows. The implementation of the external thermal insulation is already possible as well as insulation of the ceiling in the basement and the attic, mounting passive windows, ventilation with heat recovery, etc ...

#### Building until seventies without thermal insulation

Residential buildings built until the mid-seventies, are inferior, or the same quality constructed as buildings, which were built until 1940; the reasons were mainly in saving of construction materials. The walls are 30 cm thick with simple facades without thermal insulation. These buildings require thorough construction and energy restoration, window replacement and other maintenance measures. In buildings of this period it is possible to achieve a significant reduction of energy needed, with minimal additional investment measures.

### **The eighties with a minimum of thermal insulation**

New regulations in the eighties, when the period of intensive construction of large housing estates has begun, have demanded greater control for multi-storey residential buildings, especially high-rises. The buildings are solid with an additional layer of thermal insulation. The windows are large, aluminium or wood and mostly unsuitable because of the single or double glazing. Energy and construction - measures for such buildings should be based primarily on the replacement of the inadequate windows and additional thermal insulation of roofs and ceilings as well as the rehabilitation of major thermal bridges, air tightness, sound protection and establishing ventilation with heat recovery

### **Newer buildings are better insulated**

In the nineties, the construction has become very diverse, in addition to the brick building appears prefabricated construction, especially for single-family houses. The share of brick buildings with thermal insulation of structural components increases, so that the buildings are on average quite well insulated. Windows are wooden, aluminium or PVC. Everywhere prevails double glazing, until 2000, mainly "thermopane" and after 2000 they implement energy-efficient double-layer glazing.

73 % of buildings in Slovenia are single-family houses and because of rising energy prices (especially fossil fuels for heating) the energy renovation of buildings is a very important topic in the last few years. Energy renovation of old buildings is also supported by subsidies and therefore even more attractive.

### **Electricity**

Electricity consumption of households	522	GWh
Average electricity consumption per household	3.883	kWh/hh

National or regional programmes for reducing household electricity.

### **ECO FUND**

Eco Fund's main purpose is to promote development in the field of environmental protection. It is the only specialised institution in Slovenia that provides financial supports for environmental projects. The financial assistance is offered mainly through soft loans from revolving funds and since the year 2008 through grants. In comparison with commercial banks, Eco Fund's principal advantages in the market for environmental financing are that it provides soft loans at lower interest rates than prevailing commercial market rates and it is able to lend for significantly longer periods than commercial banks. For the purpose of reducing household electricity are currently no subsidies for replacement of larger household appliances like washing machines, refrigerators, etc. ECO FUND offers a soft loan for that purpose.

### **Cooking**

Gas consumption for cooking appliances of households	47	GWh
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For cooking in households following energy sources are used: natural gas, liquefied petroleum gas (LPG), wood fuels and electricity. Natural gas represents the lowest ratio (about 10 %) while LPG

represents 33,8 % of the energy for cooking. The dominating energy source for cooking is electricity (43,4 %).

### General information

Household electricity price	0,160	EUR/kWh (incl. taxes)
Household natural gas price	0,0627	EUR/kWh (incl. taxes)
Household district heating price*: variable part	0,07483 76	EUR/kWh (incl. taxes)
fixed part	3,4587	EUR/kW of installed power
Household price: Heating oil	0,0855	EUR/kWh (incl. taxes)
Energy expenditure by household	6,7 %	of income

*\*the district heat price is divided on a variable and fixed part. The variable part is including the actual energy used (kWh). The fixed part depends on the installed power (kW).*

Households can decide for measurement and payment of electricity by one or double tariff system. The double tariff system is divided on peak and lower tariff. The peak tariff (VT) is the electricity consumption measured every weekday between 6.00 and 22.00 hour. The lower tariff (MT) is measured every weekday between 22.00 and 6.00 and every Saturday, Sunday and Holidays between 00.00 and 24.00. The aim of double tariff system is to encourage the consumer to use less energy during peak hours, or to move the time of energy use to off-peak times such as night time and weekends. The Slovenian Government decides on the tariff system for the sale of electricity. Peak demand management does not necessarily decrease total energy consumption, but could be expected to reduce the need for investments in networks and/or power plants for meeting peak demands. Existing electricity meter are being replaced with the so-called smart meters. The replacement should be completed by 2022.

According to one of the definitions, energy-poor are those households that use over 10 % of their income to provide adequate warm housing and cover other energy needs. Households in Slovenia in 2015 spent for electricity, gas and other fuels, on average, 6,7 % of its available resources. Households with the lowest incomes have spent for energy purpose almost 18 % of its available funds. 20 % of households (households with the lowest incomes) are using 17,7 % of their income for energy needs.

Estimation of trends in final energy consumption in the household sector ( -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

+2

The estimation of the trend is given according the data and predictions for the final energy consumption of Slovenia households in the *Energy Balance of the Republic of Slovenia (ebrs 2016)*.

## 7.2. Service Sector

Regional final energy consumption of service sector	774	GWh
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The service sector in Podravje employs 63 % of all employed people in the region and provides over 60 % of the regional GDP. The main sub-sector in the field of market activities are trade and catering and public and health in the field of nonmarket activities. The overall building standard is improving in the last years as a result of energy renovations, especially in the public sector.

Estimation of trends in final energy consumption in the service sector ( -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

-1

The estimation of the trend is given according the data and predictions for the final energy consumption of Slovenia service and industry sector in the Energy Balance of the Republic of Slovenia (ebrs 2016).

## 7.3. Industry

Total energy consumption of the industrial sector	1.821	GWh
Industry electricity price	0,926	EUR/kWh (incl. taxes)
Industry natural gas price	0,0418	EUR/kWh (incl. taxes)
Industry district heating price	/	EUR/kWh (incl. taxes)
Industry price: other energy sources – specify:	/	EUR/kWh (incl. taxes)

The main sub-sector in the Industry is the manufacturing sector. Industry represents 35,8 % of all employed people in the Podravje region and therefore still very important for the regional economy.

## 7.4. Transport

Regional final energy consumption of transport sector	2.687	GWh
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The regional motorisation rate is 508 cars per 1000 inhabitants in the region. The total length of the roads in Podravje region (national and municipal owned) is 6.555,6 km. According to the definition of the OECD (*Organisation for Economic Co-operation and Development*) Podravje is a predominantly rural region. Public transport is well developed in Maribor, the Urban center of Podravje, in other city centers the public transport is not so common because of their relative small size. There are public transport connections between cities and the rural areas of the region.

In 2016 in the Podravje region 7,47 million tonnes of goods were transported and unloaded and 7,97 million tonnes of goods were loaded and transported with the road freight transport. Since joining the EU in 2004, Slovenia has become an important transit country in freight transport. The freight transport is daily polluting, causing excessive noise, burdens the road network and causes many accidents. It is important that Slovenia develops the rail network and redirects the freight transport there.

**Passenger transport**

Motorisation rate - number of passenger cars/1000 inhabitants	508	
Regional energy consumption of passenger transport in the region	1.420	GWh

**Freight transport**

Regional energy consumption of road freight transport	1.222	GWh
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40 % of incomes from the railroad transport is provided with the freight transport. The railroad transport is an important aspect in decreasing the transit freight road transport. According to the white paper *Roadmap to a Single European Transport Area* the EU has set a target of redirecting 30 % of road freight transport of over 300 km to the rail freight transport. The current railroad network would not be able to transfer such an increase. In the past years the railroad through the region has been renovated but to take over such increase of the transport new investments in the railroad network are necessary.

**Use of alternative fuels**

In accordance with the Directive 2009/28/EC on the promotion of the use of energy from renewable sources, is required a 10 % share of energy from renewable sources in all modes of transport by 2020. One possibility to reach the goal is electricity, which has to be produced from renewable sources. Therefore, the electricity used in the transport sector will need a proof of the share of RES. Other possibility are biofuels. In the Podravje region are relative good conditions for the cultivation of oilseed rape, which is the raw material for the biodiesel production

Despite the rather promising predictions of the positive effects of biofuels, there is a growing doubt about the use of biofuels in recent years. In particular, the disputed production and the use of the first generation biofuels (agro fuels), which are expected to have negative effects on biodiversity, water and soil protection, global land use change, rising food prices. Therefore, attention is therefore slowly shifting to the second generation of biofuels (waste, plant residues, such as wood biomass, straw, grass), which has not yet been sufficiently explored, and production on the basis of existing technology is rather expensive (EEA, 2008). The EU, with high motor fuel prices and a growing energy dependence, places a lot on biofuels, which, together with other renewable energy sources, will represent 10% of the energy mix by 2020 (EEA, 2009; Renewable Energy Directive 2009/28 / EC).

In 2010, almost 3 times more land was sown with oilseed rape than in 2005. In 2010, it was sown to 6.464 ha, which, with a yield of 15.518 tons, enabled the production of over 5.000 tons of biodiesel. Biodiesel was produced by only one registered producer, producing 20.561 tonnes of biodiesel from oilseed rape in 2012, imported raw material was also used. In 2013, the same registered producer produced only 1,7 ton of biodiesel, which was produced from imported raw materials. In 2014 and 2015, the only producer, due to economic reasons, completely stopped biodiesel production. In recent years, the production of biodiesel in the RS has been disproportionately small in terms of production capacities, for which producers blame the market/price situation in the area of mineral/fossil fuels and biofuels.



Estimation of trends in final energy consumption in the transport sector ( -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

+1

The estimation of the trend is given according the data and predictions for the final energy consumption of Slovenia transport sector in the Energy Balance of the Republic of Slovenia (ebrs 2016).

## 7.5. Summary

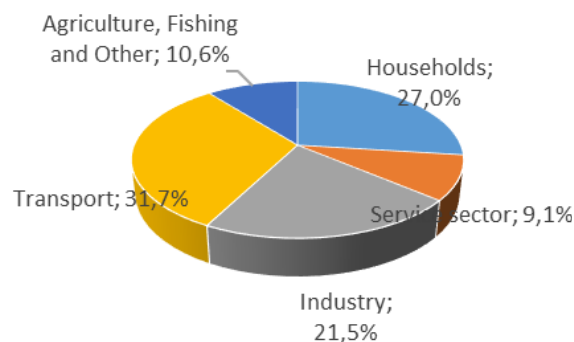
### Final energy indicators

#### General indicators for the region

Total final energy consumption	8.469,90	GWh
Final energy consumption per capita	26.259,59	kWh/cap
Electricity consumption per capita	6.156,11	kWh/cap
Heat consumption per capita	7.975,81	kWh/cap
% of total country consumption	15,5	%

#### Final energy consumption per sector

Year: 2015			%
Households	2.288,00	GWh	27,0
Service sector	774,00	GWh	9,1
Industry	1.821,00	GWh	21,5
Transport	2.687,00	GWh	31,7
Agriculture, Fishing and Other	899,90	GWh	10,6
<b>Sum</b>	<b>8.469,90</b>	<b>GWh</b>	<b>100,0 %</b>



Estimation of trends in final energy consumption ( -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

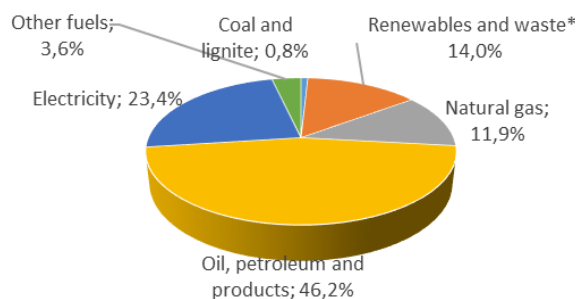
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The estimation of the trend is given according the data and predictions for the final energy consumption in the Energy Balance of the Republic of Slovenia (ebrs 2016).

### Final energy consumption by fuel

#### Total final energy consumption by fuel

Year: 2015			%
Coal and lignite	71,65	GWh	0,8
Renewables and waste*	1.187,50	GWh	14,0
Natural gas	1.007,76	GWh	11,9
Oil, petroleum and products	3.911,72	GWh	46,2
Electricity	1.985,62	GWh	23,4
Other fuels	305,65	GWh	3,6
<b>Sum</b>	<b>8.469,90</b>	<b>GWh</b>	<b>100,0 %</b>



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

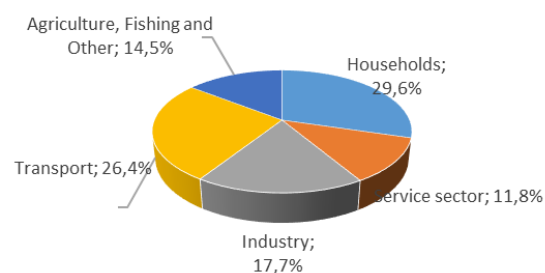
### Primary energy equivalent

**Primary energy** is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels.

Total Primary Energy Consumption	11.189,83	GWh
Primary energy consumption per capita	34.692,29	kWh/cap
Primary energy factor of electricity	2,5	-
Energy intensity	0,00224425	TPES/GDP

#### Primary energy equivalent by sector

Year: 2015			%
Households	3.311,42	GWh	29,6
Service sector	1.322,01	GWh	11,8
Industry	1.977,17	GWh	17,7
Transport	2.955,70	GWh	26,4
Agriculture, Fishing and Other	1.623,52	GWh	14,5
<b>Sum</b>	<b>11.189,83</b>	<b>GWh</b>	<b>100,0 %</b>



**Dependency on fuel imports:** very high / high / average / low / very low

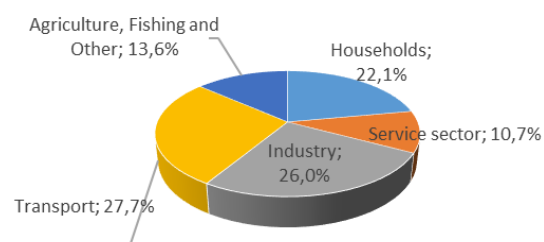
With domestic energy sources, Slovenia in 2015 meet 52% of all energy needs. The remaining required amount has been secured from imports; supply of petroleum products and natural gas has been fully guaranteed by imports.

### Regional CO<sub>2</sub>-emissions associated with energy consumption

Total CO <sub>2</sub> -emission associated with energy sector	2,53	Mio t
CO <sub>2</sub> -emissions per capita	7,832	t/cap
CO <sub>2</sub> -emissions per GDP	0,507	t/€ GDP

### Energy-related CO<sub>2</sub>-emissions by sector

Year: 2015			%
Households	558.882	t CO <sub>2</sub>	22,1
Service sector	270.109	t CO <sub>2</sub>	10,7
Industry	656.091	t CO <sub>2</sub>	26,0
Transport	698.620	t CO <sub>2</sub>	27,7
Agriculture, Fishing and Other	342.756	t CO <sub>2</sub>	13,6
<b>Sum</b>	<b>2.526.457</b>	<b>t CO<sub>2</sub></b>	<b>100,0%</b>



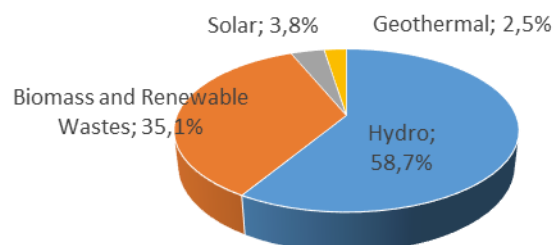
## 8. Renewable energy sources – status and potential

### 8.1. General information

Renewable Energy Targets:		
2020 RES share in gross final energy consumption	25	%
2030 RES share in gross final energy consumption	/	%
Current RES share (2015)	22,8	%
thereof RES out of the region	/	%

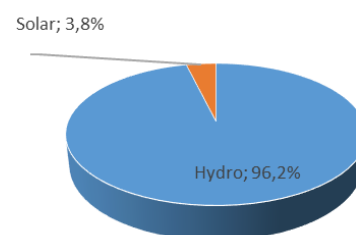
### Share of final energy consumption produced by renewable fuels

Year: 2015			%
Hydro	1.642	GWh	58,7
Wind	0	GWh	0
Biomass, biofuels and renewable wastes	981	GWh	35,1
Solar	105	GWh	3,8
Geothermal	70	GWh	2,5
Tide, Wave, Ocean	0	GWh	0
<b>Sum</b>	<b>2.798</b>	<b>GWh</b>	<b>100,0%</b>



**Share of total electric demand covered by renewable fuels**

Year: 2015			%
Hydro	1.642	GWh	96,2
Wind	0	GWh	0
Biomass, biofuels and renewable wastes	0	GWh	0
Solar	65	GWh	3,8
Geothermal	0	GWh	0
Tide, Wave, Ocean	0	GWh	0
<b>Sum</b>	<b>1.707</b>	<b>GWh</b>	<b>100,0%</b>



The target share of renewable energy in the transport sector is 10 % of renewables in the year 2020. The target for the year 2017 is at least 6,2 % of renewable energy in the transport sector (according to the *Regulation on renewable energy in transport; Uradni list RS, št. 64/16*).

As already described above, the main RES energy producer in the region is the river Drava. Four large hydropower plants in the region are producing about 1.642 million kWh of electricity per year, what is about 15 % of total electricity produced in Slovenia.

In the field of heat production there is a district heating on wood biomass running in municipality Lenart. The installed power of the biomass boiler is 3,5 MW. Other district heating systems on wood biomass are planned.

On the national level we have a support scheme for the electricity production from renewable energy sources. Borzen is implementing support schemes for the production of electricity from renewable energy sources and highly efficient cogeneration of heat and electricity.

**Funding renewable energy projects:**

Source of funding	%	Comments
<b>Own funds</b>	65%	- small enterprises
	55%	- medium enterprises
	45%	- large enterprises
<b>Regional funding</b>	/	No regional funding available
<b>National funding</b>	/	/
<b>EU funds (e.g. EFRE)</b>	35%	- small enterprises
	45%	- medium enterprises
	55%	- large enterprises
	100 %	

In the table above, the currently available funding scheme for the construction of new district heating systems or the reconstruction of existing systems with the transition to renewable energy sources is presented. The funding scheme depends on the size of the organisation of the investor (Small, medium or large enterprise).

For citizens ECO fund offers subsidies which cover in average 20 % of the investment into RES projects. Financial resources for the implementation of programs for increasing the use of RES are guaranteed by all final customers with the addition to the price of heat or to the price of fuels for increasing the energy efficiency that they are obliged to pay to the heat supplier or the supplier of fuels

In most Member States, there are still many barriers to the introduction of renewable energy sources that reduce the effectiveness of measures to promote them and irritate their introduction.

In Slovenia and the Podravje region these barriers are:

- very long procedures in issuing the necessary permits and documents,
- ignoring the potential of RES in the process of spatial planning,
- financial - lack of investors
- social acceptability - disapproval of local communities or civil initiatives

Since Slovenia is a small country and the barriers are a problem also on national not just regional level, they should be addressed on national level, but maybe the success rate would be better when addressing these barriers on local level first starting with small communities (bottom-up approach).

*Estimation of trends in renewable energy production ( -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).*

+2

The estimation of the trend is given according the data and predictions for the energy production from RES in the Energy Balance of the Republic of Slovenia (ebrs 2016). Supporting factors for the energy production from RES are mainly of financial nature either financial support for electricity production or subsidies for replacement of fossil fuel heat boilers and the transition to renewable sources. A supporting factor as well is also the increasing environmental awareness, but at the same time the environment is also a barrier. Excessive use and a non-sustainable use of renewable sources can also have negative effects on the environment, for example: Hydropower plants can have a strong impact on aquatic flora and fauna and the natural environment. One of the barriers is also the higher price for the energy produced from RES due to the higher price for the RES technology.

## **8.2. Available natural resources in the region**

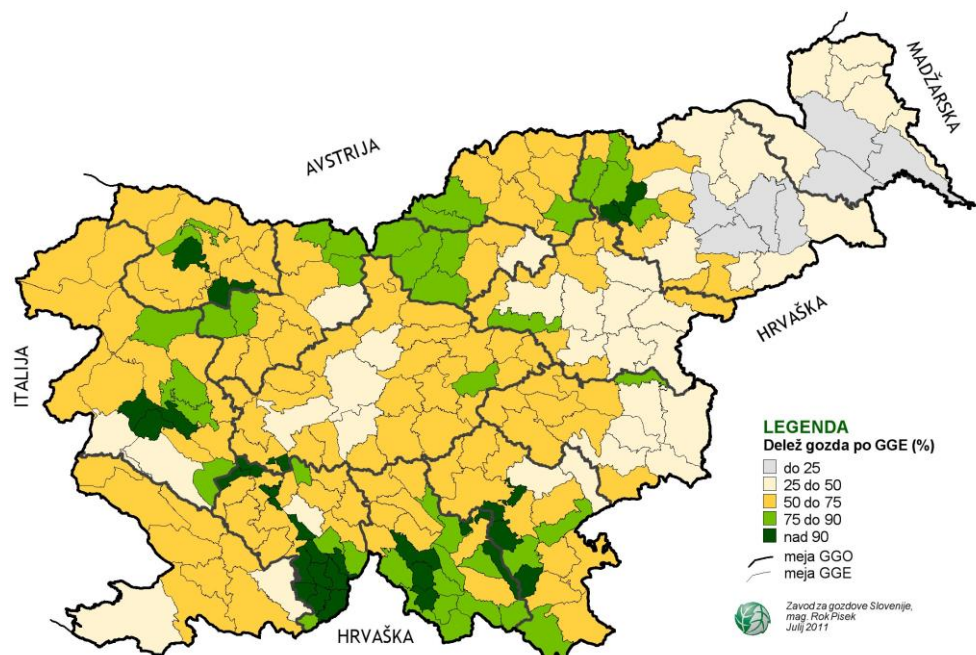
### **Biomass**

The total area of forests in the Podravje region is 84.339,42 ha and 74,82 % of them are private forests, 24,22 % are owned by the state and less than 1 % are owned by municipalities. The wood stock amounts to 29,503.456,27 m<sup>3</sup> and the annual growth amounts to 777.605,01 m<sup>3</sup>. The theoretical potential of wood suitable to be used for energy purposes is 142.704,94 tonnes. The actual potential of wood for energy purposes is the amount of wood that is currently available on the market. The actual (technical) potential of wood that can be used for energy purposes is 40.988,36 tonnes, what means that the theoretical potential is exploited by less than 30 %. The reason for the difference between these values are because of the high share of private woods, where much less logging is taking place.

The main agricultural products in the region are wheat and corn. Some of the possibilities for the use of biomass for energy purposes are the use of corn, residues from the harvest and animal faeces in biogas plants or the production of biofuel from rapeseed. The energy potential from agricultural products are also residues from vineyards and orchards.



Overgrown areas are presenting a great potential of wood biomass. Wood biomass is not only in forests but also in other areas of trees and bushes. According to assumptions of the Forestry institute of Slovenia these areas represent 21 % of the total wood biomass potential.



The share of forests in the Podravje region is less than 25 % in the central part and up to 90 % or more in the north-western part of the region.

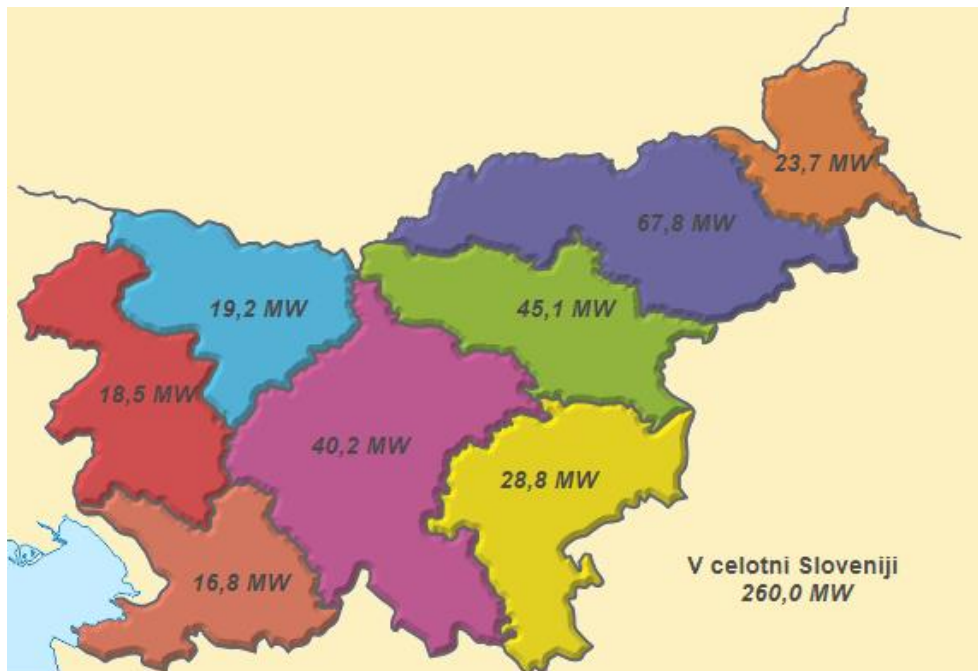
### ***Hydro power (incl. tide and wave power)***

The river Drava flows through two Slovenian regions – Carinthia and Podravje region. Drava is the most “energy” exploited river in Slovenia. The river Drava has a potential of 2.896 GWh of produced electricity per year. Currently 97,8 % of the potential is exploited. On the river Drava are installed 8 large hydropower plants (4 of them are in the Podravje region) and 2 small hydropower plants. There is also one small hydropower plant on the river Mura and one private owned on the river Dravinja. The difference between micro, small and large hydropower plant are in their capacity (nominal installed power of the turbine): micro hydropower plant – up to 36 kW; small hydropower plants – from 36 kW – 10 MW, large hydropower plants – over 10 MW.

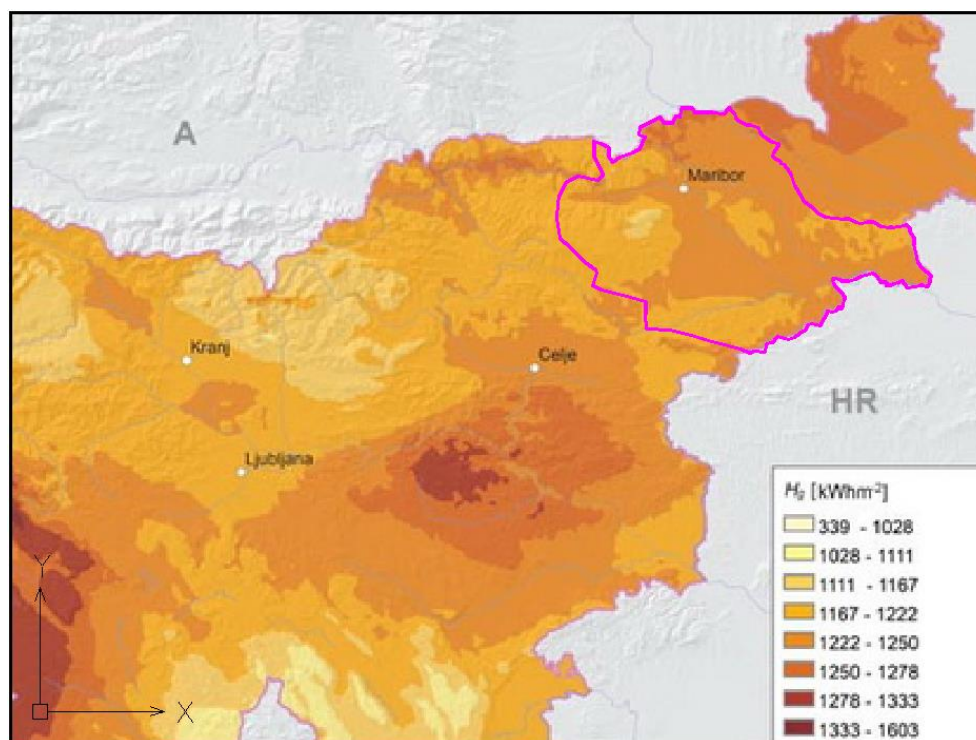
Near the main city of Podravje – Maribor is planned a pumped storage hydro plant. The use of tide and wave is not possible because Podravje has no sea side.

**Solar power**

Solar irradiation (on optimally inclined plane) per year

from 1.028 to  
1.250kWh/m<sup>2</sup>

In the Podravje region are installed around 680 PV plants with the total installed power of 58,9 MW. They are producing around 65 GWh of electricity.

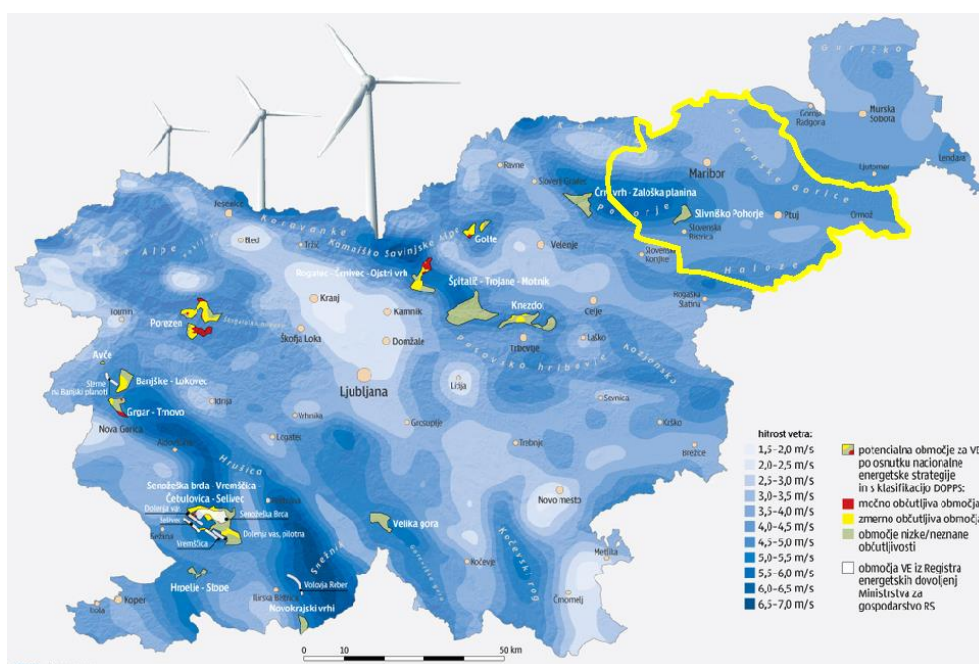


The average value of the solar radiation in Podravje amount to about 1.200 kWh/m<sup>2</sup>

### Wind power

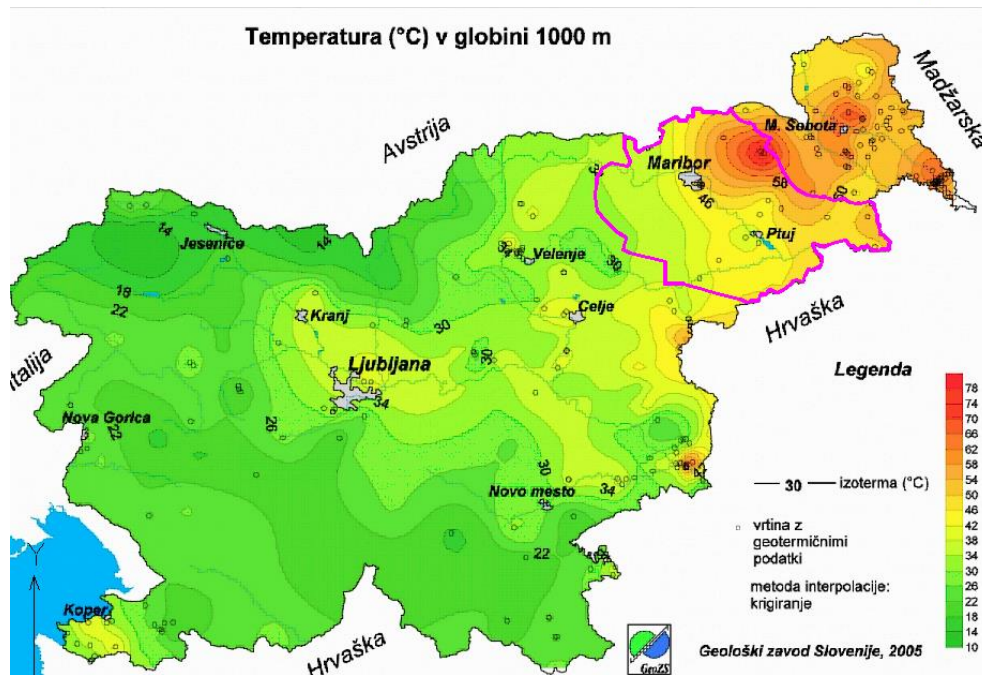
Average wind velocity	From 2.5 to 6.0	m/s
Full load hours	< 1,000	h/a

Since Podravje region has no sea site there is no offshore potential. In Slovenia are currently operating 2 wind turbines and larger fields of wind power plants are planned. In the Podravje region are no such plants and at the moment. According to the national energy strategy there is only one possible location for the installation of a wind power plant in the Podravje region.



### Geothermal energy

The geothermal energy potential in Podravje is quite well. Geothermal energy in the region is used only directly in thermal spas. Geothermal energy for district heating is currently used only in the neighbouring region (Pomurje region). In the Podravje region we have an Aquifer called Termal II lying at different depths (up to 5000 m), which is suitable to produce electricity. The water temperatures are between 90 °C and 175 °C. First projects are already made and the construction should begin in few years.



## Waste

Every person in the Podravje region annually produces in average 438 kg of waste, this means 141.275 tonnes per year. 25 % of the waste - the so-called light fraction is suitable for energy processing, because this fraction has a calorific value of 20 MJ/kg or even more. That means a theoretical potential of 196 GWh of energy per year.

Currently, there are no plants for the energy recovery of waste in the region.

## Restriction through protected areas

One of the problems in Slovenia as well as in the Podravje region are the natural protected areas (Natura 2000) and in the case of exploiting the wind power is the situation that the most suitable areas for wind power plants are at the same time protected areas. There were also plans for pumped storage hydro power plant but the project has met with resistance and disapproval by civil initiatives and environmental associations due to excessive intervention in nature.



## 9. Energy efficiency – status and potential

*Funding energy efficiency projects.*

Source of funding	%	Comments
<b>Private investors/ project developers/ own funds</b>	50	In the case of Public order – own funds In the case of Public-partnership – private investors
<b>Regional funding</b>	/	No regional funding available
<b>National funding</b>	10	Subsidy
<b>EU funds (e.g. EFRE)</b>	40	Cohesion funds
	100 %	

In the table above, the currently available funding scheme for the renovation of public buildings is presented. There are two approaches; Public order and the Public-private partnership. In the case of a Public order the renovation is funded up to 40 % from the cohesion funds, 10 % from national funding and 50 % of the investment is funded by the owner of the building. The public-private partnership is similar, with the difference that the share of the owner is covered by the private partner.

For citizens ECO fund offers subsidies which cover in average 20 % of the investment into an energy renovation projects. Financial resources for the implementation of programs for increasing energy efficiency are guaranteed by all final customers with the addition to the price of heat or to the price of fuels for increasing the energy efficiency that they are obliged to pay to the heat supplier or the supplier of fuels.

The goals set in the National Action plan for energy efficiency (in accordance with the Energy Efficiency Directive) are:

- the reduction of the use primary energy until 2020 (Article 3 of EED);
- every year to renovate 3 % of the building stock owned by the government (Article 5 of EED);

The process of primary energy reduction runs in the frame of set annual targets but the use in the industry sector must be reduced in the future. The goal in the frame of the 5<sup>th</sup> Article of EED was not reached in the year 2014.

The goals set in the Energy Performance of Buildings Directive are:

- all new buildings after 31.12.2020 must be built as near zero energy buildings,
- all new public buildings after 31.12.2018 must be built as near zero energy buildings.

Slovenia as a EU member has prepared the National plan for increasing the number of nearly zero-energy buildings according with the provisions of the EPBD. Slovenia has prepared an analysis of cost-optimal requirements for energy efficiency of three types of buildings (single family houses, multi-family houses, and non-residential buildings). The analysis serves as a technical basis for the planning of nearly zero-energy buildings.

*Analyse the sectors:*

*Households:*

At the local level in Slovenia there is set a network of energy consultants (called ENSVET) with the purpose to advise citizens in energy matters. People can get free information's of how to reduce energy

costs of their households, on measures to achieve energy efficiency, on programs of co-financing of those measures, etc. The counselling increases energy awareness of citizens, increases energy savings and reduces greenhouse gas emissions and thereby facilitates the implementation of certain measures and programs related to energy policy. The financial support is provided with the ECO Fund. Eco Fund's main purpose is to promote development in the field of environmental protection. It is the only specialised institution in Slovenia that provides financial supports for environmental projects. The financial assistance is offered mainly through soft loans from revolving funds and since the year 2008 through grants.

*Service sector:*

In the field of awareness campaigns on energy efficiency the ECO fund offers co-financing of Educational, awareness raising and promotional projects on topics that represent priority areas of the ECO Fund.

*Industry:*

The provisions of National Action plan for energy efficiency are covering all sectors. The Industry is a big energy consumer has a great impact on the environment therefore energy efficiency measures are implemented in this sector. The ECO Fund is offering soft loans and subsidies for energy audits, implementation of energy efficiency measures (energy renovations, heating system optimizations) and installation of cogeneration of heat and power systems (CHP plants).

*Transportation:*

ECO Fund offers favourable loans and subsidies, for the purchase of electric or hybrid vehicles, for citizens, service and the public sector.

Estimation of trends in energy efficiency development ( -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

+3

**Demand side management, smart metering, storage**

Demand side management is already in use and the replacement of electricity consumption meters with the so-called smart meters is in progress but in terms of integration of information and communication technology and the power system we are still at the beginning of the development. One of the aims in the future for Podravje is to become a “smart region”, what means that a lot of effort and emphasis will be put to develop all the necessary strategies and later to implement all the measures such as management systems and storage.

## 10. SWOT analysis

*SWOT-analysis for the development of your region towards a low-carbon economy in 2050.*

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Well-developed REN production</li> <li>• Good RES potential</li> <li>• Good awareness of the general public</li> </ul>	<ul style="list-style-type: none"> <li>• Poor availability on regional energy data</li> <li>• No regional policies and strategies on energy matters</li> <li>• Very long procedures in issuing the necessary permits and documents</li> <li>• Lack of investors</li> <li>• High costs of REN production compared with conventional energy production</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• To strengthen the production of REN</li> <li>• To improve the EE in Transport sector</li> <li>• To take advantage of EU and national financial supports until 2020 and improve the EE of residential buildings and buildings in the public sector, private sector and Industry</li> </ul>	<ul style="list-style-type: none"> <li>• Unsustainable use of renewable sources</li> <li>• Disapproval of general public</li> </ul>

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



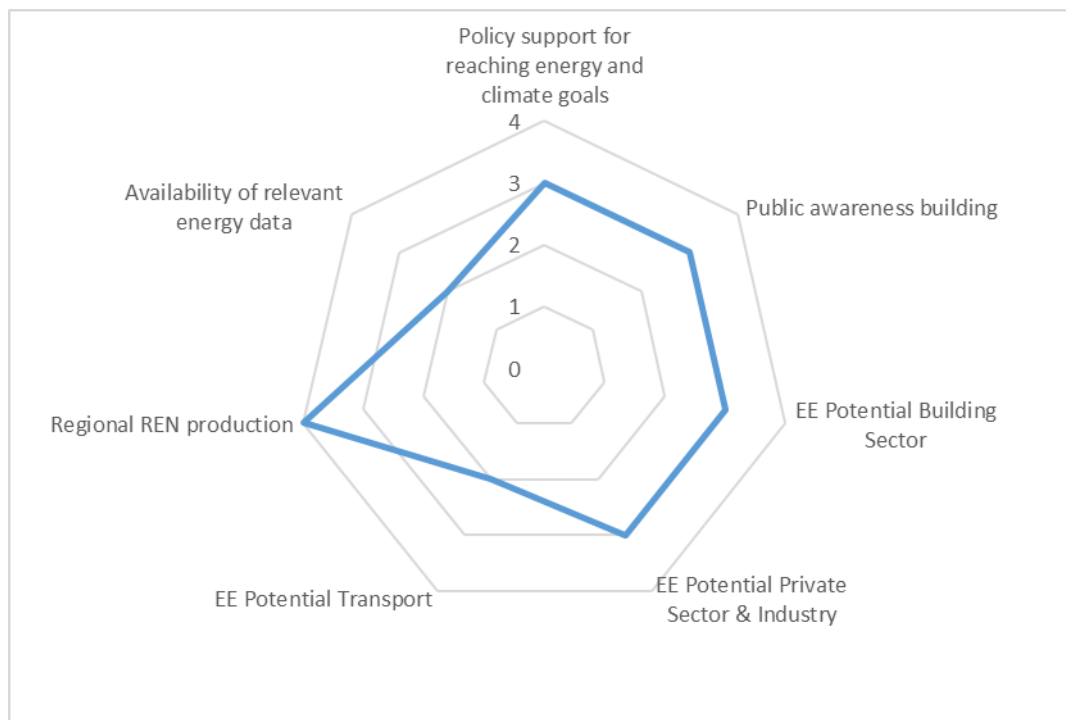
### Self-assessment:

Points:

1 ... no measures set/ potential unused

to

5 ... fully developed/ potential fully used



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

Please include your sources/bibliography, a list of identified stakeholders, etc.

- Republika Slovenija, Statistični urad <http://pxweb.stat.si/pxweb/dialog/statfile1.asp>
- Republika Slovenija, Ministrstvo za infrastrukturo, portal energetika, <http://www.energetika-portal.si/>
- Republika Slovenija, Ministrstvo za okolje in prostor, Agencija Republike Slovenije za okolje (ARSO): <http://www.arso.gov.si/en/>
- Dolar G., 2016, *Geografske zasnove rabe obnovljivih virov v Sloveniji do leta 2030*, diplomsko delo, Univerza v Ljubljani
- PV portal, Slovenski portal za fotovoltaike, <http://pv.fe.uni-lj.si/>.
- Republika Slovenija, Ministrstvo za okolje in prostor, Lesna biomasa. <http://www.zgs.si/slo/delovna-podrocja/lesna-biomasa/index.html>
- Dravske elektrarne Maribor. <http://www.dem.si/sl-si/Elektrarne-in-proizvodnja/Elektrarne>
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- Humar M., Ljubljana 2008, *Potencial lesne biomase za energetske namene v Sloveniji*, diplomsko delo, Univerza v Ljubljani.
- Mag. Kovič S., mag. Praznik M., *SANACIJA VEČSTANOVANJSKIH STAVB V PASIVNEM IN NIZKOENERGIJSKEM STANDARDU*, [http://www.lesena-gradnja.si/html/img/pool/SANACIJA\\_STANOVANJSKIH\\_STAVB.pdf](http://www.lesena-gradnja.si/html/img/pool/SANACIJA_STANOVANJSKIH_STAVB.pdf)
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- Rogelja T., dr. Krajnc N., Triplat M., Ščap Š., avgust 2014, *Analiza potencialov lesne biomase iz gozdov in hitrorastočih nasadov a območju podravske, spodnjeposavske, jugovzhodne regije*, project BioHeatLocal.