PAPER NO. 201

POWER GROWTH IN PAKISTAN

BY

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The per Capita consumption of Electricity is now internationally considered as an indicator of the level of SOCIO-ECONOMIC development of a country. Energy whether gas, oil or Electricity is the basic input for any sustainable Economic activity at the National level. The highly developed countries of the world have the highest per Capita consumption of energy also. The least developed countries show the low level of per Capita energy consumption. Thus there is a direct relationship between the per Capita consumption of Energy and SOCIO-ECONOMIC standard achieved by any Nation.

Power sector Development in Pakistan is the most talked about area of Economic interest these days. In the recent past we in Pakistan have experienced long duration of Power load shedding, and forced outages due to supply and demand gap. These Power shortages have not only effected the general population, but have hit hard the fragile industrial sector. As per study's carried out it is assessed that the GNP suffers a loss of Rs 15 for every KWH un-supplied.

Pakistan is gifted with vast natural Resources like fertile land, sweet Water ,oil and Gas reserves. A huge quantity of Coal has been found at Ther in Sindh but it will take about ten years to develop the mechanized Coal mining industry for commercial production. Therefore a major portion of the budget has to be allocated for the import of oil required for power generation.

The growth of Electricity has been phenomenal during the last 25 years yet the gap between supply and demand had widened, and in 1995, load shedding up to 2000 MW at peak hours was experienced.

Just to refresh your memory, let us glance through the following statistics:

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ITEM	1960	1995	INCREASE (TIMES)
	WAPDA / KESC	WAPDA / KESC	WAPDA / KESC
Installed capacity (MW)	366 / 56	10,903 / 1875	30 / 33
No. of customers (Millions)	0.31 / 0.098	9.1 / 1.30	29 / 13
Units Gen. (Million) kWH	781 / 311	46,189 /, 8760	59 / 28

The above increase over the years although significant, yet at international standard we rank as one of the world poorest country regarding per capita consumption of electricity :

COUNTRY	KWH/ CAPITA / ANNUM
USA	11,753
KOREA	2,994
MALAYSIA	1,695
CHINA	651
PHILPPINES	431
PAKISTAN	404
INDIA	337
BANGLA DESH	83

POWER DEMAND FORECAST

The power demand in WAPDA system during the past 5 years i.e. (1990-91 to 1994-95) has increased at an average annual growth rate of about 8 percent. The maximum demand was 8,252 MW in 1994-95. For future years up to 9th five years plan the demand is given below:

YEAR	DEMAND (MW)
1993-94	8,067
1994-95	8,252
1995-96	9,248
1996-97	9,910
1997-98	10,601
1998-99	11,493
1999-2000	12,438
2000-2001	13,444
2001-2002	14,523
2002-2003	15,623

Power generation is a capital intensive activity and in its present from it is not possible for the Public sector alone to implement Power Generation expansion plan to country's need and eliminate load shedding. Therefore

there was no alternative except to invite private sector in the Development of Generation, Transmission and Distribution of Power.

Government of Pakistan therefore, took notice of this extremely serious situation, and constituted a task force for Energy to suggest measures and prepare incentive package for attracting private sector investment in the Power sector. Based on the recommendations of this Task Force, new Energy policy was announced in March ,1994 giving very liberal incentives to the investors.

Government of Pakistan then announced the Hydel Power Generation, and Transmission line polices. Salient features of each policy will be explained separately.

CORPORATIZATION / PRIVATIZATION OF WAPDA / KESC

In addition to the above, corporatization / privatization of WAPDA & KESC units will commence under a phased programme. Kot Addu combined cycle power complex will be the first to be privatized. Amongst the Area Electricity Boards, Faisalabad, will be the first to be commercialized.

ESTABLISHMENT OF NEPRA

The Government of Pakistan has accorded approval for the establishment of an independent National Electric Power Regulatory Authority (NEPRA) to act as watchdog the interests of consumers from exploitation through higher tariffs not commensurate with capacity to pay. Electric power entities will be answerable to NEPRA of all the matters of technical, financial, economic and commercial related to generation, transmission and distribution of power.

1. Policy Framework and Package of Incentives for Private Sector Power Generation Projects March 1994

The installed capacity in the country was 10,800 MW when the above policy was declared in March 1994. This capacity was insufficient to meet the demand, the year round. The magnitude of shortage was 2,000 MW, which has to be bridged by load shedding even with suppressed demand.

The annual average 8% increase in the demand requires addition of 900 MW generation capacity annually to cope with the rising demand to start with. At the above growth rate the annual addition

in the year 2,000 will be 1,300 MW, increasing to 5,000 MW in the year 2018. In the above perspective, resource mobilization in private sector was the only option to meet the target as public sector was not able to substantiate this huge development programme.

Salient Features of Generation Policy

1. The investors are free in the choice of technology involved, site selection and fuel to be used.
2. The Government of Pakistan has offered Bulk power tariff of US Cents 6.5/KWH, to be paid in Pak rupees for first ten years. A levelized tariff of US Cents 5.9 / KWH over the life of the project has been included as final parameter for acceptance of the tariff.

3. A premium of US Cents 0.25 / KWH based on the energy sold to WAPDA /KESC during the first 10 years of project operation, will also be allowed to projects above 100 MW which are commissioned by the end of 1997.

4. The actual payment of the tariff will comprise two components i.e. (i) Capacity charges (ii) Energy charges. 60 % capacity charges has been assured by the Government of Pakistan while energy charges will be paid on actual energy sold to WAPDA / KESC over 60 % plant factor.

   Under the above policy frame work, 16 Nos. PPAs have so far been signed for 3,912 MW installed capacity as per Annex-A.

   This energy policy is totally silent about transfer of technology in the country.

2. **Policy Framework And Package of Incentive for Private Sector Hydel Power Generation Projects May 1995**

   The policy will cover all feasible Hydropower plants having capacity up to 300 MW either of run of the river type or with nominal pondage for adsorption of daily flow fluctuation on streams and tributaries, Plants located on the main Indus, Jhelum, Chenab and River rivers and plants requiring

reservoirs for seasonal pondage on all rivers are to be excluded from private sector.

Hydropower plants of capacities above 300 MW which do not disturb downstream users water rights and do not undermine the optimum development potential of a site would be considered on case to case basis irrespective of the location.

Tariff for Bulk Purchase of Power

The power shall be purchased by WAPDA under a long term contract (25 years).The ownership will be transferred to the Government free of charge thereafter, for its further lease.

Hydropower Plants up to 20 MW

a) A bulk power tariff of US Cents 6.1 / KWH to be paid in Pak rupees as an average for the first ten years.

b) A levelized tariff of US Cents 5.57 / KWH for first 25 years has been calculated as final parameters for acceptance of tariff.

Hydropower Plants from 21 MW to 300 MW

a) A bulk power tariff US Cents 6.0 / KWH to be paid in Pak rupees as an average for first 10 years.

b) A levelizes tariff of US Cents 4.7 / KWH for first 25 years of the project as final parameter.

Plant Factor

Following two conditions must be fulfilled by the investors:

i) Installed capacity of the Power House will ensure 50% minimum annual plant factor.

ii) A minimum of 40% of annual energy is required to be produced during low water months of January to June.

Payment of Bulk Power

i) The bulk purchase tariff is an indicative tariff which has been calculated on an annual plant factor of 50%

ii) The payment will be made on the basis of actual energy sold to WAPDA during a month or in case of non despatch by WAPDA for 95% of energy that could have been generated by the Hydropower Plant based on average historic Hydrology for that month .

iii) WAPDA will deduct the price for the use of Water at the rate of US Cents 0.233/KWH from all payments made to the investor for the purchase of energy. This amount will then be paid in equivalent rupees to the Province in which the power plant is located.

POLICY FRAMEWORK AND PACKAGE OF INCENTIVES FOR PRIVATE SECTOR TRANSMISSION LINE PROJECTS

The large scale capacity additions in the electrical generation as elucidated above will require corresponding augmentation in the transmission network. Hence in March 1995 Government of Pakistan published a policy framework package on transmission sector.

This project will be offered on BOM (Build, own and maintain) basis comprising Over Head Transmission Lines and Grid Stations of 220 KV and above.

The sponsor will be paid service charges covering capital and maintenance cost including return on equity. The tariff on per KM per month basis for the transmission line has been calculated by dividing the country into three zones.

Similarly the service charges for associated sub-station bays / equipment have been calculated per unit / per month basis.

IMPACT OF POWER POLICES ON SOCIAL AND PRODUCTION SECTOR

The formation of energy tariff in Pakistan is based on its cheap Hydel and costly thermal generation mix. It is ironical however that

in the last decade or so the component of hydel generation has decreased adversely effecting the tariff.

INSTALLED CAPACITY IN MW

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	June 1995
Hydel	2,547	2,897	2,897	2,897	2,897	2,897	2,897	2,897	3,329	3,761	4,725	4,825
Thermal	1,407	1,442	2,025	2,452	2,652	3,052	3,512	4,156	4,164	4,391	4,956	5,978
Total	3,954	4,339	4,949	5,349	5,549	5,949	6,409	7,053	7,493	8,152	9,681	10,903
Hydel share %age	1.81	2.01	1.43	1.18	1.09	0.95	0.82	0.70	0.80	0.86	0.90	0.81

The above ratio has a significant effect on the increase in power tariff. To cope with the increasing price of POL an additional component known as FAS (Fuel Adjustment Surcharge) was added in the tariff with effect from 1 July1978. Its initial rate was 4 paisa /KWH which has risen to 75 paisa /KWH with effect from. 10 August 1993. In fact the power tariff has increased to over 300% for medium size industry (70-500 KW) during the last four years. Most of the industrial units are now planning to have their own self-generation. Future power sector schemes, after translating the effects of the announced policies will be heavily tilted towards thermal generation, and will effect the future tariff.

The entire 3,912 MW future addition in the system till the year 1999 will be thermal oriented including 1,292 MW from Hub Power Project. With only 380 US $ per capita income, the power tariff is already beyond the capacity of ordinary Pakistani citizen at present. The effect of future price hike in wake of costly thermal generation is not very difficult to understand.

The comparison of power tariff for 500 KW and 2.5 MW load at 40% L.F. in different countries viz-a-viz per capita income will be certainly interesting in current situation:

COUNTRY	RUPEES/KWH 500 KW LOAD	RUPEES/KWH 2.5 MW LOAD	PER CAPITA $ GNP 1992 (WORLD BANK REPORT)
SWEDEN	1.36	1.72	2,3660
UK	2.25	2.58	1,6100
FRANCE	2.38	2.40	1,9490
SPAIN	2.76	2.97	1,1020
PAKISTAN	3.06	3.96	380
ITALY	3.22	3.50	1,6830
GERMANY	4.04	4.32	2,2320

Under the above situation, it will be very hard on the ordinary citizen to afford this level of power tariff inspite of claimed subsidy on the Ist slab of domestic consumers. In view of position explained above, Government should not totally excluded Public sector from Power Generation. There should be a balanced approach towards private as well as public sector involvement in the Generation, Transmission and Distribution of power.

ANNEX-A

PRIVATE SECTOR POWER GENERATION PROJECT FOR WAPDA STATUS AS ON 15TH JUNE 1996

1. PPAs SIGNED

16 Nos. PPAs have been signed so far as per detail given below:

i	AES Lalpir Limited Lalpir, Muzaffargarh.	362 MW
ii	Kohinoor Energy Ltd. Manga-Raiwind Road.	131 MW
iii	Southern Electric Power near Raiwind.	115 MW
iv	Saba Power Company, Rewat; relocated at Farooqabad (Shiekhupura).	109 MW
v	Fauji Kabirwala Power Company, Kabirwala.	157 MW
vi	Davis Energen, Fimkassar (Chakwal).	10 MW
vii	Northern Electric	6 MW
viii	Security Electric Power , Jamshoro.	310 MW
ix	Multan Power Generation , Shershah, Multan.	119 MW
x	Rousch (Pakistan) Power Ltd. , Sidhnai.	412 MW
xi	Japan Power Generation, Jia Bagga, Raiwind.	120 MW
xii	Power Generation System, Habibabad, Pattoki.	116 MW
xiii	AES Pak Gen. (Pvt.) Ltd. 2nd Project.	365 MW
xiv	Altern Energy Limited.	14 MW
xv	Consolidated Electric Power Asia Limited.	1,426 MW
xvi	Habibullah Energy Limited.	140 MW
	Total:	3,912 MW