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IN PAKISTAN**

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## **HYDROELECTRIC POWER IN PAKISTAN**

### **KEY NOTE ADDRESS**

**By**  
**Dr. Izhar-ul-Haq**

Nature has bestowed Pakistan with substantial Hydro Power Potential estimated to be 32,000 MW. Out of this 3000 MW of Power has been developed while another 6000 MW is in various active stages of development. This leaves a huge potential yet to be exploited.

There is no doubt that hydel power is the cheapest and cleanest source of renewable energy. Usually the hydel power stations are multidimensional resources. The intrinsic worth of hydel scheme is not a simple arithmetic. It is generally a water reserve, a flood control barrier, a boost to agriculture in the command area, fish cultural and of course a renewable source of energy with very little operation and maintenance costs.

At the time of independence in 1947, Pakistan had only one hydropower plant at Jabban (Malakand) with an installed capacity of 9.6 MW. Rasul Hydel of 22 MW was the first to be commissioned in 1952 followed by Jabban Hydel extension of 10MW, Dargai Hydel of 20 MW Chichoki 14 MW, Nadipur 14 MW and Shadiwal 14MW. The first major thrust in developing Hydel Power in 1956-60 was the construction of Warsak Dam 160 MW with the Canadian assistance.

1959 when WAPDA took over the management of West Pakistan Electricity Deptt. the total hydel and thermal generating capacity was about 119 MW. With the construction of large dams; Mangla Dam 800 MW and Tarbela Dam 1750 MW, the total hydel power capacity increased to 2900 MW and the four provinces of Pakistan were connected by a national grid system. Two units of 200 MW were added at Warsak in 1981, two additional units of 200 MW at Mangla and 4 new units of 432 MW each are under progress at Tarbela.

The economic growth and the energy supply are inextricably linked to each other. With the increase in load presently there is shortage of 700 MW as compared to the total Hydel and Thermal installed capacity of 6624 MW. The requirement by the turn of the century is estimated to be 14000 MW. To achieve this goal we must exploit all the proven and feasible hydel power. In default a large number of thermal power stations shall have to installed to match the power generation with the load. Pakistan does not have enough reserves of fossil fuels and they shall have to be imported. With the rising prices this would be a huge drain on the national exchequer and also increase the unit cost of electricity and all the products.

A global view of the power generation additions would reveal that the countries and regions which still have unexploited hydel power potential, are concentrating on such resources to the maximu. For instance, in Latin America, Inter American Development Bank's (IDB)'s over-whelming emphasis over the next decade will be on hydro electric power. In fact, in the past, the bank's lending for hydro-power generation has been 96.9 pc of the total lending for generation. This policy of the bank in favour of hydel development speaks for itself. The countries

which had substantially exhausted their big hydel resources have turned towards small hydro to utilize as much of this renewable source of power as may be humanly feasible.

WAPDA has already carried out feasibility and design studies for hydel power projects such as : Kalabagh Dam is on the anvil, Basha Dam feasibility study is ready. Ranking study for the major hydroelectric power projects indicates that after Kalabagh and Basha, Dasu, Pattan and Thakot are the hydel power station feasible as compared to the thermal power stations. As large hydel power stations require longer gestation periods and huge investments, a strategy to develop medium size hydel power stations has been developed. Consequently feasibility studies for low head hydel stations such as at Jinnah barrage, Chashma barrage, Taunsa barrage, Guddu barrage and at a number of link canals have been carried out. In addition schemes have been prepared for mini hydel power stations in the far flung northern areas of Pakistan.

The symposium on hydro power offers the following topics for consideration:

1. Hydro-Power potential of Pakistan  
by Dr. Izhar-ul-Haq & Engr. K.F.Sheikh.
2. Hydro Electric Power Projects Construction, Planning and Implementation in inaccessible northern areas of Pakistan  
By Engr. Brig. Ijaz-ud-Din Khan
3. Socio-Economic Imperatives of Hydro Electric Development in Pakistan  
By Engr. Mian Fazal Ahmad
4. Micro Power Plant Programme in Pakistan  
By Engr. Anwar A. Junejo & Engr. Zafar Iqbal.
5. Planning Strategy for Development of Hydro Power in Pakistan  
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7. Construction Planning Of Small Hydro Power Projects Financing-contract Packaging Project Schedule  
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8. Indigenous Development to Exploit Hydel Potential In Pakistan.  
By Prof. Dr. M.Y. Akhtar.
9. Kundal Shahi Hydel Scheme  
By Engr. Khalid Yamin

Bssed on the submission of the authors and delibration in the symposium, recommendations would be prepared for the consideration of the Government of Pakistan.