AGJENCIA KOMBETARE E BURIMEVE NATYRORE
NATIONAL AGENCY OF NATURAL RESOURCES

Hydro- Energetic

Potential of Albania

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Albania **Overview**

Geography and Climate

Map 1. Map of Albania

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.

The total area of the Republic of Albania is 28,748 km^2 of which 4.7% are water (equal to 1,352 km^2)
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 North Macedonia and 282 km south and southeast with Greece. The coastline of the country is 362 km long.

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

The total area of the Republic of Albania is 28,748 km^2

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.

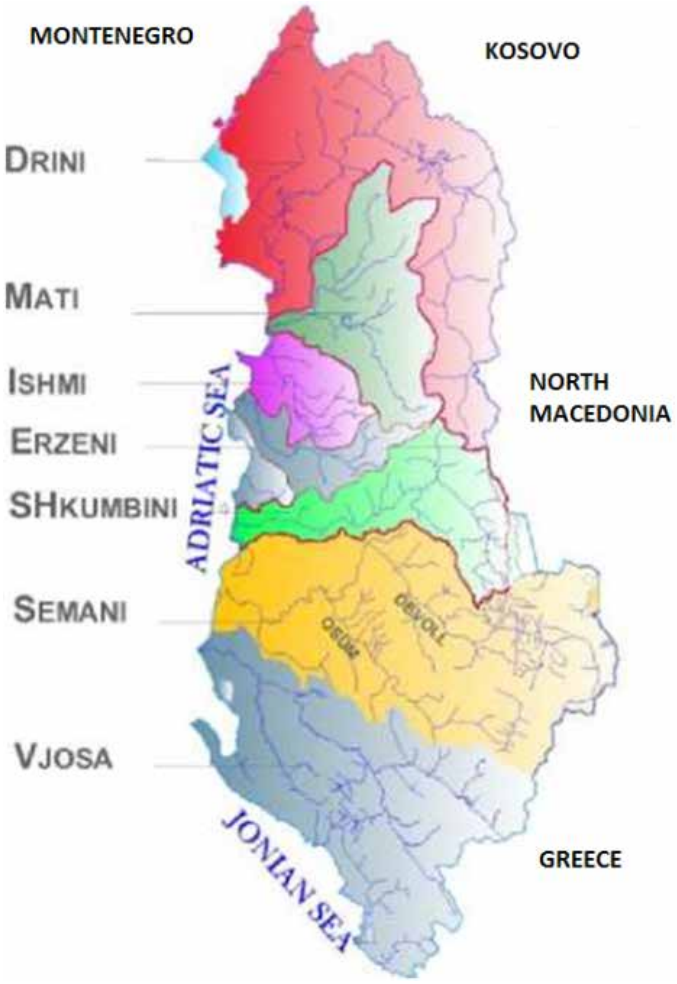
Situated along the Adriatic and Ionian Sea coast, Albania constitutes one of the key points of intersection for the roads crossing the Western Mediterranean into the Balkans and Minor Asia. Albania ensures via sea routes the connection with other world countries and that of the central regions of the Balkans Peninsula with the Adriatic coast. The Adriatic Sea and Otranto Strait stand in-between Albania and Italy.

Demography and Economy

Albania is a Parliamentary Republic. Since **1920** Tirana is the capital city of Albania, with an estimate population of **1.000.000** inhabitants. Tirana is also the major administrative and commercial center of the country. The official language is Albanian. The population is **2,876,591**million inhabitants (INSTAT/ January 2017). Albania is estimated to be a country with a relatively young population. GDP: US$ **15.635** billion the nominal estimation in total and US$ **5.448** the nominal estimation per capita(IMF), Inflation rate: **1.7%**, (INSTAT), Unemployment rate: **12.3%** (INSTAT).Lek (ALL) is the official currency.

Hydro- Energetic **Sources In Albania**

Hydro- power potential



Map 2. Albanian hydrographical territory

Albania has a big hydro-energetic potential and only 35.4% of it is being used so far. The country has a total installed capacity of 1466 MW and marks an average hydropower production of 5283 GW/h. The total hydro-energetic reserves enable the installation of 4500MW power network and its annual electric power production could reach up to 16TWh. There are 253 concessionary contracts in process with a total capacity of 1,998 MW

Albanian hydrographical territory is 44, 000 km^2 or 57% larger than its geographical territory, taking under consideration the catchment area of the rivers.
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^3/sec.
Due to the morphological features, Albania is quite rich in rivers, with more than 152 rivers and streams

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^3/sec, Vjosa with 210 m^3/sec, Seman with 101 m^3/sec, Mat with 74 m^3/sec, Shkumbin with 60 m^3/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 considered 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^2)	Average flow (m^3/s)	Module of flow ($l/S/km^2$)	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

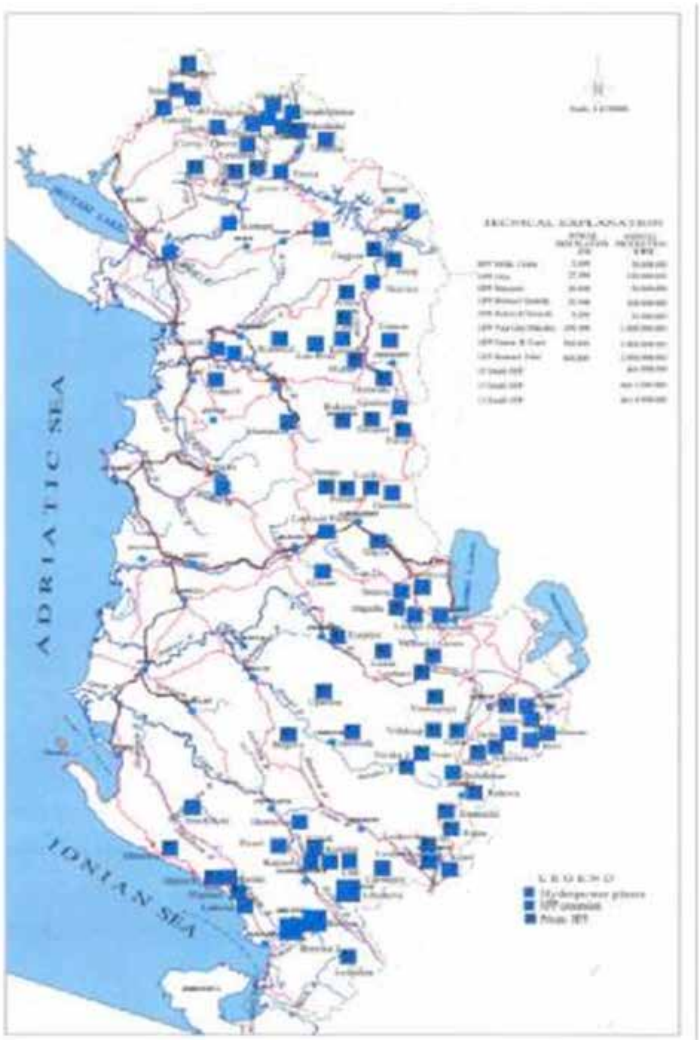
Energy Development in Albania

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 the King Zog period, Albania followed its track as an agrarian country, without any signs of energy development. During the period1945 – 1951, the power production was amounted to an average of 10 KWh per capita.

The hydropower sector began to develop after 1952, when Selita Hydropower Plant started operating, with an installed capacity of 5,000 KW. In 1958, the Ulza Hydropower Plant started operating with an installed capacity of 25,000 KW. Following the construction of three other hydropower plants Shkopet, Bistrica I and Bistrica II, as well as the Thermal Power Plant in Fier, the power production reached 500 KWh per capital.

In 1971, 1978 and 1985, three of the biggest hydropower plants of the country: Vau i Dejes 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 respectively constructed. Also, 90 other small hydropower plants were constructed during this period.

No further development in the energy sector was done from 1985 up to 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 top priorities, focusing on the development of renewable energy resources in particular hydroelectric power.



Map 3. Map of 7 big hydropower plants and 38 smaller ones currently in operation.

Big Hydropower

Plants

On the Drin River, there are three operational hydropowerplantswith a total installed capacity of 1350 MW, "Vau i Dejes" HPP, "Fierza" HPP and "Koman" HPP. A concessionary contract has been concluded for "Ashta" hydropower plant on the Drin River between the Ministry of Economy, Trade and Energy and Austrian Company "Osterreichische elektrizitatseirtschafts- Aktiengesellschaft", with an installed capacity of 48.2 MW and it is currently operational.
On the Mat River there are two operational hydropower plants, "Uleza" HPP and "Shkopet" HPP, with an installed capacity of 49 MW.

Existing Hydropower plants

On the Devoll River before the year 1990 commenced the construction work for "Banja" hydropower plant with a designated capacityof 60 MW. However, only40% of the construction was completed and then the process was suspended. In 2009 a concessionary contract was signed for the construction of a cascade of HPP's on the Devoll River between METE and the Austrian Company EVN AG, where 3 (three) HPPs, were planned to be constructed "Lozhan-Grabove""Skenderbegas- Qekin" and "Banja" with a total installed capacity of 319 MW. "Banja" HPP was builtand is currently under operation.

On the Vjosa River, "Kalivaç" hydropower plant is under construction, with an installed capacity up to 100 MW.

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

Nr.	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.	Bistrica I HPP (Saranda)	22.500	100.000.000
4.	VauDejes 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
	Total	**1.421.500**	**5.114.000.000**

Table 2.Large scale Hydro Power Plants constructed in Albania.

Small Hydropower Plants

Albania counts70 small existing hydropower plants with a capacity ranged 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 for the energy supply of the remote mountain areas. They were supposed to be derivational hydropower plants and make use of the water that flows close to those areas.

Actual situation

As the Concessionary Law was approved, in 2006, and the relevant structures were established, a special focus was set on the water resource exploitation for energy production. The majority part of Albanian water cascades were granted as unsolicited concession under the respective offers.
During 2007-2011 approximately 230 unsolicited project-proposals were presented to METE mainly by national private investors. Another law was approved, in 2015as well as the "CMD 822; Date 07.10.2015" on the concession of HPP-s under 2MW of power

Since 2002 up to date, 253 concessionary contracts are signed with a total capacity of 1,998 MW and annual generation of 7,930TW/h (Terawatt/h), from which:

- **181 contract are of BOT type**
- **72 contracts are of BOT type, for HPP-s of power under 2 MW**

Two concessionary contracts signed for large hydropower plants that are operational;

1. **"Ashta" hydropower plant on the Drin river is given by concession to the Austrian Company "Osterreichische Elektrizitatseirtschafts-Aktiengesellschaft";**
2. **The cascade of the HPPs on the Devoll river given by concession to "EVN AG", concessionary Company;**

Smaller Hydropower Plants that are currently operating in Albania:

- "Tervoli" HPP, in Gramshi District, which exploits the waters of Holta river, with an installed power of 10000 kW;
- "Bishnica 2" HPP, that exploits the water of Bishnicastream, in Pogradec District, with an installed power of 2500 kW
- "Lubonja" HPP in Korca District, with a capacity of 300 kW
- "Dishnica" HPP in Korca District with a capacity of 160 kW
- "Prell"HPP in Dibra Distrcit with a capacity of 10700 kW
- "Stranik" HPP in Elbasan District with a capacity of 4200 kWetc.

There are currently 69 small Hydropower Plants operating in Albania

Nr	HPP	Installed Capacity (kW)	Annual Generation capacity (kWh)
1	Lenie, Corovode,	600	3430000
2	Tucep	400	2200000
3	Stranik, Zall Torre	4200	31500000
4	Sasaj	5500	23000000
5	Bogove	2500	5200000
6	Gjanc	3700	6800000
7	Xhyre	250	4560000

8	Smokthina	9600	40000000
9	22 HPPs	14400	57730000
10	Tervol	10000	40000000
11	Verbe-Selcë	2800	16000000
12	Çarshove	1200	6300000
13	Lapaj	12600	52400000
14	Lengarica	6200	35700000
15	Peshku	1900	11580000
16	Sllabinje	9300	50000000
17	Stravaj	3626	16317000
18	Vlushe	14200	65000000
19	Selishte	1350	8400000
20	Rapuni 1, 2	4250	44654000
21	Strelca 1, 2, 3	8300	14700000
22	Prelle 1, 2	10700	48900000
23	Bishnica 1, 2	2950	12910000
24	Ashta 1, 2	48200	165000000
25	Klos	1519	5130000
26	Gur Shpat 1,2	1670	7180000
27	Murdhari 1,2	3680	14761970
28	Radove	2000	11600000
29	Lubonje	300	1300000
30	Picar 1	200	1200000
31	Dishnice	160	800000
32	Borje , Oreshke , Cernaleve 1, Cernaleve	12200	55680000
33	Bele 1,2; Topojan 1,2; Orgjost i Ri	24260	108537038
34	Shemri; Mgull	1200	4867077
35	Kryezi, Kryezi i Eperm	800	3431782
36	3 HPP-s .Trebisht stream :	1775	8040720
37	Shtika 1, 2, 3, 4	1300	4281366
38	Langarica 3, Gostivisht, Ura e Dashit	3940	16668473
39	Faqekuq 1, 2	5400	18566000
40	Fterre, Fterre 1	3000	4281366
41	The stream Zalli i Licones, Koka 1	2500	12410000
42	Nishova 1, 2	1110	6584215
43	Sotire 1, 2	2100	8578428
44	The Cascade of HPPs on Dadha River	4010	21690000
45	Qafezeze	1450	5350000
46	Pobreg	9000	40450000
47	Lena 1, 2, 2A	4485	22969000
48	Vertop	1200	4650000

49	Devoll: Moglice, Kokelit , Banje	319000	468000000, 321500000, 195700000
50	Shutine	1400	6174587
51	ShkalleCerruje 1,2; Rrupe; Klos	12750	41728000000
52	Kozel, Helmes 1, 2	1580	7270000
53	Germani 1, 2	4350	109914763
54	FusheArres; Peshqesh ; Ura e Fanit; Fangu	109710	347246000
55	Bisak	750	3520000
56	Ostreni i vogel	320	1849527
57	Cekreze 1,2	550	2667137
58	Koxheraj	600	2487603
59	Ujanik 2	1900	9579419
60	Truen	2300	9340000
61	Llenga HPPs 1, 2, 3	3530	15835751
62	Treska 3: HPPs 1, 2, 3, 4	4620	21060705
63	Malla	2370	10098790
64	Shpella Poshte II ,	2318	11853000
65	Ballenje	1000	4197824
66	Dobrenje	800	3254000
67	Perrollaj	500	1518780
68	Qarr	1000	3192352
69	Zalli Okshtunit Cascade	33280	155007480

Table 3. List of HPP currently operating in Albania

Potential investments' area

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

- On the Drin River (Skavica HPP is under construction, with an installed capacity of 350 MW).
- The Kalivaç Hydropower Plant will use waters of the Vjosa River with an installed capacity of N = 111 MW and average annual generation of E = 366.62 GWh / year. "Kalivaç" Hydropower Plant will be constructed by the Concession Company "Ayen - ALB" Joint Stock Company. It is located about 15 km from Memaliaj town.
- The "Poçem" hydro power plant will use down stream waters of Vjosa River, near the Poçem village. This hydropower plant will have a dam with a large reservoir. The anticipated dam is located at a distance of 500 m from the existing Poçemi bridge. It will have an installed capacity of N = 102 MW and an average annual generation of E = 366.8 GWh / year.

In 2019 pursuant to the order of the Minister of Infrastructure and Energy "No. 48 date 30.01.2019 On verifying the implementation of the conditions of the concession contracts subject to the CMD No.822 dated 07.10.2015,on Hydro Power Sources "all concessionary contracts will be verified if contract terms are met or not. After this a process other possible investment areas will be made available.

Current Legal **Framework onHPP**

The responsible Ministry for energy acts as the contracting authority for all concessions granted in hydropower sector. HPP concessions are granted in accordance with Law No.13/2013 "On Concessions and Public – Private

- Partnership"(this law was aligned with the EU directive 2004/18/EC) as amended by the Law No. 88/2014 and Law No.77/2015. According to the Law on "Concessions and PPP"; the Private – Public - Partnership establishes a long term cooperation, regulated by contract between the contracting authority (public partner) and one or more economic operators (private partner), where the private partner undertakes the obligation to provide public services within the competencies of the public partner and/or the obligation to provide to the public partner the necessary prerequisites for providing public services. These prerequisites include the construction or renovation of public infrastructure and/or its operation and maintenance.

Legislation and regulations for concessions define the principles and procedures for the evaluation and granting the concession opportunities in hydropower sector. According to the concession law and regulation, all concessions in Albania are approved by the Council of Ministers.

HPP concessions in Albania are organized as BOT or ROT. According to this regulation, the operator finances the construction / reconstruction of the power plant and the benefits from the operation of the plant. The sale of power generated by the Operator is guaranteed through the Power Purchase Agreement signed between the Operator and Wholes public Suppliers with tariffs regulated by ERE using the "feed in" model. According to the concession law and regulation, all concessions in Albania are granted for a period not longer than 35 years

- The Council of Ministers' Decision no.822 dated 07.10.2015, "On approval of the rules and procedures for the construction of new electric energy generation capacities, that are not subject to concession contracts ",

Glossary

AKBN	National Agency on Natural Resources (NANR English acronym)
BOO	Build-Operate- Own
BOT	Build-Operate-Transfer
CMD	Council of Ministers' Decision
ERE	Regulating Entity of Energy
INSTAT	Institute of Statistics
METE	Ministry of Economy, Trade and Energy previous name of responsible Ministry on energy
MEI	Ministry of Energy and Industry, previous name of responsible Ministry on energy
MIE	Ministry of Infrastructure and Energy actual name of responsible Ministry on energy
PPA	Power Purchase Agreement
PPP	Public Private Partnership
ROT	Reconstruct-Operate-Transfer

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