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# HYDRO ENERGY POTENTIAL **IN ALBANIA**

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# ALBANIA OVERVIEW



Albania is located in south-western part of Balkans peninsula, Southeast Europe. The country is linked with the rest of the world via land, sea and air routes.

Characterized by a distinct mountainous landscape, the average altitude of Albania is 700 meters above the sea. Based on the structure, composition and shape of the landscape, four physical-geographic zones are distinguished: Alps, Central Mountainous Region, Southern Mountainous Region and Western Lowland. The highest peaks are those in the Alps and the Eastern Mountains (Korabi 2751 m) and the lowest peaks are located in the western coast area.

The landscape is intersected by the valleys of Vjosa, Devoll, Osum, Shkumbin, Erzen, Mat and Drin rivers, eastward and westward, which enable the connection of Adriatic Sea with the internal part of the country and the Balkans

Albania lies in the Mediterranean climatic zone, characterized by a hot dry summer, strong sunshine and generally mild winter with abundant rainfalls. Annual average rainfall is 1430 mm. Situated along the Adriatic and Ionian Sea coast, Albania constitutes one of the key points of intersection for the roads crossing the Western Mediterranean into the Balkans and Minor Asia. Albania ensures via sea routes the connection with other world countries and that of the central regions of the Balkans Peninsula with the Adriatic coast. The Adriatic Sea and Otranto Strait stand in-between Albania and Italy.

## Albania is a Parliamentary Republic

The two main ports are located in Durrës and Vlorë.

Mother Theresa Airport is based in Rinas, 25 km from the capital city.

**The Capital City of Albania** is Tirana since 1920, with an estimate population of 1, 000, 000 inhabitants. Tirana is also the major administrative and commercial centre of the country.

**Official language** is Albanian.

**Borders:** The border via land is 720 km long, 287 km out of which are shared with Montenegro and the Republic of Kosovo in north and northwest of the country, 151 km east with the Republic of Macedonia and 282 km south and southeast with Greece. The coastline of the country is 362 km long.

**Population:** 3,162, 000 million inhabitants (source: INSTAT). Albania is estimated to be a country with a relatively young population.

**Economy:**

GDP: 6.9%.

Inflation rate: 2.2%.

Unemployment rate: 13.5%.

**Currency:** Lek (ALL) is the official currency.

# HYDROENERGETIC SOURCES IN ALBANIA



Fig.1. Main Hydro Basins

## 1. Albanian hydro-graphical territory

Albanian hydrographical territory is 44, 000 m<sup>2</sup> or 57% larger than its geographical territory.

The country has eight main rivers: Drin, Buna, Vjosa, Semani, Mati, Shkumbini, Ishmi and Erzeni. The average altitude of the hydrographical territory is about 700 m above the sea level. The total average flow of the rivers is about 1245 m<sup>3</sup>/sec.

Due to the morphological features, Albania is quite rich in rivers, with more than 152 rivers and torrents forming eight big rivers. They have a southeast-northwest flow, mainly oriented towards the Adriatic coast

The most important rivers are

Drin with 340 m<sup>3</sup>/sec, Vjosa with 210 m<sup>3</sup>/sec, Seman with 101 m<sup>3</sup>/sec, Mat with 74 m<sup>3</sup>/sec, Shkumbin with 60 m<sup>3</sup>/sec, etc

Although with small flows, their considerable cascade makes these rivers substantially important for the hydropower potential offered to the country. Consequently, Albania is seen as a country rich in water reserves and a hydropower potential that bears an important developmental role for the country.

River	Length km	Catchments area, km <sup>2</sup>	Average flow m <sup>3</sup> /s	Module of flow l/s/km <sup>2</sup>	Ratio Max/Min flow
Buna	41	5.187	320	-	5,3
Drin	285	14.173	352	24,8	5,1
Mat	115	2.441	103	42,6	9,3
Ishmi	74	673	20,9	31,0	5,9
Erzen	109	760	18,1	24,0	11,2
Shkumbin	181	2.441	61,5	25,2	13,2
Seman	281	5.649	95,7	16,9	13,7
Vjosa	272	6.706	195	29,1	7,2

Table 1. The main hydrologic characteristics of big rivers

## 2. Energy Development in Albania

Due to a five-century Ottoman occupation and other historical conditions, the declaration of independence on 28 November 1912 found Albania as a backward agrarian country, lacking any industry whatsoever. Even during King Zog period, Albania followed its track as an agrarian country, without any signs of energy development. During 1945 - 1951 period the power production amounted to an average of 10 KWh per capita.

The hydropower sector began to develop after 1952, when Selita hydro-power plant started operation, with an installed capacity of 5,000 KW. In 1958, Ulza hydropower plant started functioning with installed capacity of 25, 000 KW.

Following the construction of other three hydropower plants of Shkopet, Bistrice I and Bistrice II, as well as of Fier thermo - power plant, the power production reached 500 KWh per capita.

In 1971, 1978 and 1985, three of the biggest hydropower plants of the country: Vau i Dejës Hydropower Plant (with an installed capacity of 250 MW), Fierza Hydropower Plant (with an installed capacity of 500 MW) and Koman Hydropower Plant (with an installed capacity of 600 MW) were constructed, respectively. Other 90 small hydropower plants were constructed during this period.

No further developments of the sector have been marked from 1985 up to the year 2007. Considering the current power-supply situation, as well as the potential demand for power, the Government has set the development of the energy sector among its priorities, focusing on the development of renewable energy resources and, in particular, the hydro-power energies.

### 3.1. Big Hydropower Plants

**On Mat River** there are two operational hydropower plants, “Ulëza” HPP and “Shkopet” HPP, with an installed capacity of 49 MW.



**On Devoll River** “Banja” hydropower plant began to be constructed before 1990, with a designated capacity of 60 MW. However, only 40% of the works have been completed and the process was suspended. Actually, it is signed the concessionary contract for the construction of the HPP’s cascade on Devolli river between METE and the Austrian Company EVN AG, where it is planned to be constructed 3 (three) Hydropwer Plants “Lozhan”, “Grabove”, “Skenderbegas-Cekin” and Bania HPPs, with a total installed capacity of 319 MW.

**On Vjosa River**, it is in construction phase “Kalivaç” hydropower plant, with an installed capacity up to 100 MW.

**On Bistrica River there** are two operational hydropower plants, “Bistrica I” and “Bistrica II”, with an installed capacity of 27,5 MW.

*Table 2. Big scale Hydro Power Plants constructed in Albania.*



Nr.	Nomination of HPPs	Installed Capacity (kW)	Annual Generation capacity (kWh)
1.	Ulza HPP (Mat)	25.000	120.000.000
2.	Shkopeti HPP (Mat)	24.000	94.000.000
3.	Bistrice I HPP (Saranda)	22.500	100.000.000
4.	Vau Dejes HPP (Shkodra)	250.000	1.000.000.000
5.	Fierza HPP (Tropoja)	500.000	1.800.000.000
6.	Komani HPP (Puke)	600.000	2.000.000.000
	<b>Total</b>	<b>1.421.500</b>	<b>5.114.000.000</b>

## 3.2 Small Hydropower Plants

Albania counts 70 small existing hydropower plants with a ranging capacity from 20 KW to 9200 KW. Only 38 out of this total are currently operational, whereas the rest are out of function.

Out of the total of small hydropower plants:

- 32 HPP-s operate on concessionary contracts, with an installed capacity of 24,4 MW
- 16 HPP-s have been privatized and operate with an installed capacity of 2,047 MW
- 22 HPP-s are owned by the State with an installed capacity of 11,0 MW

The purpose of the construction of such small hydropower plants was the energy supply of the remote mountain areas. They were supposed to be derivational hydropower plants and make use of the water flows close to these areas.

## 4. Actual situation

After the approval of the Concessionary Law in 2006 and the establishment of the relevant structures, a special focus was set on the water resources exploitation for energy production, granting by concession as unsolicited offers the most part of Albanian water cascades.

During the years 2007-2011 approximately 230 unsolicited project-proposals were presented to METE by mainly domestic private investors.

Beginning from the year 2002 up to date 105 concessionary contracts are signed for the construction of 293 Hydropower Plants, with a total capacity of 1296 MW and annual production of 5114 TWh (Terevatore), from which:

- 91 contracts BOT type, for the construction of 251 Small HPP-s;
- 3 Contracts of BOT type, for the construction of 6 Big HPP-s;
- 8 concessionary contracts of ROT type, for the rehabilitation of 31 existing HPP;
- 3 contracts of BOO type for the construction of 5 HPP-s

**From the above mentioned contracts concessionary contracts are signed for the construction of big hydro power plants**

1. "Ashta" hydropower plant on Drin river is given by concession to the Austrian Company "Osterreichische Elektrizitatseirtschafts-Aktiengesellschaft";



2. The cascade of the HPPs on Devoll river is given by concession to “EVN AG”, concessionary Company;
3. On Vjosa River it is under construction process Kalivaci HPP-s, given by concession to “Kalivac Green Energy” Company;

#### **Actually, 5 Small Hydropower Plants are put in operation**

- “Tërvoli” HPP, in Gramshi district, which exploits the waters of Holta river, with an installed power of 12000 kW;
- “Bishnica 2” HPP, that exploits the water of Bishnica torrent, in Pogradec district, with an installed power of 2500 kW
- “Cernaleva” HPP, that exploits the water of Borje torrent, in Kukes District, that actually is put in operation with a capacity of 400 kW and after that it is predicted to work with an installed capacity of 2950 kW.
- “Lubonja” HPP in Korça District, with a capacity of 300 kW
- “Dishnica” HPP in Korça District with a capacity of 160 kW.

## **5. Free areas for investments**

#### **Free possible areas for investments in hydro- energetic field are:**

- On Drin River (Skavica HPP construction, with an installed capacity of 350 MW)
- On Osum River (based on the French Company studies “Sogreah” four HPPs with a total capacity of 94 MW can be constructed).
- On Vjosa River (based on the French Company studies “Sogreah” a capacity of 428 MW can be generated).
- On Erzen River.