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Energetic Resources of Kosovo as a Strategic Potential for its Economical Development

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Abstract: It is known the fact that Republic of Kosovo no matter it has a small area of territory, in its territory are concentrated the grandiose energetic recourses, of Balkan and European collocation. In this project, the basic characteristics of energetic resources will be generally presented starting from coal, hydro-thermal recourses, hydro-recourses, and also the possibility of oil and gas recourses, (according to some earlier unofficial data it is said that the interesting structures have been developed for bedding of oil and gas in Dukagjini basin, it is remained to be explored.). No matter in the developed world, the different energetic sources, as are: Oil, Gas, radioactive Energy, geothermal energy, hydro- energy, every day is more used for insurance of energetic needs in Kosovo, coal is further remaining as a main basic assured source of energetic needs, because of the colossal reserves of around 13 billion tones and the convenient conditions for their exploitation. Parallel the coal in the future it must be studied also the possibility of the greater exploitation of hydro recourses and geothermal field, which generated a great thermal flux and which in the ecological aspect present a small problems in environment.

***Keywords**: Energetic resources, coal, hydro-thermal recourses, Dukagjini pond, economical development*

Introduction

By yearlong detailed and half detailed systematic geological, geophysical, hydro-geological researches, it is determined that the greatest concentrations of coal reserves are in our three known ponds:

-Kosovo coal pond,
-Dukagjini coal pond,
-Drenica coal pond.

The scale of study for these ponds is different, while the greatest importance is dedicated to the Kosovo coal pond, and exactly it is dedicated to the most productive special parts of the Kosovo coal field, and in this case the reserves are verified just for those parts of the deposits planned for exploitation.

Kosovo coal pond

Kosovo coal pond makes part in collocation of the biggest coal ponds of Kosovo and also of the Balkan and Europe. From the general surface of the Kosovo field, around 1.400 km², by the so far explorations it is outlined the extent of coal series in a surface from around 240 km². A coal-bed contained by medium thickness of 45m is developed in this pond. The geological age of coal series is the Early Pontian Pl_1. This pond is characterised by a high scale of study, and according to some calculations until now around 2.600 structural, geo-mechanical, hydro-geological drillings with the linear length of 250.000 m are done. Coal is of lignite type with qualitative characteristics that differs in the horizontal and vertical direction. The average proportion of coal – wasteland for this pond is 1: 1.85. The depth of the occurrence of coal moves from the surface outcrop to max 310 m below the field level.

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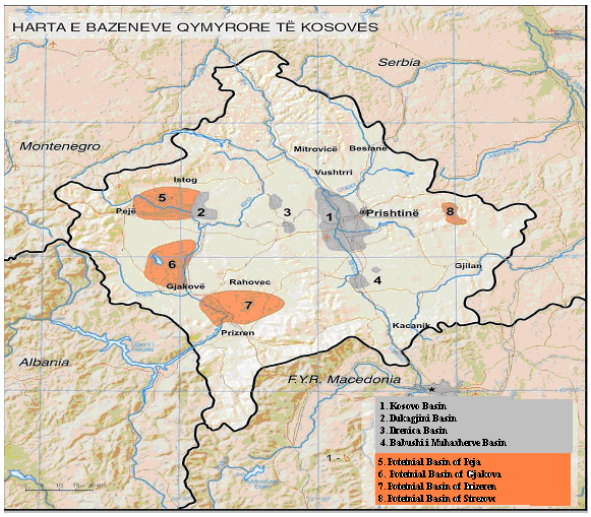

Figure 1. Map of Kosovo Coal Basins

The average values of the main parameters of quality for this pond are:
ETU = 7.300 kJ/kg, S<1%, L = 45 - 47 %, H = 18%.

Explanation:
ETU – lower calorific value, S – Sulphur, L – moisture, H – ash
Until now, some calculations of coal potentiality are done for this pond, which have different values from 6.5 – 10 billion ton, whereas we will present the calculation of the reserves for 2006. According to the studies of the Institute "Inkos" Obiliq, these reserves are determined:

Balance reserves:	9,050,501,288 t
Outbalance reserves:	1,319,223,481 t
Geological reserves	10,369,724,770 t

Two active surface excavations are in this pond from which the coal is extracted for thermo-energetic facilities with an annual capacity around 7 000.000 t per year. In preparation, the activities for the definition of coal field of North Kosovo (Sibovc) are being developed which will ensure the coal for the XXI century for the thermo-energy facilities of Kosovo.

200 million ton coal has been exploited until now, which present around 2% of total reserves of Kosovo pond. In the south parts of Kosovo pond is determined the extent of coal series also in Babushin e Muhaxherve with the surface of 0,5km^2 and geological reserves of 3,7 million ton with average thickness of 9m.
The average values of the main parameters of quality for this coal pond are:
ETU=7.350 kJ/kg, S<1%, L = 40-47, H = 22%
In this coal field, explorations have not been finished and real probabilities exist for the growth of reserves in other parts of field. The mine of Babush was active here but it doesn't function now.

Dukagjini coal pond

Three coal series are developed in Dukagjini pond:
- Miopliocene, (before pontinian) series,
- Early pliocene, (pontinian) series,
- Late pliocene, (levantinian) series.

The series of early Pliocene (Pontinian) in the economic aspect is the most important because within it the coal-bed is developed with considerable thickness, which it was the object of yearlong geological explorations. The most productive part of Dukagjini pond lies in the north part of the pond in localities Kline-Tuçep. In this field is determined the coal-bed consisted with the average thickness around 40m whereas exploitable around 30m.
The thickness of clay substrata is considerable and varies in the border 0,1- 3,00m. This field is covered with a net of around 450 explorative drillings, and these reserves have been determined:

Geological reserves of coal according categories are:

Category	Quantity (t)
A	10,438,070
B	189,626,800
C_1	685,630,100
C_2	1,634,824,312
Total	2,520,510,282

The average values of the main basic parameters of quality are:

ETU = 6,00->10.000 kJ/kg, L = 31, 69%, H = 20,27%, S = 1,06 %

The geological exploration have not been finished in this pond, hereupon with additional researches it shall be continued, in order of increase of the scale of study and discovery of new coal fields, and which according to some of our predictions, reserves will be increased for around 2 milliard tons, that presents a great energetic potential for the increase of energetic capacity also in this region (Figure1; number 5, 6, 7, 8).

As perspective regions for further explorations remain:

- Region of Peja, (5)
- Region of Gjakova, (6)
- Region of Prizren. (7)

Drenica coal pond

Drenica coal pond lies between Kosovo pond, in East and Dukagjini pond, in West. With regard to coal, in Drenica pond are distinguished two coal fields: Skenderaj and Drenas, with the lowest apparent potential comparing with those of above-mentioned ponds (map number 3). In the field of Skenderaj, with the so far geological explorations, it is determined a coal-bed with around 15m average thickness, with a surface of 5.1 km², and these reserves have been determined:

Stripping ratio overburden/ coal = 1.35 : 1 m^3/t

- Reserves of category B:		10 876 546 t
- Reserves of category C_1:		48 850 608 t
Total ($B+C_1$):		59 724 154 t
- Reserves of category C_2:	around	10 000 000 t
Total ($B+C_1+C_2$):	around	69 724 154 t

Characteristics of the quality of coal are:

ETU~7300 kJ/kg, L=32.46 H=25.60%, S=1.58%

In the field of Drenas it is outlined a deposit in the area of 3.2 km², and with the reserves of category C_1: around 21 million ton (Figure 1, number 3). The total reserves in the Drenas pond are: around 90 million ton. Except the above-mentioned fields, also in the field of Strezovc have been determined the presence of coal with 0.5-5m thickness, but with the obvious lowest coal potential.

Resources of gas and oil

According to some unofficial data, from the different geophysical studies done before, Dukagjini pond (Peje –Mitrovice zone) presents a perspective zone with bedding of interesting structures of gas and oil. It remains that with complex geophysical – geological researches to be given full answer concerning the fact that in this region are developed interesting economical structure for beddings of gas and oil.

Geo-thermal resources

Recently, the explorations of thermo-energetic potential of earth are pretty intensive, and except this, also the possibility and the manner of use of these energetic accumulations is colossal. In Kosovo exists natural conditions for the use of geo-thermal sources within different geo-tectonic units, these

regions generate great geo-thermal flux from inside the earth, and in this case, these geo-thermal conditions shall be distinguished from economic aspect:

- Field of Kllokot,
- Field of Banjskë,
- Field of Banja e Pejës,

It remains that in the future, by complex studies, to be illuminated the geo-thermal potentiality of Kosovo and the above-mentioned zones, and also the possibility of their rational exploitation.

Radioactive resources

Kosovo with the so far explorations is not studied enough concerning the radioactive resources, taking into consideration the geological constructions from the metallogenic aspect of radioactive elements. In East and Southeast parts of Kosovo, 15 km, in South of Gjilan, by radiometric methods it is determined a Uranium vein carrier in trachyte rocks, with 1,4 m thickness and with average contents of Uranium (U) of 0,0263% and tracks of thorium.

There are many magmatic formations in Kosovo, which in the world they are carriers of economic concentrations of uranium, so that exist real probabilities of occurrences and deposits of radioactive elements.

Water resources (hydro-resources)

Kosovo has hydrographic net developed very well, especially in Dukagjini pond.According to some before calculations of the Institute "J.Çerni" in Belgrade, from river flows and underground water of alluviums, Kosovo can ensure around 131x10 ^{6} m³ water in a year. Technical usage of hydro-potentials is small and it has value around 630 MWh, from which in usage are: Hydro-power plant Gazivodë (Leposaviq): 36.6 MWh, Hydro-power plant Kozhnjar: 37.6 MWh. In perspective are: Hydro-power plant Zhuri, with 377 MWh, Hydro-power plant Drelje: with 137 MWh. 42 MWh are planned to be used in some mini- hydro-power plants in different localities of Kosovo (Fig.4). If the strategy for energetic development of Kosovo is done, from the usage of Hydro-resources is foreseen that the Republic of Kosovo would have in disposition around 630 MW/h electrical energy.

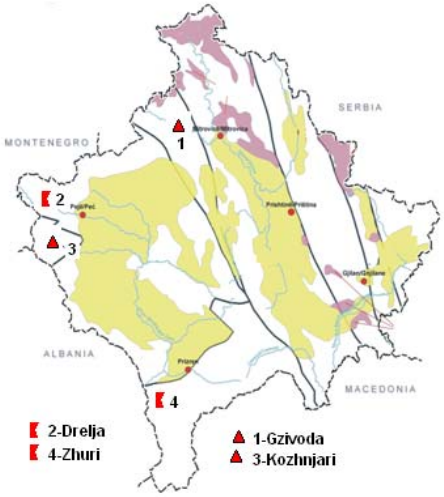

Figure 4 Observation map of water resources (hydro-resources)

Conclusion

From what it is presented above, we can determine that Kosovo has energetic resources which many times exceed its needs. Coal with its grandiose reserves, with around 13 billion ton, concentrated in the two greatest ponds of Kosovo; doubtless it presents the main mineral thermo-energetic raw material. Except coal, the priority in the future shall be given to hydro-potentials and geothermal resources, that they must not be so inconsiderable.

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