



Renewable Energy





OVERVIEW

Albania has a considerable potential of Renewable Energy Sources (RES). RES represents an important energy source available in Albania. The use of such sources for energy production represents a long-term objective for implementation of three objectives of energy policies of the country, such as: support for the overall economic development; increase of the security of energy supply and protection of environment. Renewable energy might be the solution for the decrease of this strategic dependence on the imports and the improvement not only of the security for energy supply but even of the macroeconomic and political security of the country decreasing the domestic budget deficit.

Albanian energy goals consist in some priorities;

- security of supply through better exploitation;
- utilization of energy sources;
- energy diversification;
- increasing the competitiveness and,
- the environmental protection.

The main instruments of Albanian energy policies include the harmonization of legal framework of the energy sector with European directives, consumer protection, energy efficiency promotion and increasing the utilization of renewable sources. Energy planning based on least cost and the right actions to encourage private and private-public investments (private investments in particular).

Albania has signed and ratified the Kyoto Protocol by Law no. 9334, date 16.12.2004, (as a country of Non Annex I list). This year, it is under the process of legal framework harmonization in energy efficiency and the promotion of renewable energies resources.

Albania has committed to a binding 38% target of energy from renewable sources in gross final energy consumption in 2020, starting with 31,2% in 2009. In 2015, according to the energy balance published by EUROSTAT, Albania achieved a 34,9% share of energy from renewable sources, above the third indicative trajectory of 34,3%.

In February 2017, a new Law on Promotion of the Use of Energy from Renewable Sources that partially transposes Directive 2009/28/EC was adopted. The Law introduces the granting of support to renewable energy producers through a tendering procedure based on contracts for difference on top of the market price of electricity. It also incorporates an auction scheme for renewable capacities greater than 2MW and a net metering scheme for photovoltaic (PV) panels on rooftops with a capacity of up to 500 kW.

RES Policy

Albanian government has considered the promotion of renewable energy use as an important tool of energy policies for the increase of the security for energy supply, economic development, energy sector sustainability and environment protection. Even though, in Albania, more than 95% of energy and 20-23% of primary total resources have been provided by hydropower stations, the objectives of Albanian Government energy policy intend to increase furthermore the use of RES.

The share of RES in the overall energy of Albania is largely determined by hydropower and firewood. Albanian government has been focused on the diversification of its supply with energy and the promotion of other renewable energy resources, such as biomass, solar energy and wind energy. As the feed-in tariff scheme we will expect that the share of energy from renewable sources will grow towards the target set for 2020 (38%).

National Renewable Energy Action Plan

Based on the Article 5 of the Law No 7/2017 of 2.02.2017 "On promotion of the use of energy from renewable sources", it is foreseen the revision of the National Renewable Energy Action Plan (DCM No. 179, date 28.3.2018). A thorough consideration will be given to the expected expansion of hydro power plants, their environmental impact etc. In the current NREAP, the installed energy expansion targets up to 2020 are as follows:

- 750 MW of hydropower energy;
- 50 MW of photovoltaic energy;
- 30 MW of wind energy.

The revision of the NREAP in the first quarter of 2018 will take into consideration the progress in the deployment of these technologies towards these targets, and adjust them accordingly to ensure that the 38% renewable target will be achieved.

Support Schemes

To ensure compliance with the Guidelines on State Aid for Environmental Protection and Energy 2014 - 2020, the new Law on Promotion of the Use of Energy from Renewable Sources introduced a support scheme based on contracts for difference, which are equivalent to a sliding feed-in premium system. The total support available will be determined by auctions for producers above 2 MW of installed capacity. The renewable energy producers will sell the electricity in the market and receive the variable premium as the difference between the auction price and the electricity market price. Implementing rules for the net metering scheme for PV-panels on rooftops with a capacity of up to 500 kW introduced by the new Law were being drafted at the time of publication of this document.

The support is granted through a Feed in Tariff after a concessionary agreement has been reached.

- 1.** The PPA for HPP changes every year and is based on the Hungarian CAPEX Market price +15% premium for 15 years. Also get energy purchased first.
- 2.** The price for 2017 is 100 Euro/MWh for Solar and 76 Euro/MWh for Wind, subject to change every year based on technology and country economic factors.

Access to and Operation of the Grids

The Law on Power Sector provides for priority and guaranteed access of renewables to the network and priority dispatch of electricity from renewable sources. However, secondary legislation is incomplete. In practical terms, transmission and distribution system operators have to improve the methodology determining the costs of connection to the grid or grid reinforcements and transparency towards investors. Standard balance responsibility is required for all renewable energy producers larger than 2 MW.

Relevant applicable legislation in the energy sector

1. Law Nr. 7/2017 “On the Promotion of Renewable Energy Resources
2. Law Nr. 43/2015 “On the Sector of Electric Energy”
3. Law no. 9876, dated 14.02.2008 amended “On production, transport and trade of biofuels and other renewable fuels for transport”, as amended, sets out the legal framework for granting permits for the production, wholesale and retail of bio-fuels and other renewable fuels, for the purpose of transport.

Law Nr. 7/2017 “On the Promotion of Renewable Energy Resources” Target of 38% Renewables until 2020.
 Law no. 43/2015, dated 30.04.2015 “On power sector” sets out the main principles for the energy sector development, including RES power plants and the transmission and distribution networks. Law transposes the EU Directive 2009/72 on electricity and repealing the previous law on electricity (Law no. 40/2015, dated 22.05.2003). This law also includes the requirements and criteria for granting a license to carry out an activity in energy sector.

The law also includes a number of specific provisions regulating the construction of a direct line or of a commercial interconnection line.

The Albanian Government and ERE are reviewing by-laws, with the aim of meeting the requirements of the new law on energy sector, including a number of by-laws provided below.

- Decision of Council Of Ministers No. 179/2018 “On the National Renewable Energy Action Plan”
- Decision of Council of Ministers No. 822, date 7.10.2015, “On approving the rules and procedures for the construction of new capacities of electricity generation, that aren’t subject to concession”.
- Decision of Council of Ministers No. 369, date 26.4.2017, “On approving the methodology for determining the purchase price of electricity produced from small renewable sources of sun and wind”.
- Decision of Council of Ministers No. 349, date 12.6.2018, “On adopting of support measures to promote the use of electricity from renewable sources of sun and wind”
- Decision of Council of Ministers no. 416, dated 13.05.2015 “On approval of the general and special conditions, accompanying documents, term of validity, application forms for authorization and permit, procedures for the revision of decision-making process and forms of authorization of permit for the use of water resources”, which defines the specific conditions and procedures for reviewing and decision-making to grant an authorization or permit of use of water resources, including the use of water for construction of hydropowerplants.
- Decision of ERE no. 120, dated 27.07.2017 “on the determination of prices of electricity produced by small plant PV with installed capacities up to 2 MW and by wind with capacity installed to 3 MW”

Renewable Energy Potential

Thanks to the favorable geographic position in the Mediterranean Sea Basin, Albania has significant potential of renewable resources to be utilized as energy sources as, water, wind, sun, and biomass and geothermal.

Hydro potential

The power system in our country currently is almost based on hydropower. Albania has a considerable hydro-power potential, where only 35% of it is utilized. The hydrographic territory of Albania has a surface of 44,000 km² or 57% more than the national area of our country. The total reserves are estimated at 4,500 MW and the annual output potential can reach 18 TWh.



Fig. 1: View of HPP in Albania

In January 2018 results that from the contracting authority MEI were signed a total of 194 contracts for the construction of 540 small HPPs nationwide, where representing 31% of the generation forecast, which is only 43% of the electricity consumption projected in 2020. Expectation of HPVs in the construction phase can increase about 8% hydro production in 2020. The total net output for 2017 by private generators/concession was 1,608,181 MWh or about 35.5% of the total domestic production being 4,525,173 MWh. (ERE)

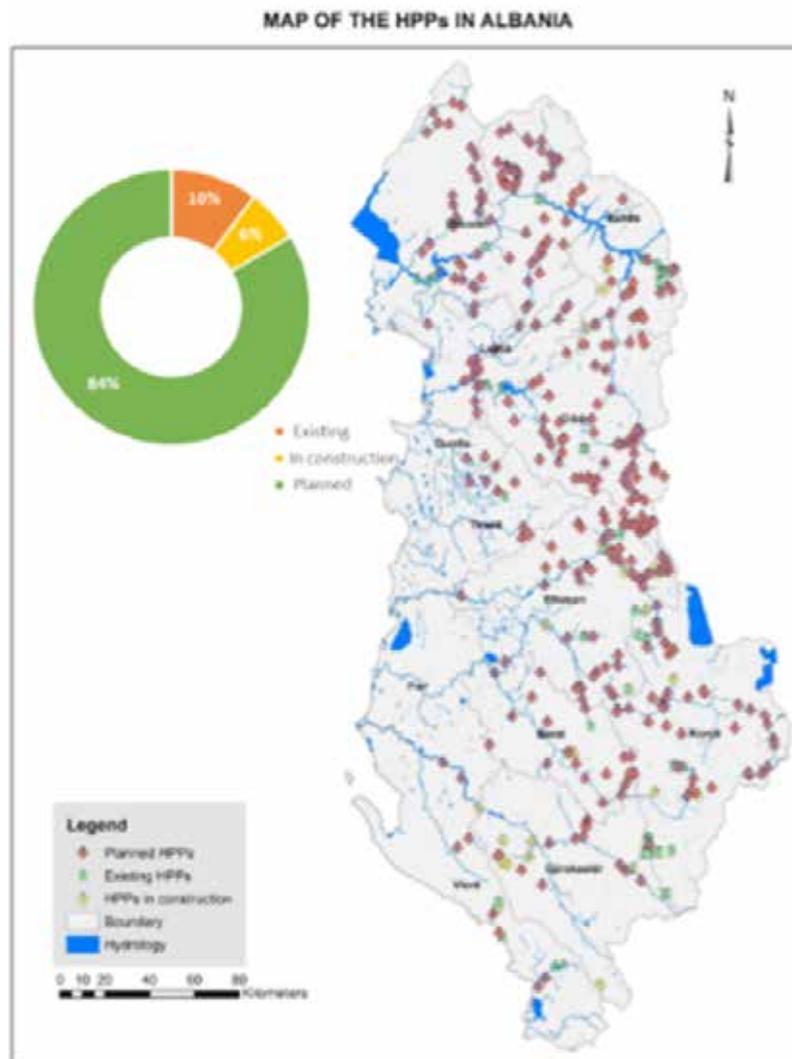


Fig. 2: Distribution of existing HPP in Albania



Fig. : Photo SHPP in Albania Wind potential

The wind energy constitutes a potential opportunity for power production in Albania. The major problem of establishing wind powerplant in Albania is the lack of consecutive measurements of the velocity and duration of the wind. Consequently, various companies ready to invest in this field should make aprior assessment of the records of the wind velocity and duration.



Fig. 3: View of Wind Turbine

There are many attractive areas identified in Albania, such as Shkodra (Velipoja, Has), Kukës, Lezha (Ishull-Shëngjin, Tale, Balldre), Durrës (Ishëm, P. Romano), Kavaja (Kryevidh), Fier (Seman), Karavasta (Hoxhara 1, Hoxhara 2), Vlore (Akerni), Saranda, Korça and Tepelena.

The main directions of wind in our country are northwest-southeast and southwest-northeast, with dominant direction towards land. Our country's coastline is 345 km north-south direction, where a part is the coast allows lands and the other coast very close to the south seaside mountain. Inside the territory, the direction and intensity of wind from area to area varies in time.

Thus, in this division are areas where can be determined periods of time for which wind speed can be used as energy source. There have been recorded very high wind speeds in Kryevidhit stations, Gllaves, Xarrës, Sheqerasit and Durrës.

Installations up to 3MW of wind get a Feed in Tariff. The price of support has been established by the Ministry through the calculation of the LCOE and approved by the Regulatory entity Decision No. 120, dated 27.07.2017. Figure 1 shows regional wind speed, it is worth to mention that the highest velocities of wind are registered especially during the winter period, when cyclone activity prevails.



Figure 4. Regional wind speed average (m/s)



Figure 5. Average hours wind speed (m/s)

Currently, we are licensed by ERE 8 Companies that will build wind power plants.

Nr	SUBJEKTI	Central Eolik	Kapacitet
			[MW]
1	"Hera" shpk	Projekti Kappet	150
2	"Alb Wind Energy" shpk	Grykderdhja e Shkumbinit Terpan	225
3	"Ers 08" shpk	Kavaje Kryevidh 1	40
4	"Biopower Green Energy" shpk	Lezhe BPGE 1 & BPGE 2	230
5	"E Vento srl Albania" shpk	Sarandë Butrint, Markat	72
6	"Albanian Green Energy" shpk	Lezhe	140

Solar energy

Our country is considered to have a good regime of solar energy and a high potential of solar radiation. Solar energy is a very promising energy source for the future and its use is potential, because energy is an infinite natural resource, is the biggest natural reserve of great power that is distributed all over the world in greater amounts than our needs for energy, is clean and its use requires no other costs, and it poses no environmental pollution risk.

In the territory of our country we have a considerable potential of solar energy, where many of its areas are exposed to a radiation that reaches from 1185 kWh/m² per year up to 1700kWh/m² per year. On clear weather, every square meter of the horizontal surface of this area may absorb around 2200 kWh per year.

The average annual value of intensity radiation is the main indicator that provides economic efficiency of the Solar Water Heating Panels (SWHP). About 80% of such installations are situated in the western part (Adriatic and Jonian coast).



Fig. 6: Solar panel in building

From an economic point of view, the SWHP installations in the regions of Shkodra, Shëngjin, Durrës, Kavajë, Fier, Vlora and Saranda is more efficient in comparison to other regions of Albania.

Map 1 shows average quantity of sunshine in the territory of Albania (5 zones) and Map 2 shows the average daily solar radiation in the territory of Albania (10 zones).

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Fig.7: Average quantity of sunshine in the territory of Albania

Figura 2: Regjimi i rrezatimit diellor (kWh/m2/vit)

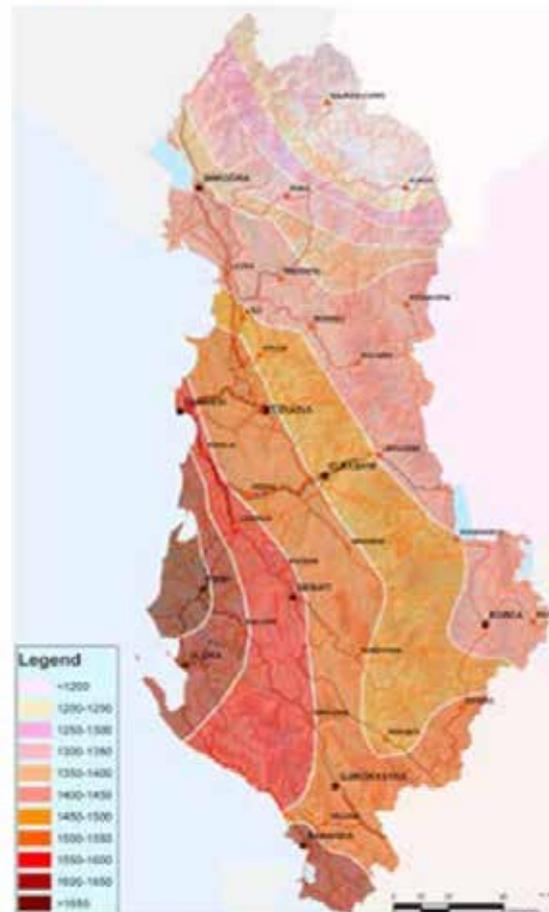


Fig.8: Average daily solar radiation in the territory of Albania

Companies licensed by ERE for power generation from photovoltaic plants

Nr.	SUBJEKTI	Central Fotovoltaik	Kapacitet
			{MW}
1	"RTS" SH.P.K	Tren - Bilisht, Korçë	2
2	"Age Sunpower" sh.p.k	Topoje (Sheq Marinas)	1.998
3	"Seman Sunpower" Sh.p.k	Topoje (Sheq Marinas)	2
4	"Malësia Solar 1" Sh.p.k	Lahë e Poshtme, Shkrel, Koplik, Rrethi Malësi e Madhe	2.5
5	"Malësia Solar 2" Sh.p.k	Lahë e Poshtme, Shkrel, Koplik, Rrethi Malësi e Madhe	2.5
6	"Malësia Solar 3" Sh.p.k	Lahë e Poshtme, Shkrel, Koplik, Rrethi Malësi e Madhe	2.5
7	"Aed Solar" Sh.p.k	Topoje	1.998
8	"Sonne" Sh.p.k	Topojë (Sheq Marinas)	1.998
9	"OSOJA ENERGY" SH.P.K,	Seman - 1, Sheq-Marinas	2
10	"Seman - 2 Sun" Sh.p.k	Seman - 2, Sheq-Marinas	2

The first photovoltaic plant in Albania is located in Korçë (UKKO) with 1MWp capacity. Actually, 2019 in Albania Territory are installing and 10 PV plants.





Fig 9. Photovoltaic plant in Albania

Support Schemes awarded through Auctions

Installations up to 2MW of Solar get a Feed in Tariff. The price of support has been established by the Ministry through the calculation of the LCOE and approved by the Regulatory entity Decision No. 120, dated 27.07.2017.

- The price for 2017 is 100Euro/MWh for Solar and is subject to change every year based on technology and country economic factors.

The Developer owns the land. There are the very high interest form developers. Several solar plants are under construction.

For the First Time the Government has developed the Auction scheme for solar capacity of 50MW of installed power.

The government offers:

- The land;
- The connecting point to the grid;
- The PPA for 15 Years;
- The developers with the best project and lowest asking price for MWh is awarded as a winner;
- After the creation of the Liberalized Market the support will be through a Contract for Difference.

The Net Metering Scheme (Net Billing) is still in draft form as extensive consultations with all the institutions involved are being carried.

The Scheme will have the following basic principles:

- A yearly Netting (0 Surplus Energy at the end of the year);
- The Ministry and Regulatory Entity will approve a price of purchase for the electricity injected to the grid;
- At the start it will probably be the same as the retail price in order to have a fast uptake and deployment.
- The maximum allowed installed capacity is 500 kW.
- The Distribution System Operator has expressed concerns for the technical implications of balancing the grid.



Geothermal energy

Geothermal energy resources in Albania are estimated as warm water sources of the undergrounds oil, which have a sufficient temperature to be used as energy source. Geothermic situation offers two ways to use energy geothermic, separated as follows:

- thermal sources with low enthalpy and maximum temperature up to 80°C. These are natural resources or wells that are located in a vast territory of Albania, from the south, near to the border with Greece north-eastern area;
- deep vertical wells for geothermal energy, where is included a large number of oil and abandoned gas wells, that can be used for heating purposes.

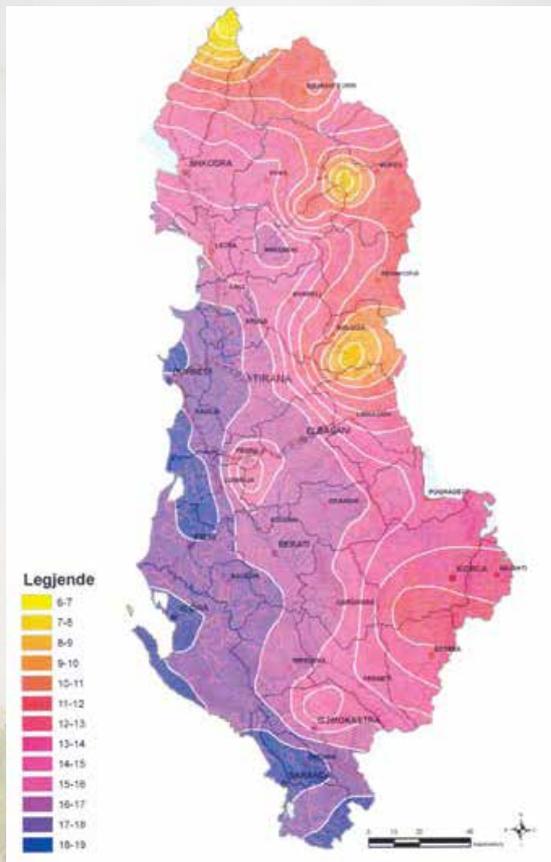


Fig. 10: Territorial distribution of geothermal heat

In our country there are some more appropriate areas for its use like the three geothermic space: Ardenices geothermic Space that is concentrated in the coastal region, where water has a temperature of 32-38 °C, and flow 15-18 l/sec. Geothermic space of Kruja where are located the biggest geothermic sources in Albania evaluated $5.9 \times 10^8 - 5.1 \times 10^9$ GJ and the geothermic space of Peshkopi in the northeast of Albania, where some sources of thermal near each other have a water temperature of 43.5 °C and inflows of 14-17 l/s.

Biomass

Biomass potential in our country can be grouped in five main categories:

- trees and wood wastes from various processes in the wood operation industry;
- plant remains (stalk, seeds, etc..), at the end of their production cycle, that are not used in other branches of economy;
- energetic vegetables (trees) that are planted to be burned as biomass after having reached their maturity;
- animal wastes (waste, bones, skin) which are not used in other economy branches.
- Urban Waste

Energetic assessment of biomass that comes from timber is done considering the possibility of turning them into fire wood, sawdust and pieces of wood chips, straw and other pressed stubble, pressed sawdust briquettes and also the forests exploitation in maintenance scale to have asustainable growth.

Forests have played an important role in the development of the economy and society in Albania. At present, they cover an area of 1,052,253 hectares, equal to 36% of the total area of the country (INSTAT, 2017). Albanian Forest Cadaster is the main information system which contains quantitative data about forest area and stocking volume. The current stocking volume according to forest cadaster is 55.2 Million cubic meter (INSTAT, 2017). The stocking volume felled during the 1990-2017 period, shows variability among years having a decreasing trend. The decrease of the harvested volume after 90 is a complex problem which is related to many reasons. Lack of the state financial funds to invest in opening of new forest roads and limited interventions in many forest parcels in remote areas have affected the forest area and volume obtained by final cutting operations. Meanwhile, many private timber processing companies invested a lot of money in manufacturing and this increased the demand for round wood. Firewood, round wood and wood for construction has been the most demanded commodities by the market. Firewood is an important wood fuel and the main source for heating especially in rural areas and in some public institutions such as schools, kindergarten etc. Currently our country uses 168 ktoe energy from the firewood (AKBN, Energy Balance 2017).



Urban Solid Waste Potential

The solid waste potential as combustible fuels, is ensured by its composition, calorific power, humidity and in combustible mass. According to the latest data released by INSTAT, about 2.2 million tons were produced in 2016 in Albania, of which 1,072,236, Solid Waste Municipalities (MNB), accounting for about 17% or 221,000 tons per year of non-urban waste (industrial or perhaps inert).

Projections of urban solid waste potentials in some of the biggest cities of Albania such as Tirana, Durrës etc. Solid wastes can be used for power generation and thermal energy.

The Albanian Government has planned to build 3 incinerators, one in Elbasan with a capacity of 150 tons / day (which is built), one in Fier with a capacity of 240 tons / day and one in Tirana with a capacity of 920 tons per day. By grouping all three projected incinerators, the total processing capacity of these plants is estimated at about 1,310 tons per day or 478,150 tons / year. This amount accounts for about 45% of the total municipal solid waste generated across the country.





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