

Analyzing Hydropower Energy

<https://marketpublishers.com/r/A48E4FE776CEN.html>

Date: February 2012

Pages: 120

Price: US\$ 375.00 (Single User License)

ID: A48E4FE776CEN

Abstracts

The role of water as a multi-faceted necessity for humans cannot be more stressed upon since as many adaptive uses that were demanded of it by civilizations; water has met most of them or in some cases - all. Nature's most wonderful resource never ceases to amaze imaginations as it proves to be a resource with the capacity to generate power in many forms whether be it hydropower or steam power to produce electricity to power communities and their needs.

The historical nature of water as a resource to civilizations can be gauged by the early uses of Hydropower which was used for irrigation, milling of grain, textile manufacture, and the operation of sawmills. Imperial Rome was one of the first nations to pioneer the organized usage of exploiting energy from moving water wherein water powered mills produced flour from grain, and in China and the rest of the Far East, hydraulically operated "pot wheel" pumps raised water into irrigation canals.

The canal building era peaked in the 1830s with hydropower being applied to transport barge traffic up and down steep hills. Direct mechanical power usage warranted industries to be located close to waterfalls as in the growth phase of Minneapolis.

Present day hydropower usage is focused on electric power generation thereby offering low cost energy transmitted over large distances as a solution to the ever pertinent low cost energy need.

Hydroelectricity is now supplying about 19 % of the world's usage. More effort is being invested to construct bigger dams but the same are facing human relocation resistance in developing countries or ecological concerns the developed ones. There are other concerns like the correct investment focus path of the private investors in the hydropower industry.

Hydropower essentially does not produce carbon dioxide or other harmful gaseous residues as in the case of fossil fuel, and therefore, hydropower proves to be a net offset of CO₂ rather than generator.

The overall cost of hydropower proves to be far less than the cost of power from conventional sources like fossil fuels or nuclear energy. Areas of hydropower abundance have proven to attract the fastest investment initiatives, which have contributed to their development.

This report from Aruvian's R'search – Analyzing Hydropower Energy - explains the earliest usage of hydropower as benefiting civilizations from historical perspective and the present scenario of the hydropower market. The report explains the various types and sizes of hydropower plants wherein the research and development efforts are focused on increasing generation and at the same time maintaining a balance on ecological concerns. The classifications of hydropower turbines and the basic thermodynamics by which hydroelectricity is generated and at the same time ensuring that efficiency is maintained is also included in the report..

The role of hydropower in fuelling growth worldwide which needs a regulatory framework focused for hydropower and the financing needs of this sector are explained in the report. An in-depth analysis of the Small Hydropower Sector is also undertaken.

Aruvian's report tabulates the stances taken by the public, private and joint financing initiatives - which to some extent also determine the overall forward vector movement for any hydropower project. The report takes a non-partisan view on the imbalances in the project financing decisions which are leading to relicensing being considered as a serious option for sustained development in synchronization with the ecological balance.

The report establishes the key link between hydropower and precipitation. FERC's role in relicensing and ensuring that compliance on ecological issues as in the Tacoma decision is described in the report in conjunction with the protection for endangered species objectives.

The report also examines the areas of risk and human safety parameters which should be exercised around hydropower plants in order that they are present the right perception of hydropower being clean safe and a user friendly energy resource of the future.

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