

alternatives 3 and 7 have a value close of assured energy to the alternatives with the best results. They differ in type and size, but the Kaplan turbine has the highest proportional project.

For all these aspects discussed about the records of streamflow, the methodology for capacity sizing of a SHP through the concept of assured energy and the perspective of two turbines operating in parallel of different types and sizes is relevant due to the relation between evaluating the power generation and the lower forced unavailability rate. All this analysis can be executed already in the initial phases of a hydroelectric project of the SHP.

4. Conclusion

The Brazilian hydrography is responsible for 60% of electric energy production. As a result, the energy matrix of the country depends on the hydraulic system and in periods of drought needs to resort to other sources to meet the demand for energy consumption.

For increase the relevance and potential of SHP in the Brazilian electrical system is necessary that the operation of the plants achieve high levels of reliability during all the days of the year, especially in drought periods. Also, to maximize the energy production at the plant installation site. Thus, the SHP projects need to have good efficiency and reliability.

The proposed methodology and the results presented in this research demonstrates that, in the initial phase of SHP projects, it is feasible and important to evaluate the hydroelectric potential of new plants, highlighting and paying attention to the results of possible alternatives.

The methodology is also presented as a good model under energy and efficiency point of view, since the capacity size of SHP is directly related to the historical record of the plant deployment site. The value of the installed power using the assured energy allows the plant to produce energy according to the variations of the river flow, without the risk of incurring in a plant under or oversizing.

However, the technical evaluation of the alternatives associated with the economic issues of the project, such as investment and sales of energy, would allow a greater weighting on the project aspects during the implementation phase. Therefore, it considers as recommendation for future research the combination of economic and technical evaluation.

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