

HYDRO POWER POTENTIAL AND INVESTMENT PROSPECTS IN GILGIT-BALTISTAN

PRESENTATION SEQUENCE

- **Map of Gilgit–Baltistan**
- **Salient Potential Indicators for Hydro Development in GB**
- **Supply & Demand of Electricity in Gilgit–Baltistan**
- **Hydro Power Potential**
- **Institutional Arrangement**
- **Present Power Policies**
- **Salient Reforms Underway**
- **Incentives already available for Private Investors**
- **Challenges**
- **Possible Ventures for Private Investment**

Salient Potential Indicators for Hydro Development in Gilgit-Baltistan

- ❖ Gilgit Baltistan is the water bank for Pakistan due to large area of glaciers and snow deposits in its mountains.
- ❖ Catchment Area is 72496 Sq Km, which include about 27 % glaciers, the biggest in the world outside polar region.
- ❖ Main Tributaries of Indus River are 06 (Olding River, Shyoke River, Shigar River, Gilgit River, Hunza River & Astore River).
- ❖ Drop of Indus River up to Diamar /Basha Dam site is 1.37 Km.
- ❖ Average annual run off near Basha is 50 MAF.
- ❖ Hydro power potential on Main Tributaries & Indus River is 40,000 MW.
- ❖ Hydro power potential on sub tributaries is 1,200 MW.

SUPPLY AND DEMAND OF ELECTRICITY IN GILGIT-BALTISTAN

- ▶ Present Generation : 90 MW (92 Power Stations)
- ▶ Population Connected with suppressed load : 75%
- ▶ Present Demand : Conservative - 200 MW
Optimistic - 410 MW
- ▶ Future Demand Forecast:-
 - ▶ 2011 : 428 MW
 - ▶ 2012 : 446 MW
 - ▶ 2013 : 465 MW
 - ▶ 2014 : 485 MW
 - ▶ 2015 : 506 MW

- ▶ 2016 : 528 MW
- ▶ 2017 : 551 MW
- ▶ 2030 : 863 MW

- ▶ Under Construction Power

Projects : 29 (40 MW)

- ▶ Projects Under Active Planning :-

S. #	Name	Capacity	Status
1	Hanzal Gilgit River	20 MW	Feasibility Study completed
2	Shagharthang, Skardu (Financed by ADB)	26 MW	Procurement stage

S. #	Name	Capacity	Status
3	Thak Chilas (Financed by ADB)	4 MW	Procurement stage
4	Naltar V, Gilgit (PSDP)	14 MW	Procurement stage
5	Naltar III, Gilgit (PSDP)	16 MW	Procurement stage
6	Basho, Skardu	28 MW	Detail Engineering Design under process by WAPDA
7	Harpo, Skardu	42 MW	Detail Engineering Design under process by WAPDA

S. #	Name	Capacity	Status
10	Ghowari, Shyoke Ghanche	20 MW	Feasibility study completed
11	Hassanabad, Hunza	5 MW	Feasibility study completed
12	Dermadar, Ghizer	2 MW	Feasibility study completed
13	Hushey, Ghanche	4 MW	PC-II under process
14	Regional Grid in Gilgit-Baltistan	132 KV	Feasibility Study completed

▶ Average Construction Cost

Per MW in GB : 2.0 Million US \$

▶ Average Production Cost

Per Unit (KWh) : 3 – 4 US cents

HYDRO POWER POTENTIAL IDENTIFIED

1) 122 sites on sub tributaries
in GB identified by WAPDA
and GTZ (Germany)

772 MW

2) 6 sites identified by WAPDA on River Indus:

a. Yugo 520 MW

b. Skardu 1600 MW

c. Tungus 2200 MW

d. Yulbo 2800 MW

e. Bunji 7100 MW

f. Diamer-Basha 4500 MW

TOTAL 18,720 MW

3) 36 projects identified by
W & P department GB on
tributaries and sub tributaries
of River Indus

204 MW

Total

19,696 MW

INSTITUTIONAL ARRANGEMENTS

- ▶ Water & Power Department GB is responsible for Planning, Execution and Operation of power projects in GB.
- ▶ WAPDA is responsible for mega projects on River Indus besides small hydros under specific directions of GOP.
- ▶ NEPRA's jurisdiction not yet extended to GB in the absence of National Grid. W & P department is responsible for devising tariff with the approval of GB government.
- ▶ GB Electricity Development Company being raised shortly.

PRESENT POWER POLICIES

- ▶ **GOP Policy for power generation projects 2002:** All types of power projects exceeding 50 MW capacity under public sector, private sector (IPPs) and public private partnership are covered. BOOT and BOO are applicable.
- ▶ **GOP Renewable Energy Policy 2006:** Solar, Wind and Small Hydro Power projects up to 50 MW capacity are covered. The policy also provides private investment incentives.
- ▶ **GB Hydel and Renewable Energy Policy 2007:** This policy covers projects up to 50 MW capacity under public sector program. Being revised for development of hydro power projects by private sector and public private partnership also.

SALIENT REFORMS UNDERWAY

- Consultancy services acquired for “Establishment of GB Electricity Development Company” to facilitate investors through one window operation besides capacity building of W&P Department.
- Feasibility study of Regional Grid in GB completed. The project aims at interconnection of all existing and future hydro power projects to a common grid for improvement of diversity factor, minimize line losses and establish a power corridor for interconnection to the National Grid. Estimated cost of the project is Rs. 25 billion and proposed for construction in 3 phases.

- Computerized billing system introduced in Gilgit city as pilot project.
- PC Energy Meters introduced to minimize electricity pilferage.

INCENTIVES ALREADY AVAILABLE FOR PRIVATE SECTOR INVESTORS

Under “Renewable Energy Policy of Pakistan 2006”, which is applicable in Gilgit Baltistan also following incentives for private sector investment in development of Hydro Power projects having capacity of 50 MW or below are covered:–

1. Investment opportunity for private sector for following categories:–
 - a. IPPs for sale of power to the grid only. (Solicited and unsolicited proposals)

- b. Captive Power cum grid spillover projects for self-use and sale to utility.
 - c. Captive power projects for self or dedicated use.
 - d. Isolated grid power projects of 5 MW and below.
2. Except for category 1(a) above, the projects will not require any LOI, LOS or IA.
 3. It permits an investor to generate electricity from hydro power project at one location and receive an equivalent amount of energy for own use elsewhere on the grid at investors own cost of generation plus transmission charges (wheeling concept / Energy Banking).

4. It permits “Net Metering and Billing”. A power producer can sell surplus energy at one time and receive electricity from the grid at another time and settle accounts on net basis.
5. Simplified principles of tariff determination.
6. Insulates the investor from hydrological variability risk.
7. It facilitates projects to obtain carbon credits for avoided green-house gas emissions, helping financial returns and reducing energy cost for the purchaser and inturn the consumers.
8. Off grid hydro power projects can be developed for supply to a local community by corporate entities, NGOs or individuals at any location with the approval of the Provincial Government. For such projects, simplified procedural

arrangements can be developed by the provincial government.

9. No Custom Duty or Sales Tax for machinery and equipments with spares requiring import and not manufactured in the country for initial installation for renewable energy projects.
10. Many other fiscal and financial incentives. Details can be seen from the Renewable Energy Policy 2006.

CHALLENGES

- Less revenue receipt due to lower load factor for repayment to the IPPs.
- Affordable energy cost for the consumers in case of power purchased from IPPs.
- GOP may not permit any subsidy under present policy.
- Non interconnection of GB with the national grid.
- NEPRA's role in GB.
- Capacity building of the power utility.
- Tendency of high electricity pilferage.

POSSIBLE VENTURES FOR PRIVATE INVESTMENT

1. Establishment of regional grid in Gilgit–Baltistan to interlink all the power potential sites.
2. Investment in the field of Captive Power & Energy Banking. Industry and hydro power development may take place simultaneously.
3. The main purpose to club hydro power development with other industries would enable the private investors to offer affordable tariff.

4. Power Projects through IPPs would be viable for mega projects on Indus river through PPIB/WAPDA. Commencement of physical work on high voltage transmission line by WAPDA for interconnection to the national grid may take place simultaneously

5. Project through IPPs can be developed simultaneously at the identified sites near to Bunji and Diamar/Basha projects to supply power to WAPDA during implementation of these vital projects.

THANK YOU

The End