

The possibility of investing in medium-sized dams, electric power generation Case Study dams Aphamea complex in the province of Hama *

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Abstract

The hydropower is considered the most mature among renewable energy resources used to generate electricity. The boom in these stations, even the small ones, has attracted the investors in the field of energy and penetrated in the electricity industry in the developed markets of the world.

Hydroelectric power stations used to cover the variable part of the daily load curve due to its high potential in maneuverability and efficiency characteristic. Based on the data provided only 20 – 30% of this range covered by hydroelectric stations in Syria, which is basically the three Euphrates plants (Al Furat, Tishreen, Al Baath) and the remaining part covered by thermal power plants, while the peaks reduce the operation and efficiency conditions and increase the cost of the energy production.

From here comes the importance and the necessity of thinking about increasing the share of hydropower to meet the daily peaks of load curve. The solutions on the table now on the local and global level is a trend towards hydroelectric stations and pump-storage plants, where the large hydroelectric power stations have exhausted the major flows energy in the country.

The dams of Aphamea, which are designed for the goals of irrigation, were chosen as a study case, based on the method of pumping to fill up the lakes, where the re-emptying the lakes happens across the lower excreta of these dams in reverse way without the benefit of its potential energy. But the goal to take advantage of these energies, it has been proposed to establish three hydropower stations buildings adjacent to the pumping stations which are previously studied in this complex. Being a preliminary study, the main objective of this study is to calculate the hydropower that could be invested in this system without going deeply in the design calculations for the station buildings. In the context of this work, it shows that the energy can be invested from these dams are up to 18.47 million kW.h per year, and this energy considered as a wasted energy and to compensate this energy by using gas or thermal stations, we need fuel worth what is equivalent of 1.88 million dollars per year.

At the end of this work, the focus was on the analytical simulation of the technical and economic feasibility for the construction and use of small hydropower stations in our project in order to highlight the importance of the subject and the extent of the rentier expected to capital invested in this area.

Key terms: Small hydropower plants, Hydropower, Thermal power stations, Pumped-Storage.

* For the paper in Arabic see pages (117-127).

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