

Montenegro

Country Profile

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1. Overview of Electricity Supply

As part of the Western Balkan region, Montenegro's energy sector suffered during the violent conflicts of the 1990's. Much of the sector requires significant domestic and foreign investment to refurbish the existing infrastructure (IEA, 2008).

Montenegro mainly uses hydropower and their indigenous lignite as domestic sources of energy. The country shows some small potential for offshore oil and gas, but the potential has not yet been developed. Montenegro also has some major energy inefficiencies. In fact, their energy efficiency savings could amount to about 20 percent of current consumption. Savings could take place in all major sectors of energy: production, transmission and distribution (IEA, 2009).

The energy sector in Montenegro is comprised of the following holding companies: Electric Power Company of Montenegro (Nikšić), Coal Mine Holding Company (Pljevlja), Brown Coal Mine Holding Company (Ivangrad - Berane), and Petrol Holding Company (Kotor). The driving force in the energy sector is the Energy Policy of Montenegro and the Energy Development Strategy of Montenegro by 2025 (Ministry for Economic Development, 2009).

The table below displays summary information about Montenegro.

Demographical Information	
Population, thousands (2009)	672
Land area, thousand sq. km (2009)	14.0
Macroeconomic Information (2008)	
GDP, billion US\$	6.6
Real GDP growth rate, percent	6.5
Foreign direct investment (net), million US\$ (2007)	719
Electricity disposition, billion kWh (2006)	
Generation	2.86
Consumption	18.6
Exports	0.0
Imports	0.0
Generation capacity, GW (2005)	
Nuclear	NA
Thermal	NA
Hydro	NA
Other renewables	NA
Total	NA
<i>Sources: CIA World Factbook, U.S. Energy Information Administration, United Nations Conference on Trade and Development.</i>	

Montenegro Country Summary Table

The electricity grid of Montenegro is displayed below.

Montenegro Electricity Grid



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2. Energy Policy, Barriers and Incentives

As an active participant in the EU integration process, Montenegro supports the EU objectives set in January 2007. They will strive to reduce greenhouse gases emissions by 20 percent, increase energy efficiency and reduce energy consumption by 20 percent, raise their share of renewable energy sources to 20 percent, and raise their share of biofuels at least 10 percent all by the year 2020 (Ministry of Economic Development, 2009).

The National Energy Development Strategy until 2025, which was adopted in December 2007, is the key document for identifying investment opportunities in the energy sector. This

strategy includes provisions for explorations of potential small hydro power sites and a design study for wind power plant development. The strategy also works to eliminate barriers to enable utilization of renewable energy resources.

Montenegro's Energy Law is another important part of the country's energy policy. The law established the Government as the responsible party for promoting a competitive energy market. It regulates the generation, transmission, distribution and supply of electricity in the market or as a Public Service. It also regulates petroleum products and gas as well as the production and market for coal use for electricity generation. This law does not apply to coal exploration or petroleum refining.

The objectives of the Energy Law are to ensure safe, secure, reliable, quality energy at fair prices. The law takes into account environmental protection, efficient use of energy, promotion of market competition, promotion of private sector participation, and integration of the energy sector activities in Montenegro with the rest of Europe (Vujosevic, 2007).

The Legal Unbundling of the Electric Power Company of Montenegro Law is underway, so is the development of an electricity market law. Also, the Law on Energy Efficiency is in the final stages of development (Ministry of Economic Development, 2009).

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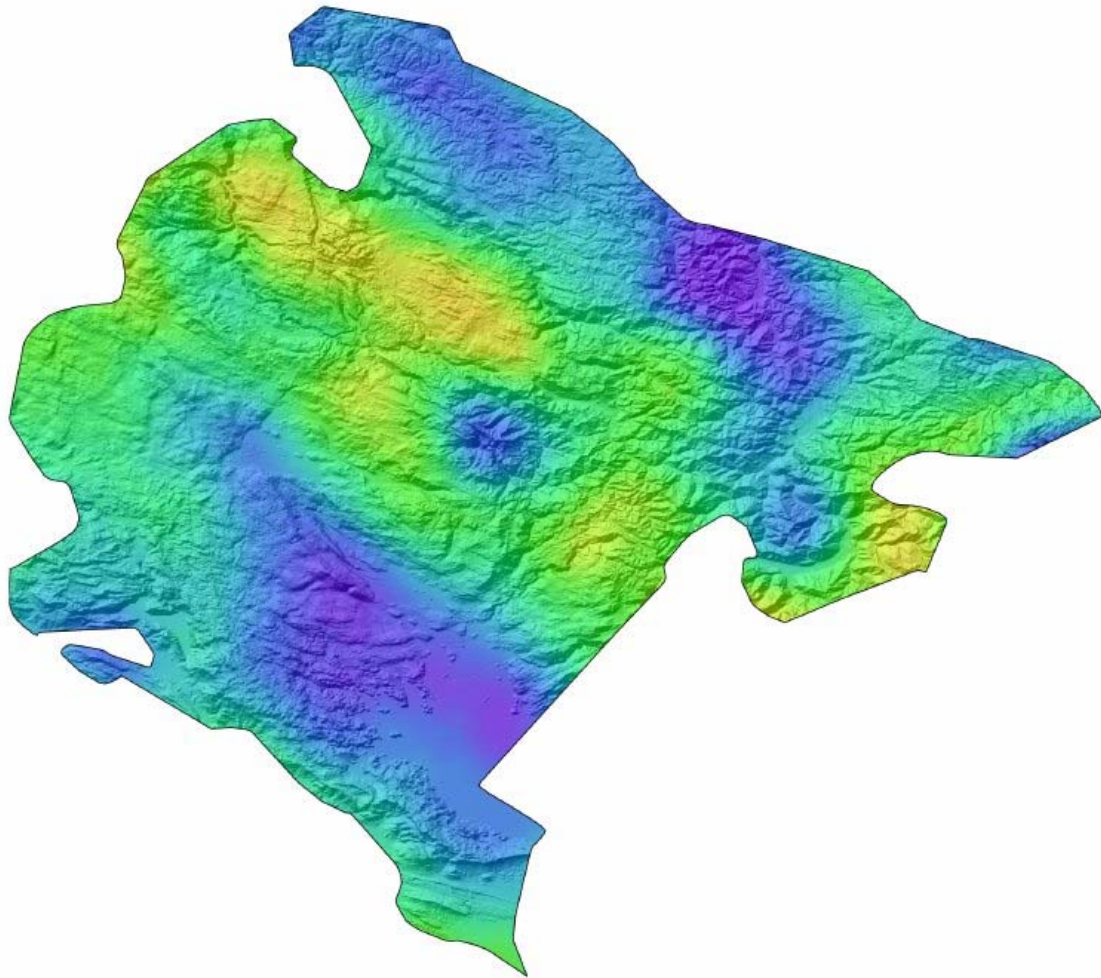
3. Wind

Wind data is insufficient for any substantial use of wind energy at this time; however with the information available, general locations with good resource can be determined. Locations are in the vicinity of Niksic, in the southwestern region of the country, and in the Coastal region all have good wind energy potential (Ministry of Economy, 2006).

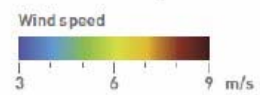
Montenegro's only wind installation, the Ilino Brdo (260 kW), was recently retired, so Montenegro currently has no operating or planned wind installations (UDI, 2009).

Montenegro Wind Resource Map (Source: 3Tier)

Montenegro Wind Map at 80m



5km Wind Map at 80m



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4. Biomass

Montenegro is believed to have great biomass potential. Studies have estimated wood biomass potential as 2.6 m³/ha per year. Over 30,000 cubic meters of wood scraps and 33,000 cubic meters of saw mill scraps could be used for energy production annually. Preliminary studies are being completed to assess the feasibility of a 2, 5 or 10 MW biomass power plant (Ministry for Economic Development, 2007).

Montenegro is also looking into the possibility of utilizing industrial waste for energy. An estimated 200,000 - 250,000 tons are formed in Montenegro each year. Preliminary feasibility studies are underway to look at heat and electric producing facilities that burn solid waste (Ministry for Economic Development, 2007).

Montenegro Biomass Resource Data

Biomass resource type	Total production	Production density
Total land area covered by	(avg. 2006–2007, km ²)	(avg. 2006–2007, %)
Arable Land	1,740	13
Permanent Crops	160	1
Permanent Meadows and Pastures	3,245	23
Forest Area	6,242	45
Other Land	2,064	15
Inland Water	360	3
Primary crop production	(avg. 2006–2007, tonne)	(tonne / 100 km ²)
Total primary crops (rank among COO)	337,472 (2)	2,421 (9)
Top 10 primary crops		
Potatoes	13,192	943
Watermelons	41,383	297
Grapes	41,363	297
Cabbages and other brassicas	29,907	215
Tomatoes	22,254	160
Chilies and peppers, green	16,886	121
Maize	9,033	65
Oranges	7,200	52
Plums and sloes	5,521	40
Apples	4,933	35
Animal units, number	(avg. 2006–2007, number)	(number / 100 km ²)
Cattle	116382	824
Poultry	455500	3221
Pigs	11996	95
Equivalent animal units	125735	0
Annual roundwood production	(2006–2007, m ³)	(m ³ / 100 km ²)
Total	457,000	3,278
Fuel	265,000	1,901
Industrial	192,000	1,377
Wood-based panels	0	0
	(2006–2007, tonne)	(tonne / 100 km ²)
Paper and paperboard	0	0
Recovered paper	NA	NA

Source: Food and Agriculture Organization of the United Nations

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5. Solar

As in the case of other countries in the area, solar levels in Montenegro are among the highest in Europe. The most favorable areas record a large number of hours of sunlight, with the yearly ratio of actual irradiation to the total possible irradiation reaching approximately 50

percent. Of course, the monthly distribution is particularly important in determining utilization for heating; and whether back-up systems will be needed during periods of extended cloudiness.

The total potential for solar active technologies has been estimated to be approximately 50-60 percent of heating demand in the cloudier central regions. More studies need to be completed to determine Montenegro's solar potential.

Montenegro Solar Direct Normal Insolation (Source: NASA)



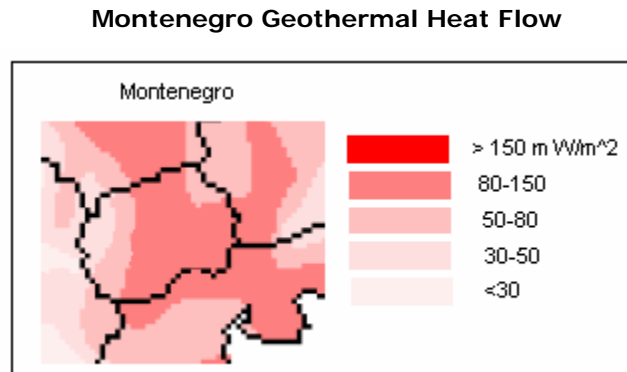
Montenegro Solar Global Horizontal Irradiance (Source: NASA)



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6. Geothermal

As shown in the figure below, Montenegro has medium temperature geothermal resource throughout a majority of the country. Thus far, this potential has neither been researched nor developed.



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7. Hydroelectric

Montenegro currently has approximately 680 MW of hydroelectric capacity. A majority of its capacity, 360 MW, comes from the Piva power plant. Piva was completed in 1976 and is one of the newer hydroelectric plants in Montenegro. Many of the power plants were installed in the 1950's and 1960's (UDI, 2009).

Montenegro has about 1,490 MW of planned hydroelectric capacity. Much of the capacity is planned to be operating by 2013 (UDI, 2009).

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8. Relevant Links

Please see webpage for relevant links.

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9. References

Republic of Montenegro Ministry of Economy, "Potentials of Renewable Energy Resources in Montenegro," November 2006.

UDI, "World Electric Power Plants Database," June 2009.

Ministry for Economic Development, "Renewable Energy Resources in Montenegro," November 2007.

Ministry of Economic Development, "Energy Sector Development in Montenegro: Reforms, Goals and Overall Strategy," Presentation given in March 2009.

Vujosevic, I., "A Brief Background Note on the Power Sector Reforms in Montenegro," University of Montenegro, 2007.

International Energy Administration (IEA), "Montenegro Country Blurb," 2009. Available online: www.iea.org.

International Energy Administration (IEA), "Energy in the Western Balkans - The Path to Reform and Reconstruction," 2008.

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10. Country Contacts

Contacts made in the preparation of this assessment are gratefully thanked for their contribution to this report. Please see webpage for contacts listing.

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