

# REGIONAL ENERGY PROFILE

Region: Pleven  
English version

by  
WWF Bulgaria



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 (municipal/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 Central and Eastern European (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 Province of Pleven<sup>1</sup>, 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 the completion of this Regional Energy Profile were used the following sources:***

*Most of the information for this document was gathered from the annual statistics and publications made by the National Statistical Institute of Bulgaria. The „Regional Profiles: Indicators of Development” that are made by the Institute for Market Economics were also used for some of the information about Socio-Economic Development, Investments and Transport infrastructure.*

*A full list of the used sources can be found in the Annex.*

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<sup>1</sup> Bulgaria has 6 planning regions add they have 28 provinces. Pleven is one of those provinces, it has 11 municipalities in which there are 14 towns and 109 villages.



## 2. General introduction of the region

Region Pleven NUTS- BG314



### **Geography**

*The region is located in the central part of North Bulgaria and the eastern part of North-East planning region of Bulgaria.*

*The landscapes in the Central, Northern and Eastern part of the region are mainly plains and hills. The relief in the Southern part is mainly hills and low mountains.*

*The climate is temperate continental. The average temperature is about 12-13°C.*

*Pleven region has big amount of water sources. The main one is Danube River on its northern border. Other major rivers that flow through the region are Iskar, Vit and Osam. There is a big network of irrigation and drainage systems, protective dikes and many small and middle size dams on the watershed of Iskar, Vit and Osam.*

*The region has a small amount of mineral resources. The small deposits of natural gas and oil are exhausted.<sup>2</sup>*

*It has rich biodiversity of plants and animal species, although the majority of the territory is occupied by farmland.*

### **Important energy facilities**

*The main source of electricity is the national electricity system, through electrical substation "Pleven". TPP (Thermal Power Plant) "Pleven" has been built and its purpose is to supply the local industries.*

*There was a nuclear power plant project dating back to the turn of the century. Subsequently, the procedure that was launched for the realization of NPP "Belene", which would have transformed Pleven region into one of the main power utility centres of the country was finally canceled in early 2012.*

*There is also a gas pipeline passing through the region.*

*Lastly Pleven region has installed capacity of the RES as follow:*

*5 numbers of hydro power plants with total installed capacity of 6 MW.*

*4 numbers of wind turbines facilities with total installed capacity of 10 MW.*

*14 Number photovoltaic facilities with a total installed capacity of 56 MW, and one of them has an installed capacity of 50 MW*

### **Energy planning on national and regional level**

*National strategies, plans and legislation regarding energy development are adopted in the recent years. They are based on the idea of clean, efficient energy development, using more renewable sources and limiting the negative impacts on the climate.*

*Regarding the regional plans, there is a lack of understanding about their importance and there are only municipal plans and strategies concerning mainly the energy efficiency.*

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<sup>2</sup>Geospatial analysis in the region of Pleven 2013, 9-15 p.

### Features of field energy goals and difficulties

In the region of Pleven functions one TPP "Republic", which is destined for power of the industry concerned. All settlements in the area are electrified. The distribution grid was reconstructed and maintained a good level, but there are areas with impaired mechanical and electrical parameters. The construction of new substations met the needs for increasing capacity. The region doesn't have any future energy plans or goals at the moment.

## 3. Basic demographic data and figures

### Regional demographic indicators:

Population	251 986	citizens
Area	4653.3	km <sup>2</sup>
Density of population	54	citizens/km <sup>2</sup>
Number of the municipalities	11	municipalities

Data from 2015

### Demographics

In the last 20 years in Pleven region the density of the population had decrease and is getting older. Most - earliest data are from 2000. During this period in Pleven region have been living 314,965 people. Under working age were 16.58%, 54.66% had working age and the over the working age are 28.76%. For comparison, in 2015 the children fell to 14.44%, while people of working age and over increased by respectively 56.38% and 29.18%.

### Socio-economic development in recent 3-5 years

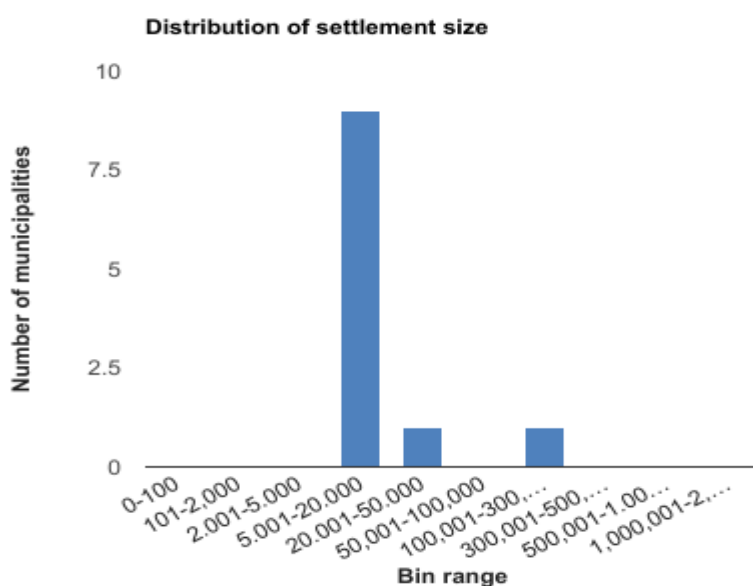
	2011	2012	2013	2014	2015	
Unemployment	12	10.3	12.1	9	9.2	%
Average annual salary per person (gross)	3225	3398	3602	3783	4036	EUR
Differences from the EU average (35 079 Euro gross)	90.55	90.01	89.37	89.01	88.5	%
Share of the employed in:						
Agriculture	6.46	6.64	6.77	7.10	6.87	%
Industry	35.86	35.46	35.21	33.57	34.63	%
Services	56.53	56.80	56.92	56.13	55.44	%
Share of population with university degree	18.5	21.7	22.9	23.6	24.6	%

Overall living conditions in Pleven are better than the national average, due to relatively high income and recovery of the labor market. There is a reduction of workers in the industry due to closures<sup>3</sup>. Regarding education, although it is improving and the number of graduates has increased, the region still lags behind the national average.

### Spatial distribution of the population, level of urbanisation

About half of the inhabitants are located in the municipality and city of Pleven - 123 673 people. They are followed by municipality and city of Red coast - 25 904 p., town and municipality of Dolna Mitropolia- 18 755 and 18 447 - town and municipality of Levski, while other municipalities have a population of 5-10 thousand or less. Typical in Pleven region are medium-sized and large villages and small towns.

<sup>3</sup> Regional profiles, Pleven 2015



#### 4. Economy in the region and economic trends

##### *Economic indicators for the region:*

GDP in total	886	million EUR
GDP per capita	3441	EUR/per capita
Human Development Index (HDI)	0.782	

Data from 2014

GDP in economic sectors:		
Agriculture	11.35	% of GDP in total
Industry	26.56	%
Services	62.08	%

Data from 2014

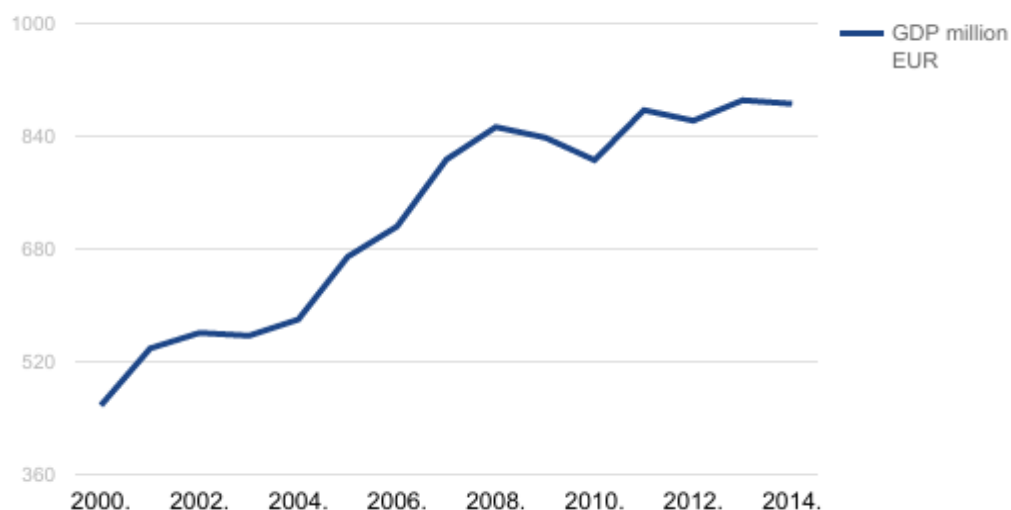
##### **Regional economy**

Pleven region recorded lower gross domestic product per capita for the period 2000-2014 than the national average. There is even the opposite trend - over the years, GDP per capita in the field are increasingly moving away from the national average.

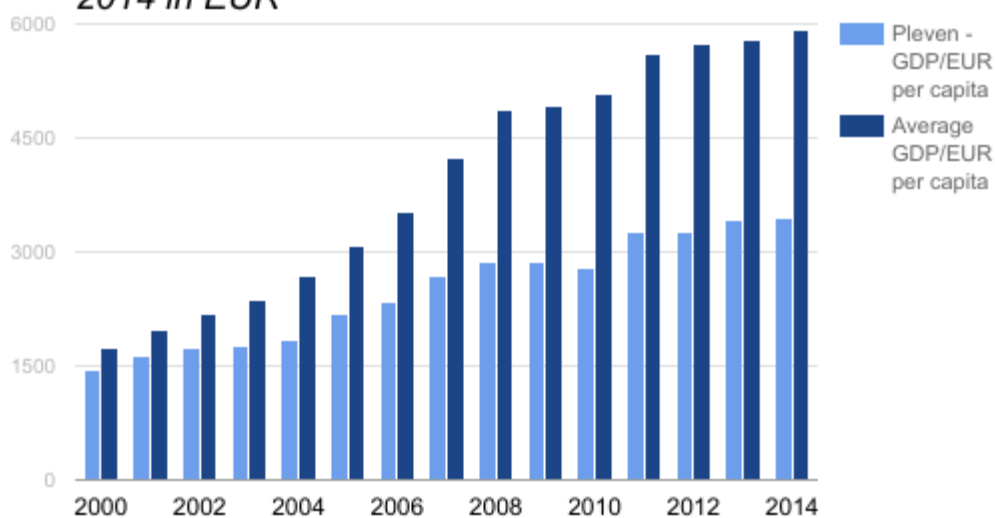
Before 2008, and especially during the financial crisis, foreign direct investment in the area are extremely low. They barely reach 532 euros per 1,000 people in 2010 and far behind the national average € 2,935. Fortunately<sup>4</sup>, in recent years, investment activity is improving and is higher than pre-crisis, but still remains below the national average. The managing of European funds is relatively good, but the level of local taxes remain among the highest in the country.

<sup>4</sup> Regional profiles, Pleven 2015

*GDP of Pleven region for 2000-2014.*



*Comparison between Pleven region and the national average GDP per capita for 2000-2014 in EUR*



Number of operating enterprises*	9674	
Share of small and middle size enterprises*	7.9	%
Number of operating NGOs	15	
Funding by EU (2007-13)	35,469,973	EUR

\*Data from 2015

### **The most profitable economic sectors**

The service sector is the leading one in the region with 490 million euro GDP for 2014 year. It's over two times more profitable than the next, namely the industry with 220 million, which is also more unstable. Agriculture is third with 78 million.<sup>5</sup>

### **Market labor**

In recent years there has been an improvement in unemployment. The number of employed aged between 15-65g rose from 54.1% to 61.2%. The share of employees by sectors, the total number of employees is as follows: "Manufacturing" - 29.0%; "Trade; repair of motor vehicles and motorcycles" - 14.8%; "Education" - 9.9%; "Human health and social work activities" - 9.5%; "Agriculture, forestry and fishing" - 6.9% In number of persons employed under labor contract in 2015, the region occupies 10th place among the 28 regions in the country<sup>6</sup>.

## **5. National and local energy strategies**

### **At national level:**

- Energy strategy of Republic of Bulgaria by 2020. - for secure, efficient and clean energy
- Law on Energy
- Energy Efficiency Act of the Republic of Bulgaria (since 15 May 2015)
- National Energy Efficiency Action Plan 2014-2020
- Renewable Sources Act
- National Renewable Energy Action (December 2012)
- Climate Change Mitigation Act
- Sixth National Communication report on Climate Change

### **At Regional level:**

There are no energy strategies at such level in Bulgaria. The focus is only on national and municipal level.

### **At Municipal level:**

There are obligatory regulations for all the municipalities but at the same time only 11 of 265 municipalities already adopted such strategies. This is a result of the "black holes" in the national regulation, where indicative terms are missing and the responsibility is not fixed. There is not even one municipality in the Pleven region that had been adopted renewable energy development strategy and there is no members of Covenant of Mayors in the region.

<sup>5</sup> National Statistical Institute, regional statistics, GDP and GVA for 2014

<sup>6</sup> Employees and average gross annual salary in Pleven in 2015



## 6. Energy Production

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

Name & Location (city, town)	Owner	Year of commissioning (refurbishment)	Type of plant & fuel	Capacity in MW	Annual energy production in MWh	Annual CO <sub>2</sub> -emissions in t	Utilization rate (qualitative assessment)
Pleven - Pleven city	Public / private SME		TPP - natural gas	36MW electric; 466MW - heat	421, 317MWh	14,06	Constantly used

As stated earlier the region relies mainly on the national electricity system for its electricity. The only TPP in the region - “Pleven” produces electricity for the local industrial needs and it also supplies the city of Pleven centrally with heat. The heat transmission network has a total length of 180 km.

### 6.2. Renewable energy production

#### Energy production capacities

Name & Location (city, town)	Owner	Year of commissioning (refurbishment)	Type of plant & fuel	Capacity in MW	Annual energy production in MWh	Annual CO <sub>2</sub> -emissions in t	Utilization rate (qualitative assessment)
Rakita - Rakita village	private SME	1968	HPP - water	3,15MW			Constantly used
Espe Energy - Milkovica village	private SME	2012	PV system	5MW			Constantly used
Development - Somovit village	private SME	2012	Wind turbine	4,5MW			Constantly used

The region has one of the better results in the country at transitioning to renewable energy production. Due to the big water resources five hydro power plants, with a total capacity of 6MW, were built in the last century. The largest one being “Rakita” HPP with 3,15MW.

In recent years around 20 small-scale PV and wind turbine facilities (3-5MW) were built with the help of EU funds. Their total capacity is 66MW. Most of them are PV and are owned by private SME.

The trends suggest bigger increase in the use of solar and wind energy. With the main focus on small PV facilities with 1-3MW capacity.

All of hydro power plants were built in the 60s-70s of the previous century. They are maintained well but still require some modernisation.

### 6.3. Transmission and distributions

The transmission and distribution system is constituted by electrical substations, transformer stations and transmission lines. Currently the Electricity System Operator is owning these systems. As for the operators, “CEZ Distribution Bulgaria” is responsible for that at the moment.

The territory of Pleven region is crossed by a “South Stream” gas pipeline carrying gas from Russia through Bulgaria to Central Europe. There is also a local pipeline system, which is mainly supplying large industrial consumers, including the TPP “Pleven”

The energy produced in Pleven region is mainly used for local needs. The only facility that would supply with energy the rest of the country had its project shut down.

#### 6.4. Jobs in the energy sector

The energy sector is one of the least developed the region right now. There are however more and more renewable energy facilities built and a big growth potential. The sector had 513 employees as for 2013, according to the last available data<sup>7</sup>. This doesn't include the green jobs, because a statistic for them is not kept on regional level.

There aren't coal and lignite deposits in the region. As for the fossil fuel mining, the oil and natural gas fields are already exhausted and the region is dependent on supplies from elsewhere.

## 7. Final energy consumption

### 7.1. Households

Regional final energy consumption of household sector	1390	GWh
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#### Heat consumption

Total heat energy consumption of households sector (heating and hot water consumption)	1004	GWh
Average heat energy consumption per household	8765	kWh/hh

**Most of the available building statistics are on national level. The buildings in Bulgaria are mainly built in five ways:<sup>8</sup>**

- panels that are assembled together(22%)
- reinforced concrete structure with slab and columns(9%);
- bricks with a concrete slab between the floors(37%)
- bricks with beam work without reinforced concrete(26%)
- others(6%) - buildings built of stone, brick, wood, boards, wooden boards.

**The share of residential buildings by the year of construction is as follows:**

- 15% of the buildings are built between 1919-1945
- 27% between 1946-1960
- 19% between 1961-1970
- 15%- 1971-1980,
- 12%- 1981-1990,
- 5%- 1991-2000
- 4%- 2001-2010.

**As for their energy consumption:**

- the panel buildings have 200 kWh/m<sup>2</sup> yearly
- buildings with external brick walls 38 cm thick built before 1965 - 170 kWh/m<sup>2</sup> yearly
- buildings with exterior brick walls 25 cm thick built between 1965-1999 - 180 kWh/m<sup>2</sup> yearly.

There're programs for increasing the energy efficiency of the buildings at municipal level.

<sup>7</sup> National Statistical Institute, Macroeconomic statistics, Employment and Hours worked by regions , Employed Persons by regions

<sup>8</sup> NATIONAL LONG-TERM PROGRAMME for the promotion of investments in measures aimed at improving the energy performance of the national stock of public and private residential and commercial buildings 2016–2020, pages 26 and 27

**Electricity**

Electricity consumption of households	380	GWh
Average electricity consumption per household	3317	kWh/hh

**Cooking**

Gas consumption for cooking appliances of households	5	GWh
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*Gas is rarely used for cooking in the region, most of the households are using electricity.*

**General information**

Household electricity price	0,11	EUR/kWh (incl. taxes)
Household natural gas price	0,044	EUR/kWh (incl. taxes)
Household district heating price	0,04	EUR/kWh (incl. taxes)
Household price: other energy sources – specify:		EUR/kWh (incl. taxes)
Energy expenditure by household	19,46	% of income

*In Bulgaria the price of the electricity has two rates, one for the day (6:00-22:00) and one for the night (22:00-6:00). Currently the night rate is more than twice cheaper, it costs 2.79 euro cents per kWh.*

**Energy poverty**

*Unfortunately there is no regional data on the topic.*

***Estimation of the trend in final energy consumption in the household sector using values from -5- to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).***

*No regional data available.*

**7.2. Service Sector**

Regional final energy consumption of service sector	218	GWh
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*Data for energy consumption per sub-sector is not available.*

*The service sector is very important to the regional economy as it represents 62.5% of the GDP.*

***Estimation of the trend in final energy consumption in the service sector using values from -5- to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).***

*+1 (2010-2015)*

### 7.3. Industry

Total energy consumption of the industrial sector	622	GWh
Industry electricity price	0,12	EUR/kWh (incl. taxes)
Industry natural gas price	0,04	EUR/kWh (incl. taxes)
Household district heating price	0,04	EUR/kWh (incl. taxes)
Household price: other energy sources – specify:		EUR/kWh (incl. taxes)

*Data for energy consumption per sub-sector is not available.*

*Industry is the second biggest sector in the region with 26.56% of the GDP. However its growth has stagnated in the last couple of years.*

### 7.4. Transport

Regional final energy consumption of transport sector	1218	GWh
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*The density of the road network in the area is slightly lower than the average for the country of 17.8 km per 100km<sup>2</sup> and that of the railway lines is 4.4 km per 100km<sup>2</sup> with an average level of 3.6 km per 100 km<sup>2</sup>. Although the share of motorways and first-class roads is relatively low, the quality of road pavements in the area is close to that of the country - as of 2015 in good condition are 39.0% of the roads. Highway E-83 "Sofia-Pleven-Byala-Ruse" also passes thru the region's territory, which is of great importance for the integration of the region in the national and European road network.*

#### **Passenger transport**

Motorisation rate - number of passenger cars/1 000 inhabitants	117.82	
Regional energy consumption of passenger transport	1021	GWh

#### **Freight transport**

Regional energy consumption of road freight transport	181	GWh
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*The total length of railway lines in the area is 206 km. The density of the railway network in the area is 44.28% and is among the highest in the country.*

#### **Use of alternative fuels**

*The market for alternative fuel vehicles is still in its beginning on national level and is basically non-existent in the region.*

*As for support mechanisms, there is a long-term program that promotes consumption of biofuels on national level.*

*There're are a lot of challenges and barriers right now. Except for two or three big cities in the country an infrastructure for electric cars is not available yet. The price of these vehicles is also a lot higher*

**Estimation of the trend in final energy consumption in the transport sector using values from -5- to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth). +1(2010-2015)**

## 7.5. Summary

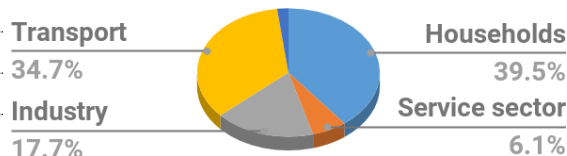
### 7.5.1. Final energy indicators

#### General indicators for the region

Total final energy consumption	3445	GWh
Final energy consumption per capita	13,949	kWh/cap
Electricity consumption per capita	3,990	kWh/cap
Heat consumption per capita	4,422	kWh/cap
% of total country consumption	1.9	%

#### Final energy consumption per sector

Year: 2015			%
Households	1390	GWh	39,5%
Service sector	215	GWh	6,1%
Industry	622	GWh	17,7%
Transport	1218	GWh	34,7%
Agriculture, Fishing and Other	70	GWh	2%
Sum	3515	GWh	100,0%



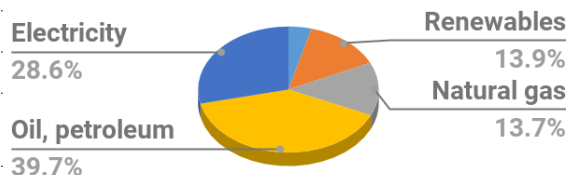
**Estimation of the trend in final energy consumption using values from -5- to +5 (where -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).**

0 (2010-2015)

### 7.5.2. Final energy consumption by fuel

#### Total final energy consumption by fuel

Year: 2015			%
Coal and lignite	144,11	GWh	4,1%
Renewables and waste*	488,58	GWh	13,9%
Natural gas	481,56	GWh	13,7%
Oil, petroleum and products	1395,45	GWh	39,7%
Electricity	1005,3	GWh	28,6%
Other fuels	0,00	GWh	0%
Sum	3515,00	GWh	100,0%



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

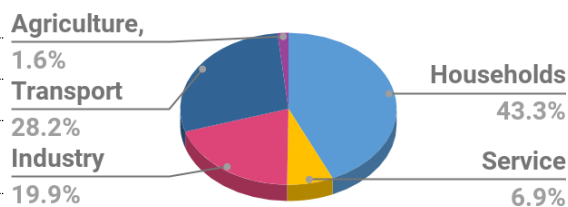


### 7.5.3. Primary energy equivalent

Total Primary Energy Consumption	3639.04	GWh
Primary energy consumption per capita	14441.4	kWh/cap
Primary energy factor of electricity	2.5	-
Energy intensity	5.35	kWh/1000 EUR

### Primary energy equivalent by sector

Year: 2015			%
Households	2054.40	GWh	43.3%
Service sector	326.80	GWh	6.9%
Industry	945.44	GWh	19.9%
Transport	1339.80	GWh	28.2%
Agriculture, Fishing and Other	77.00	GWh	1.6%
Sum	4743.44	GWh	100,0%



**Level of primary energy supply dependencies: Which fuels need to be imported from the rest of the country and internationally.**

Dependency on fuel supply: high

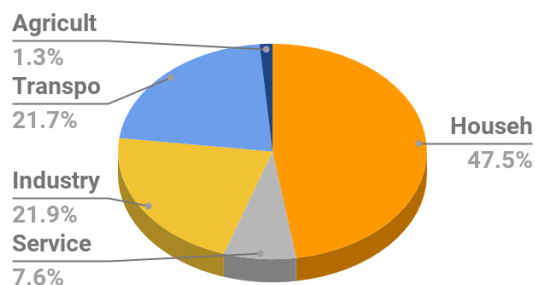
The region depends on import for all of its conventional fuels.

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

Total CO <sub>2</sub> -emission associated with energy sector	1.10	Mio t
CO <sub>2</sub> -emissions per capita	4.36	t/cap
CO <sub>2</sub> -emissions per GDP	0.0015	t/€ GDP

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

Year: 2015			%
Households	666,516	t CO <sub>2</sub>	47.5%
Service sector	106,084	t CO <sub>2</sub>	7.6%
Industry	306,905	t CO <sub>2</sub>	21.9%
Transport	303,867	t CO <sub>2</sub>	21.7%
Agriculture, Fishing and Other	18,673	t CO <sub>2</sub>	1.3%
Sum	1,402,045	t CO <sub>2</sub>	100,0%



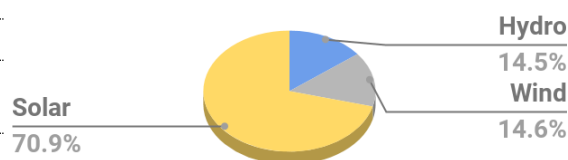
## 8. Renewable energy sources – status and potential

### 8.1. General information

Renewable Energy Targets:		
2020 RES share in gross final energy consumption	16	%
2030 RES share in gross final energy consumption	16	%
Current RES share (2015)	18.2	%
thereof RES out of the region	18.2	%

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

Year: 2015			%
Hydro	70.89	GWh	14.5
Wind	71.25	GWh	14.6
Biomass, biofuels and renewable wastes	0.0008	GWh	0
Solar	346.43	GWh	70.9
Geothermal	0	GWh	0
Tide, Wave, Ocean	0	GWh	0
Sum	488.58	GWh	100,0%



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

The only available information is for the overall share of electric demand covered by such fuels, which is 19.1%. There is no information of the distribution between the different RES.

#### Renewable energy sources in the transport sector

Still not integrated

#### Status of REN production in the region. % of total energy and electricity demand covered by REN. Historic overview of the REN production capacities for the last 5 to 10 years.

When it comes electricity production, hydropower plants are historically the most used facilities. However in the last ten to fifteen years wind and especially solar energy production began to grow rapidly. The main reason for this growth are the subsidies from EU programs. And now solar energy is around five times more than the rest RES and wind turbines have barely overtaken hydropower plants.

#### Incentive programmes/schemes (financial and non-financial) in place to support REN-development.

So far in Bulgaria we only have FIT schemes for the small scale roof PV under 150 KW and biogas installations. The other types of RES don't have FIT or loan interest rate from the banks at the moment.

#### Some of the regulatory barriers slowing down current and future REN-development.

- There is a lack of REN support and development at national and regional level
- No clear rules how to join to the electricity network new RES installations
- Long term energy limits for stop the planning of new RES projects and investments

- Cheaper fossil fuels
- Lack of different possibilities for public-private schemes of planning new project development
- Weak financial incentives for the final energy consumers

**Estimation of the trend in renewable energy production using values from -5- to +5 (where -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).**

+2

## 8.2. Available natural resources in the region

### 8.2.1. Biomass

**Usage of forest areas. Regional theoretical or technical potential energy potential using existing forest areas. Regulatory support systems as well as barriers.**

The total forest area of Pleven region is 47, 677 ha from which 96.5% are deciduous and 3.5% are coniferous. By type of ownership, the forest territories are divided into:

- state forest areas - 24%
- municipal forests -23%
- forests in private properties -53%

Most of the forest areas are scattered among farmland properties.

The potential is unknown.

**Main agricultural products, and their theoretical or technical potential energy potential. Regulatory support systems as well as barriers.**

Main products: cereals 59%, oilseeds 38%, vegetables and flowers 1%.

There're no biogas plants at the moment and the potential is unknown.

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

**Overview of the hydropower sources used at the moment and energy potential for the different technologies: run-of-river hydropower plants, reservoir hydropower plants, use of tide and wave power. Energy potential based on geographical and political frameworks.**

As stated above there are five relatively small hydropower plants in the region with total installed capacity of 6MW. One of them has 3.15MW installed output and the rest have below 1 MW. Even though the region is rich on water sources there is not much potential for growth.

### 8.2.3. Solar power

Solar irradiation (on optimally inclined plane) per year <sup>9</sup>	from 1600 to 1800	kWh/m <sup>2</sup>
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**Overview of both solar thermal and PV usage at the moment and the energy potential based on geographical and political frameworks.**

The total number of solar facilities is 55 with installed output of 56.8MW and it is expected to grow (potential is unknown). The region is also very suitable for PV installation according to the solar irradiation.

<sup>9</sup> Joint Research Centre, Institute for Energy and Transport, Global Irradiation and Solar Electricity Potential, Optimally-inclined photovoltaic modules

## Regional Energy Profile – Pleven

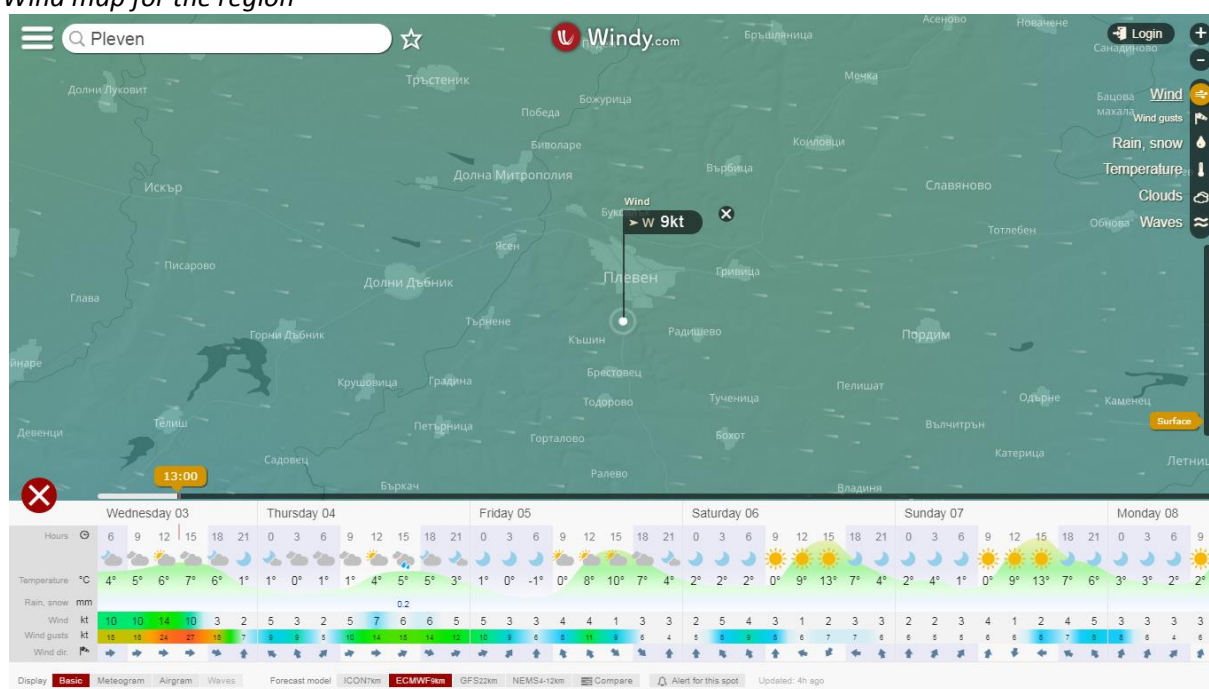
### 8.2.4. Wind power

Average wind speed	from 1.38 to 5.27	m/s
Full load hours	< 1 000	h/a

**Overview of wind power usage at the moment. Onshore energy potential based on geographical and political frameworks.**

There're only 4 wind turbines at the moment with total installed power of 10MW. They were all built in recent years. The region is suitable for further development, but the higher price compared to the solar facilities is certainly a barrier. The potential is still unknown.

Wind map for the region<sup>10</sup>



### 8.2.5. Geothermal energy

**Overview of use of geothermal energy at the moment and the energy potential based on geographical and political frameworks.**

Geothermal energy is not used for energy production at the moment. There is potential for development, but no in depth study has been made yet.

### 8.2.6. Waste

**Overlaps between waste management and energy sector.**

Bulgaria is still in the first level of waste management and we are building the regional landfills. At local level many civil society groups are against waste burning and the building of incinerators with electricity production. This sector is less likely to be developed.

<sup>10</sup> <https://www.windy.com/43.409/24.618?42.952,24.620,8,m:eRvagQc>

#### 8.2.7. Other natural resources

#### 8.2.8. Restriction through protected areas

*The network of protected natural areas in the area includes one nature park, two nature reserves, one managed reserve, 28 protected areas and 19 nature landmarks. The relative share of these areas amounts to 22.32% of the territory of Pleven region.*

## 9. Energy efficiency – status and potential

### **Status of the implementation of the Energy Efficiency Directive**

*In the National Energy Efficiency Action plan from 2014, Bulgaria set 2020 goals for savings towards final energy consumption at 29.97 PJ (716 ktoe) and at 66.57 PJ (1590 ktoe) for savings from primary energy consumption. The goal for primary energy consumption is set at 706.3 PJ (16 870 ktoe) and at 361.69 PJ (8 639 ktoe) for final energy consumption.<sup>11</sup>*

*An Energy Efficiency Act was also adopted in 2015.*

### **Status of the implementation of the Energy Performance of Buildings Directive.**

*The National Energy Efficiency Action plan for 2014-2020 also covers energy efficiency in buildings. A priority of the National Renovation Programme for Residential Buildings in Bulgaria are multi-family residential buildings. The average energy savings expected from the implementation of the energy-efficiency measures included in the Programme are between 25-35 kWh/m<sup>2</sup><sup>12</sup>*

### **Analysis of the sectors:**

#### **Households: energy efficiency measures implemented in this sector. Financial and non-financial support for the implementation.**

*There are numerous energy efficiency programs running mostly on municipal level and most of them provide financial support.*

*Energy renovation of Bulgarian homes was launched in July 2012 with the financial support of Operational Programme 'Regional Development 2007–2013', which is co-financed by the European Union through the European Regional Development Fund.*

#### **Service sector:**

*With the potential of the different operational EU programs many SME could apply for new EE measures about their business. We can say that the service and industry sectors are equal in this regard.*

#### **Industry: energy efficiency measures implemented in this sector. Support for the implementation (financial and non-financial).<sup>13</sup>**

*Few programs that support the industry have been launched so far. First of them Investments in green industry. Its main objective is to provide investment support to large enterprises in Bulgaria, directly related to the reduction of their energy and resource intensity.*

*Energy efficiency and green economy is also being implemented. Its main objective is to provide investment support and advice to Bulgarian micro, small and medium-sized enterprises in their transition to a green economy. The procedure combines a grant component (non-repayable aid) and a loan component – additional funding provided by the European Bank.*

<sup>11</sup> National Energy Efficiency Action Plan, pages 13-19

<sup>12</sup> National Energy Efficiency Action Plan, pages 63 and 64

<sup>13</sup> National Energy Efficiency Action Plan, pages 49 and 50



**Transportation: efficiency measures implemented in this sector. Support for the implementation (financial and non-financial)<sup>14</sup>**

There are legislative measures that include:

- suppliers of liquid transport fuels to reduce GHG emissions per energy unit of liquid fuels delivered against a fixed baseline level and reach an overall reduction of 6 % by 31 December 2020
- suppliers of petroleum-derived liquid transport fuels to supply fuels for diesel and petrol engines blended with biofuels in certain proportions.

Some of the strategic measures include:

- rehabilitation and modernisation of the road infrastructure -
- implementation of intelligent transport systems on national roads and in urban environments
- increased share of biofuels
- develop and promote the use of bicycles

**Estimation of the trend in energy efficiency development using values from -5- to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).**

+2

## 10. Typical funding of energy efficiency and renewable energy projects

**The following instruments were used for the 2007-2013 programme period:**

- **Operational Programme "Competitiveness of the Bulgarian Economy"** had two grant procedures providing finance for the businesses. The first one was for energy efficiency in large enterprises, and the second one was for both energy efficiency and RES in small and medium enterprises. The grant covered no more than 50% of the project costs.
- **Operational Programme "Regional Development"**, which granted financing for energy efficiency in public institutions, equal or less than 85% of the project costs.
- **"Rural Development Programme 2007-2013"** granted financing for energy efficiency and RES. For energy efficiency projects it covered up to 100% of the costs for municipalities and public non-profit organizations, and from 50-70% for the private companies depending on their size. It also covered up to 80% of the project costs for construction of new RES.
- **Bulgarian Energy Efficiency and Renewable Energy Credit Line (BEERECL)**, which provided financing through loans provided by Bulgarian financial institutions to private companies for projects in energy efficiency or RES. The loan itself was up to 2.5 mil EUR and upon a successful project, grant up to 15% of the principal on the loan was received.
- **Programme BG04 "Energy Efficiency and Renewable Energy"** also provides financing for both energy efficiency and RES. The grant's percentage differentiates for the four procedures.
  1. Small HPPs, which water source is irrigation and water supply systems - up to 90%.
  2. EE and use of RES for heating in municipal and state buildings (up to 100%) and local heating systems (up to 60%).
  3. Using RES for heating – same as above.
  4. Enhancing the administrative capacity and the awareness of EE and RES – up to 90%.
- **Energy Efficiency and Renewable Sources Fund (EERSF)**, that was created in 2004 is still operating. It is a lending institution, a credit guarantee facility and a consulting center. The

<sup>14</sup> National Long-term Programme to Encourage the Use of Biofuels in the Transport Sector 2008-2020

equity contribution of the borrower should be at least 10% under a co-financing scheme between EERSF and a commercial bank and 25% for EERSF stand-alone financing.

- **Residential Energy Efficiency Credit Line (REECL)** provides households and housing associations the opportunity to receive loans and grants to increase the energy efficiency of their property. Upon receipt of the loan from a Bulgarian financial institution and after the completion of the project 20%, 30% or 35% of its costs are received as a grant.

**These are the instruments that are used in the current 2014-2020 programme period:**

- **Operational Programme “Regions in Growth”**, which finances energy efficiency projects with beneficiaries of municipalities, homeowners and housing associations. The grant which is provided equals to 100% of the project costs, where 85% of which comes from the “European Regional Development Fund” and the rest 15% comes from national co-financing.

- **Energy Efficiency of Multi-Family Residential Buildings National Program** is aimed at the renovation of multifamily residential buildings and increasing their energy efficiency. The housing associations can receive a nationally funded grant that covers up to 100% of their costs.

- **Energy Efficiency and Renewable Sources Fund (EERSF)**, which was mentioned above.

- **Residential Energy Efficiency Credit Line (Second Frame Extension)** still provides access to loans from Bulgarian financial institutions, but this time the grant is equal to 10% of the project costs for houses with one or two dwellings, and 20% for projects in multi-family residential buildings with more than three separate dwellings. The grant is received upon completion of the project and after verification of their performance by an independent consultant.

- **Financial Mechanism of the European Economic Area (Norwegian Financial Mechanism) 2014-2021.** A memorandum for the execution of these financial mechanisms was signed with Bulgaria in December 2016. The main donors are Norway, Iceland and Liechtenstein. The mechanism provides grants for projects related to renewable energy, energy efficiency and energy security. The grant itself can't exceed 85% (70.13% are from the Norwegian Financial Mechanism and 14.87% are from national financing) of the project costs, except for NGOs where it can go up to 90%. Further requirement is for a maximum investment of EUR 150 per tonne of CO2 equivalent reduced / avoided yearly.

- **“Rural Development Programme 2014-2020”** provides financing for both energy efficiency and renewable energy in agriculture, food industry and forestry. The received grant shouldn't exceed 85% (with some exceptions) of project costs.

## 11.SWOT analysis

*The region towards development into a low-carbon economy in 2050.*

### Strengths

- High RES potential
- The environment is in a good shape
- Good results and examples are already existing

### Weaknesses

- The economic is lagging behind
- Lack of researches and energy data
- Lack of energy planning on regional level
- Not all available RES are used
- Aging population
- Since 80s province of Pleven has only nuclear development focus

### Opportunities

- Studying the potential use of geothermal energy
- Using waste and biomass as energy sources
- Further development and strengthening of the RES that are already in use
- Developing an infrastructure for electric cars

### Threats

- Lack of investments due to political and economic instability
- Slowing down the growth of RES usage due to lack of stimulating regulations
- Underestimating the capabilities of projects funded by EU funds from national operational programs

### Assess of the following trends:

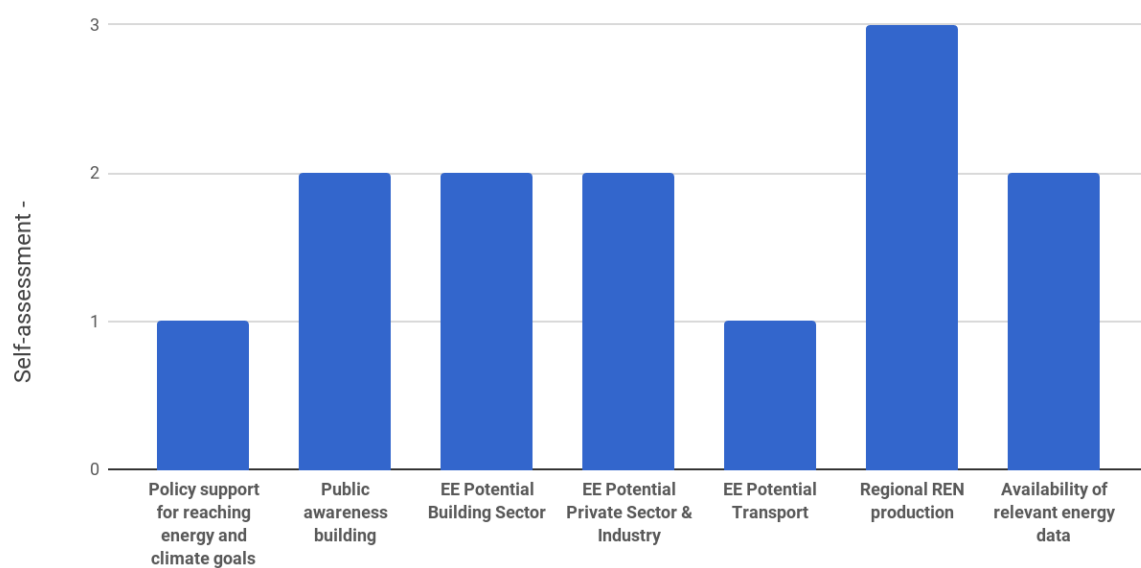
- Policy Support for reaching energy and climate goals
- Public awareness building
- EE Potential Households
- EE Potential Private Sector & Industry
- EE Potential Transport
- Regional REN production
- Availability of relevant energy data

### Points:

1 ... no measures set/ potential unused

to

5 ... fully developed/ potential fully used



Regional Energy Sector Assessment

## 12. Annex: List of sources

1. <http://www.nsi.bg/en/content/11460/district-pleven> - Statistics
2. <http://www.regionalprofiles.bg/var/docs/Profiles-2016-EN/12-Pleven-District-ENG.pdf> - Socio-Economic Development
3. [https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x\\_2=1083](https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=1083) -Population
4. [https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x\\_2=1262](https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=1262) -GDP
5. [http://www.regionalprofiles.bg/var/docs/Profiles-2012-EN/Pleven\\_2012\\_EN.pdf](http://www.regionalprofiles.bg/var/docs/Profiles-2012-EN/Pleven_2012_EN.pdf) - Investments
6. <http://www.nsi.bg/en/content/5493/gdp-regions> - Leading economic sectors
7. <http://www.nsi.bg/en/content/5528/employed-persons-regions> -Sector Employment
8. [https://ec.europa.eu/energy/sites/ener/files/documents/bg\\_building\\_renov\\_2017\\_annex\\_6\\_of\\_neeap\\_en.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/bg_building_renov_2017_annex_6_of_neeap_en.pdf) - NATIONAL LONG-TERM PROGRAMME for the promotion of investments in measures aimed at improving the energy performance of the national stock of public and private residential and commercial buildings 2016–2020
9. [http://www.regionalprofiles.bg/var/docs/Profiles-2016/15\\_Pleven.pdf](http://www.regionalprofiles.bg/var/docs/Profiles-2016/15_Pleven.pdf) - Transport infrastructure
10. [http://re.jrc.ec.europa.eu/pvgis/cmeps/eu/cmsaf\\_opt/G\\_opt\\_BG.png](http://re.jrc.ec.europa.eu/pvgis/cmeps/eu/cmsaf_opt/G_opt_BG.png) – Solar power, Solar irradiation
11. [http://www.eea.europa.eu/publications/europes-onshore-and-offshore-wind-energy-potential/at\\_download/file](http://www.eea.europa.eu/publications/europes-onshore-and-offshore-wind-energy-potential/at_download/file) - Wind Power, Full load hours
12. [http://www.seea.government.bg/documents/2014\\_neeap\\_en\\_bulgaria.pdf](http://www.seea.government.bg/documents/2014_neeap_en_bulgaria.pdf) - National Energy Efficiency Action Plan
13. file:///C:/Users/user/Downloads/Biofuels\_Program\_EN.pdf - Biofuels



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