

PN-ABI-952

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**PROGRAM DESIGN ISSUES AND OPTIONS —
PRIVATE SECTOR POWER PROGRAM IN PAKISTAN**

Prepared by

**Arthur D. Little, Inc.
Cambridge, Massachusetts**

and

**Bechtel Corporation
San Francisco, California**

For

**U.S. Agency for International Development
Islamabad, Pakistan**

January 1987

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BACKGROUND

The issue papers presented herein were prepared in support of the USAID Mission in Pakistan in its initiative to assist the Government of Pakistan to implement its policy to mobilize private sector resources to expand the capabilities of the power sector. The work included a visit to Pakistan by a three person team between the dates of October 7, 1986 and October 24, 1986, during which meetings were held with interested parties. These include industrial organizations which have expressed an interest in investing in power projects, public sector banks, foreign private sector banks, the Ministry of Water and Power, Karachi Electric Supply Corporation (KESC), the Water and Power Development Authority (WAPDA), USAID and other donor organizations, and the Chamber of Commerce in Lahore and Karachi. These meetings provided broad insights into the views of both public and private sector organizations which would be major players in any program to involve private sector resources in power generation and distribution. The meetings in Pakistan were followed up by meetings in Washington with USAID and the World Bank as part of the process of refining the issue papers.

The team consisted of:

Dr. W.P. Teagan, Arthur D. Little, Inc., Team leader.

Mr. John Swift, Arthur D. Little, Inc., Utility Systems

Mr. John Whalen, Bechtel Corporation, Utility Economics.

The work was done as part of Technical Services Order 11 under the Conventional Energy Technical Assistance Project (CETAP) (Contract Number LAC-5724-C-00-5126-00), administered by the Office of Energy, USAID, Washington. The contract is executed by Bechtel National, Inc., Washington, D.C.

USAID/PAKISTAN

PROGRAM DESIGN ISSUES AND OPTIONS -
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TABLE OF CONTENTS

Page Number

1.0	<u>THE NEED FOR PRIVATE SECTOR PARTICIPATION</u>	
1.1	Current Responsibility for the Power Sector	1-1
1.2	Imbalance of Supply & Demand	1-1
1.3	Funding Requirements	1-3
1.4	Institutional Constraints	1-5
1.5	Potential role for the Private Sector	1-6
2.0	<u>PRIVATE SECTOR INTEREST IN PARTICIPATION</u>	
2.1	Historical Perspective	2-1
2.2	Review of Current Status	2-3
2.3	Private Sector concerns	2-3
3.0	<u>BENEFITS TO PAKISTAN</u>	
3.1	Overview of Benefits	3-1
3.2	Discussion of Benefits	3-1
4.0	<u>PRIVATE SECTOR CAPITAL AVAILABILITY</u>	
4.1	Overview	4-1
4.2	Capital Needs Assumptions	4-3
4.3	Capital Availability and Sources/Foreign Exchange	4-3
4.4	Local Currency and Issues	4-6
4.5	Industry Views	4-8
4.6	Bank Requirements	4-10
5.0	<u>POLICY REFORM</u>	
5.1	Generation and Transmission	5-1
5.2	Distribution	5-3
5.3	Industrial Policy (relative to Power Sector Equipment Manufacture)	5-4
5.4	Electric Tariffs	5-5
5.5	Subsidies	5-6
5.6	Centralization of Positive Decisions	5-7
6.0	<u>INSTITUTIONAL REFORM</u>	
6.1	Institutional Issues	6-1
6.2	Institutions not Requiring Change	6-2
6.3	Institutions Requiring Change	6-2
6.4	New Institutions Required	6-4

USAID/PAKISTAN
PROGRAM DESIGN ISSUES AND OPTIONS -
PRIVATE SECTOR POWER PROGRAM IN PAKISTAN

TABLE OF CONTENTS (Continued)

	Page Number
7.0 <u>PROJECT SCOPE</u>	
7.1 The Perceived Problem	7-1
7.2 Project Objectives	7-1
7.3 Overview of Project Scope	7-1
7.4 Discussion of candidate Private Sector Activities	7-3
7.5 Implementation Strategies	7-9
7.6 Project Financial Resource Requirements	7-18

1.0 THE NEED FOR PRIVATE SECTOR PARTICIPATION

1.1 Current Responsibility for the Power Sector

Responsibility for the supply of electric power in Pakistan is held by the Pakistan Water and Power Development Authority (WAPDA) and the Karachi Electric Supply Company (KESC). WAPDA, an autonomous Government agency, serves all areas of the country except Karachi. KESC, a limited stock company with majority ownership held by GOP, is chaired by the Chairman of WAPDA. The two interconnected systems exchange power but have separate tariff structures for their customers.

Basic measures of size for WAPDA and KESC as of June 30, 1986 were as follows:

	<u>WAPDA</u>	<u>KESC</u>	<u>COMBINED TOTAL</u>
Customers	4.9 Million	0.7 Million	5.6 Million
Energy Sold 1985-86	15,500 Gwh	4,200 Gwh	19,700 Gwh
Rated Capacity Installed	4,924 MW	1,240 MW	6,124 MW

There are no other significant suppliers of power to the general public. Many industrial companies have installed generators, typically diesel units in sizes of 1 to 5 MW, to serve in whole or part their own electric power needs. This privately owned self generating capacity, which has arisen largely because of inadequacies in the public power system, is estimated to total 600 MW.

1.2 Imbalance of Supply & Demand

The WAPDA/KESC interconnected system has become increasingly unable to meet the demand for power. The most dramatic evidence of this is widespread load shedding, which reached a peak of over 1600 MW (about 40% of connected load) in January, 1986. Load shedding of lesser but still disruptive magnitude has occurred in half or more of the months of each of the last five years. The cost to the nation of this load shedding in lost industrial productivity alone probably exceeds 6 billion rupees (\$375 million) per year. Other significant problems such as a backlog of nearly

300,000 unfilled requests for system connections, energy losses of 25% of all power generated, and an inability to maintain planned system expansion rates also characterize WAPDA/KESC's operations.

The Sixth Five Year National Energy Plan (1983-1988), noting that electric energy consumption in 1983 was growing at over 12% annually and that load shedding of up to 1000 MW had occurred in the winter of 1982-83, mandated an increase in system capacity from 4809 MW in 1983 to 8,604 MW by 1988, (an increase which would require an annual system generating capacity growth rate of 17.75%). Capacity demand growth was to be held to 9.6% annually through energy conservation measures. By 1986, at the plan's midpoint, these objectives were expected to result in an installed system capacity of 6,764 MW and it was expected that load shedding would be eliminated in the year 1986-87.

The Sixth Plan's objectives are not being met. Installed capacity is now 600 MW less than was planned for 1986. The schedule for future generation installation now calls for a total WAPDA/KESC capacity of 6,764 MW by June, 1988 (which is an annual growth rate of only 7.2% in the 1983-88 Sixth Plan period), reflecting delays in the implementation of system expansions planned for Lakhra, Multan and Kalabagh. Peak demand for the combined systems is seen by WAPDA's Planning Department as growing at an average annual rate of 11.4% (or more if the pace of village electrification increases) in the 1983-88 period; and the seasonality of hydro power, which still supplies two-thirds of the system's electricity, aggravates the problem of meeting this growing peak. At rates of capacity and load growth now foreseen, load shedding will continue to be a major problem for many years past the end of the Sixth Plan period.

Recognizing this, in 1985 the Prime Minister directed WAPDA to prepare a plan for eliminating load shedding on a nation-wide basis by January, 1990, and also to electrify 90% of the country's villages by June of that year. In a two-part plan published in February and March, 1986 WAPDA outlined the effort required to meet the goals of the Prime Minister's mandates. Under this plan generating capacity of the combined WAPDA/KESC systems is to be increased from 6,164 MW in 1986 to 10,174 MW by June, 1990, a capacity growth rate of 1,000 MW per year. Peak demand is to be

constrained to annual growth of 10.9% from 1987 to 1990 through an energy loss reduction and peak load management program, and village electrification is to be accelerated. The WAPDA plan offers full accomplishment of the mandates but requires an average annual development expenditure from 1986 through 1990 of 22 billion rupees increasing thereafter to an annual average level of 44 billion rupees in the years from 1991 through 1993 to maintain necessary system growth.

Funding at these levels would be at levels from 2 to 3 times the current annual national electric power development budget in immediately coming years, and higher thereafter. Most observers judge WAPDA's plan to be extremely optimistic, given known financial and institutional limitations. WAPDA has important programs underway to improve utilization of available capacity through system upgrading, energy conservation, reduction of system losses, and institutional reorganization. These have the potential for adding as much as 1,000 MW to effective system capacity (by reducing existing losses and plant derating factors) but they will require a number of years for accomplishment. Even with these important programs, the supply - demand gap is likely to continue well into the 1990's unless a major new approach to resolving the problem is made.

Any new approach must recognize and deal with the funding and institutional constraints which severely limit WAPDA's ability to expand and improve the national power system. These questions are addressed below.

1.3 Funding Requirements

WAPDA's expansion is funded through an Annual Development Program (ADP) approved by the GOP. The amount of the ADP for the year ending June 30, 1987 is 8.5 billion rupees, up from 7.0 billion in 1986 and 5.0 billion in 1985. At present approximately 37.5% of the average ADP (average of last year, this year, and next year's projected ADP) is self-financed by WAPDA. An agreement with the World Bank, which is supported by the other major donors, requires the self-financing rate to be 40%. The balance of the ADP has historically been provided by the GOP as an allocation from the National Development Budget, of which the electric power sector currently

receives about 30% of the total. WAPDA also has an independent capability to borrow funds from the public through issuance of development bonds. For the first time in 20 years WAPDA plans to go to the market in the near future, with a 2 billion rupee bond issue at a probable interest rate of about 12%.

The mandated programs, to eliminate load shedding and accelerate rural electrification while adding 1,000 MW per year to system capacity, far exceed the funding capability of WAPDA and the GOP. Even a growth rate of half that per year, at 500 MW, would require annual capital investment of about 15 billion rupees for power plants and associated transmission and distribution facilities, i.e. a 60% increase in the over-strained current ADP budget. It is essential to mobilize funds from new sources to meet the goal of reliable power.

The World Bank has recommended that revenues from the sale of electricity be increased by an average of about 20% each year from 1986 through 1990 to maintain the agreed upon self-financing level of 40% of capital development costs. Sales tariffs were increased 10% in 1985, the application of fuel adjustment charges is being broadened in 1986, and a 15% increase in tariffs is under consideration for 1987; but this rate of progress will not provide WAPDA's essential contribution to capital development funds. WAPDA is working toward increasing sales revenues through reduction of losses from theft of electricity and from slow collection of billings for electricity sold. Elimination of these losses could add 500 million rupees a year to revenues, but major progress in this direction is tied to institutional reform and will take some years to achieve.

WAPDA's ability to provide capital development funds out of sales revenue will probably not exceed an average of 5 billion rupees per year in the 1986-1990 period. At a 40% self-financing rate this WAPDA contribution could not support an ADP exceeding 12.5 billion ruppes.

With respect to borrowing in local markets, successful floating of a 2 billion rupee bond issue would ease the strain in 1987, but WAPDA's ability (or desire given its low current, average rate of return of about

6%) to continue to raise funds through bonds issued at competitive domestic market interest rates is problematical.

An annual financing gap of the order of 10 to 15 billion rupees (in domestic funds and foreign exchange equivalents) appears to exist between what WAPDA can reasonably expect to raise and what is needed for capital development of a fully reliable and greatly expanded power system in the 1990's. This gap is equivalent to the funds needed to install from 350 MW to 500 MW of generation capacity and all the associated transmission and distribution facilities, annually.

These funds must come from new sources.

1.4 Institutional Constraints

WAPDA would experience severe difficulty in managing any significant expansion of its on-going development program even if it had adequate funds. WAPDA has grown enormously since it was created in 1959 (from 278,297 to 4,877,000 customers, from 781 million kWh to 15,504 million kWh in annual energy sales) and now has about 120,000 employees posted in approximately one thousand field offices; but it is still organized in basically the same manner as when it was created 27 years ago. It continues to use the same planning, procedures and technologies that it inherited from its predecessor organizations. The only changes of real substance have been a series of governmental actions to curb WAPDA's autonomy, and all or most of these have had negative results.

Among WAPDA's management problems are over-centralization of authority, delays in decision making, inadequate training and utilization of staff, excessive replication of organizational units, and poor record-keeping in lower levels of the organization. Corrupt practices in WAPDA's relations with customers result in theft losses which in some parts of the WAPDA system exceed 10% of the power delivered to distribution lines.

WAPDA's practice over the years has been one of cellular growth. New operating divisions, each fully staffed, are added in direct proportion to increases in generating capacity, length of transmission and distribution

lines, and numbers of customers. The practice, still continuing, has resulted in an excessively large organization. An expected doubling of WAPDA's system capacity and customer load by 1993 would result in a further massive and unwieldy growth of WAPDA unless major new approaches to managing system growth are introduced.

Some of WAPDA's managers recognize these problems and are pushing corrective steps through an institutional improvement program developed with the assistance of USAID-funded consultants under the Rural Electrification Project. A combination of measures in institutional restructuring (autonomy and decentralization of WAPDA's distribution functions), training, and the introduction of new procedures and technologies is in progress but substantial institutional inertia and some outright opposition is being encountered. Even if successful it will take years for these measures to overcome years of neglect and become effective. The additional load of an accelerated development cannot be carried effectively by WAPDA during this transitional period.

1.5 Potential Role for the Private Sector

The private sector, through entrepreneurial investment and management, can potentially assume a major role in the permanent elimination of load shedding, expansion and improvement of electric service, reduction of losses and corruption, and general strengthening of Pakistan's electric power system.

The concept of such a role for the private sector has been a part of the GOP electric power sector policy for a number of years. The Sixth Five Year National Energy Plan (1983-1988), which was promulgated in 1983, states that "Policies are being formulated for encouraging the private sector to set up electricity generation facilities for bulk supply to WAPDA and KESC at predetermined terms and rates". A formal GOP policy was approved in August, 1985. The policy, after noting that adequate investment in power has been the principal reason for recent power shortages, states that it appears desirable to mobilize private resources for development of the power network. The policy states that privately operated generating units will relieve WAPDA of some of its future day to

day responsibilities and that power generation is a convenient point at which to introduce private participation. The policy notes that the role of private enterprise in the development of the power system could later be enlarged, in the light of experience gained in power generation.

In a notice to the public, published in November 1985, proposals for power generation in accordance with this policy were invited from the private sector. In summary, the notice states that:

- o The GOP will accept proposals from the private sector to install and operate thermal generation plants fired with fuel oil or indigenous coal. The policy may later be expanded to include other fuels.
- o Proposals from private investors are expected to offer a bulk sales price for energy, based upon an annual 60% plant factor and a suitable rate of return on investment. The GOP will evaluate the sales price on the basis of an estimate of investment costs of the proposed plant as if it were built by WAPDA or KESC. Provision will be made for price escalation on certain energy price inputs, particularly fuel costs.
- o Investments in power generation will be treated as industrial investments for tax and fiscal regulation purposes.

The manner in which this policy will be applied to specific private investments is still evolving. No agreement between the GOP and a private investor has yet been executed under the policy, but proposals from Pakistani investors are now being considered for three power plants (the 120 MW diesel plant at Hub-Chowki, a 50 MW coal-fired plant on the Lakhra field, and a 35 MW coal-fired plant at Quetta). The GOP is now seriously endeavouring to bring private investment to bear on the electric power supply problem.

The formally stated GOP policy still limits private sector investment to generation using oil and indigenous coal. Recent discussions with key staff of the Ministry of Water and Power and of the Ministry of Planning suggest that a wider range of private sector activity will be welcomed,

including the possibilities of operations in distribution, industrial estates with self-generation, small decentralized utility operations, and fuel resource development combined with generation. The range of fuels is potentially extendible to imported coal, low b.t.u. gas and renewables including small hydro.

The market for private investment in power in Pakistan is large. At its lower limit there is a shortfall of up to 500 MW of needed new capacity, in each coming year through the mid 1990's, which the WAPDA/KESC system will probably be unable to supply. But beyond that, there is an extensive area of operation in distribution and generation facilities in which the private sector, motivated by market factors, should be able to provide reliable power more efficiently (and hence more cheaply) than WAPDA. This will be especially true in customer interface areas of distribution, and in the operation of thermal generation facilities.

WAPDA can be expected to retain its predominant role in the planning, building and management of the large hydroelectric plants and of the backbone, high voltage transmission grid of Pakistan. Its ability to concentrate on those key areas will be improved by the extent to which private investors take on much of the responsibility for power distribution and thermal generation.

2.0 PRIVATE SECTOR INTEREST IN PARTICIPATION

2.1 Historical Perspective

There are precedents in Pakistan for private sector participation in electric power. These included the Rawalpindi Electric Supply Company (REPCO), the Multan Electric Supply Company (MESCO), and a number of smaller utilities which served smaller towns before they were connected to the grid.

These independent utilities generally operated smaller steam plants and diesel generators and in some cases, purchased power from WAPDA for distribution. After WAPDA was formed in 1958, it became increasingly difficult for the independent utilities to operate favorably as compared to WAPDA due, in large part, to WAPDA's preferential access to donor financing to develop relatively low cost natural gas and hydro resources. This combined with rapidly growing demand and government policies to extend service to unprofitable consumer classes (rural, etc.) exceeded the managerial and financial capabilities of the then existing independent utilities. This led to their eventual take-over by WAPDA in the 1960's and 1970's as it became increasingly unprofitable to operate and provide capital for the expansion of such utilities within the then existing government policy environment.

This experience indicates the importance of a constructive policy environment for private sector participation in power. It also is responsible for negative attitudes on the part of both public and private sector interests which must be overcome. The private sector interests refer to the experience as indicating how the government can force a private operator into an untenable position by virtue of imposing unrealistic conditions on their operation (rates, etc.) which are met by the government only by virtue of their access to donor financing or access to government funds (i.e., subsidized). The public sector interests, on the other hand, refer to the experience to indicate a lack of capability and commitment on the part of

the private sector to operate complex power generation/distribution systems.

2.2 Review of Current Status

Even before announcement in 1985 of the GOP policy on Private Sector Induction in Power Generation, there was considerable interest by the private sector in participating in power generation and distribution. This was reflected by several dozen proposals at varying degree of detail which had been submitted to the GOP for power generation using oil, coal, low Btu gas, pipeline gas and hydropower resources.

This clear cut interest by reputable industrial organizations, combined with a growing realization that public resources alone could not close the power shortage gap, helped convince the GOP that such a policy was opportune.

Many industries were also installing their own generating facilities with capacities often in excess of 5 MW - 10 MW. Several such industries made informal enquiries as to possibility of selling power to WAPDA and/or to nearby load centers (other industries, villages, etc.)

The intent of the GOP, as evidenced by its formal announcement of a specific private sector power policy, has further enhanced the interest of the private sector to participate in:

- o Development of power projects within the explicit scope of the policy. This interest is evidenced by the 13 proposals received for the Hub-Chowki project. In most proposals, the equity capital would be domestic.
- o The expansion and operation of portions of the distribution system via some form of private operated lease or franchise arrangements.
- o Generating power within industrial plants, probably via cogeneration systems, and being allowed to sell excess power to the WAPDA grid (and purchase from WAPDA under prescribed conditions).

- o Generating power for sale to industrial customers in government designated industrial sites, with the possibility of interconnection to the grid and bulk power purchase/sale arrangements with WAPDA.

Discussions with several dozen industry representatives and bankers indicated that their enthusiasm for investment in the power field was tempered by the potential practical difficulties of working with the GOP (slow decision making, slow payment, etc.) and by a general distrust that still exists between many private sector and government interests.

The primary prerequisite which most potential investors stressed in discussion was the need for "iron clad contract terms" governing such critical issues as:

- o Relation of sales price to rate of return, and governmental sales purchase arrangements.
- o Guarantees for foreign loans.
- o Payment guarantees.

Many private investors felt that with such guarantees they would commit resources if they could reasonably be expected to realize a 20% rate of return in equity and in addition have an upside potential if operational efficiency improves or (for generating plants) if power beyond the baseline allocation to the grid (now based on a 60% capacity factor) can be sold to the grid or to other purchasers.

2.3 Private Sector Concerns

As indicated above, private investors will, at least initially, be very cautious in their dealings with the GOP and require very clear and protective contracts. Both industry representatives and their bankers indicated, however, that once confidence is created in the process contract, issues should become easier to deal with. Primary contract requirements of concern to the private sector include:

a. Rate of Return/Purchase Price:

There is widespread agreement by the private sector that the terms of power purchase prices and other contractual arrangements between a private investor and the GOP must allow an after tax rate of return on equity of at least 20% to attract significant private interest. One reason for this is that a Pakistani investor can buy government-issued financial paper with an after tax rate of return as high as 17%; i.e., there are alternative investments involving little, if any, risk.

A 20% rate of return target for a privately operated power facility is actually lower than that normally required for industrial projects. Potential investors indicated they would accept this lower rate of return because:

- There is a potential for higher profits from an investor-owned generating plant if the GOP purchases more electricity than called for by the contract, a not unlikely possibility given the continuing power shortages.
- There is an assured market for the product, which reduces income uncertainties.
- There are potential capital gains since the private companies operating in the electric power field will usually be public limited companies on the stock exchange. Investors are aware, for example, that KESC stock has been a good investment over the last few years.

Most potential investors contacted viewed the 20% rate of return only as a calculational tool used to set an initial power purchase price or other financial terms, with higher or lower returns possible depending on operational efficiencies. This is consistent with the GOP private sector power policy. However, some expressed a concern that GOP regulation of a privately operated power facility might extend to include rate of return auditing and pressures for reduction of power sales prices if rates of return are seen as excessive by the GOP. This question will need clarification.

Investors considering private generating plants need clarification of GOP's intent to purchase power at a guaranteed annual capacity factor, which is 60% in the current policy. Annual energy output delivered to the grid might fall below 60% through no fault of the operator, and investors will need assurance of compensation, at some appropriate level, for power not purchased in that event.

b. Guarantees on Foreign Loans:

The cost of private power projects will usually be very equipment intensive with much of the equipment (at least for power generation facilities) coming from abroad. Some form of supplier credits, or foreign bank credits, and export credit agency loans is likely to be required for the foreign exchange loans which may comprise over 50% of the capitalization of large generating projects. Experience in Turkey and elsewhere where private power projects are planned, indicates that suppliers of such credits will require a government supplied guarantee. Those who provide foreign exchange debt capital to private investors do not want, in effect, to share in the risks of the project.

Guarantees on foreign loans will therefore be required to attract both local and associated foreign capital for large projects. Preliminary discussions with the national development banks in Pakistan indicate that the GOP might be willing to provide such guarantees, since by definition all such projects will have official sanctions. This issue will become clarified as part of the on-going Hub-Chowki power plant negotiations.

c. Payment Guarantees:

Most potential private sector investors and their bankers indicated that assurance of timely payment of bills submitted was an absolute prerequisite for financially viable projects. There is considerable concern relative to receiving payment from any public sector organization. WAPDA itself, for example, often has difficulty getting timely payment from other GOP organizations.

At least for the early projects, where the process is being established, private sector investors will want guarantees of timely payment, preferably through letters of credit established in the banking system.

Successful resolution of the three issues identified in 2.3 a, b and c is the minimum requirement for the private sector. It appears now that all three can be resolved in the spirit of current government policy.

d. Variable Cost Pass-Throughs:

Potential investors and bankers alike wanted strong contractual assurances that increases in variable costs beyond the control of the plant operators would be passed through in a timely manner. The timing of pass through provisions was of particular concern given the perceived slowness with which government agencies normally function and the serious consequences on project finances if pass through costs are not expeditiously approved in periods of rapid price fluctuations. This concept is already built into the current private sector power policy but will need clarification and definition as a prerequisite to quality as a good banking risk. Variable costs mentioned were those associated with fuel, labor rates, and even interest rates depending on the form of the financial package.

e. Other Contract Issues:

Some other issues which appear important to potential investors include:

- o Assurance that no import duties will be charged on initial imported capital equipment and on future equipment replacements. In principle, the government has agreed, but detailed agreements and clarifications are needed from the Central Revenue Board.
- o Clarifications and dialogue on the different formulas for transfer pricing.
- o Consideration of a generating plant capacity factor higher than 60% as a basis for pricing to permit economies of scale, and permission to sell directly, or wheel, power to other customers.

3.0 BENEFITS TO PAKISTAN

3.1 Overview of Benefits

The benefits to Pakistan of encouraging and providing active support for the private sector to play a major role in the power sector are considerable. These include:

- Reduced Load Shedding
- Reduced Public Expenditures for Power System Development
- Increased Industrial Efficiency
- Increased Tax Revenues
- Improved WAPDA Institutional capabilities.
- Earlier Achievement of Rural Electrification Objectives
- Establishment of Performance Standards
- Advantages of an Increased Role of the Private Sector in Economic development
- Reduced Energy Losses and Theft
- Improved Operational Efficiency of the Power Sector and Quality of Service.

These benefits are widespread and involve a broad spectrum of both government and private interests. As such, in establishing policies relative to private sector involvement in the power sector, a wide range of GOP interests should be involved including those in finance, industry, and agriculture as well as energy.

3.2 Discussion of Benefits

a. Reduced Load Shedding

The aggressive implementation of private sector power systems and improved distribution using, in part, private sector operation could expedite the elimination of or major reduction in the power shortages

projected by the GOP under their more realistic resource-constrained scenarios. Reducing power shortages will have major benefits. As indicated below the power shortfalls inhibit industrial expansion and reduce the capability to service rural areas which is a priority program both to enhance rural productivity and to increase the participation of rural population in national economic development.

b. Reduced Public Expenditure for Power System Development

The active participation of the private sector in power generation/distribution would reduce the pressure on the public purse in several ways:

- o If the private sector could add an average of 150 - 300 MW to the national power capacity in each of the coming years (a not unreasonable goal, since a clear demand exists for added capability in excess of this order of magnitude), in power generation alone it could reduce capital needs for construction by over \$1,000 million over the next six years. WAPDA has projected a development budget of 198 billion rupees (about \$4,700 million) from 1986 to 1992 in order to eliminate load shedding and accelerate rural electrification. However, it seems likely that WAPDA's realistic funding capability from public sector sources and foreign loans during that period will not exceed about 75 billion rupees (about \$4,700 million). The mobilization of private capital, therefore, will significantly reduce WAPDA and GOP financing needs.
- o To the extent that private sector addition of capacity to the system reduces load-shedding, WAPDA would derive additional revenues on the sale of power which would otherwise not have been available for sale. The loss in power sales via load shedding might be as high as 700 Gwh annually, which could result in an additional \$30 million per year in sales.

Similarly, as a private sector role introduces new efficiencies into distribution, increased power sales from reduction of distribution system losses could be achieved by WAPDA. Lost power sales due to distribution

losses now amount to over \$30 million per year (assuming losses can be reduced from the present system average of 15% to 10%).c. Increased Industrial Efficiency

The power shortfalls have major impacts on both industrial and agricultural productivity.

The most obvious impact is the loss of production resulting from planned and unplanned load shedding. A study recently performed for USAID by EBASCO-AEPES-ITECO, (Economic Cost of Load Shedding and Unplanned Breakdowns - Pakistan, expected to be published in 1987) found that for the year ending June 30, 1985, load shedding and unplanned outages resulted in economic penalties of about 6 billion rupees (\$375 million) for Pakistan's industrial sector alone. The study concluded that power not available due to load shedding would have an average economic value of 7 Rs/kWh (for industry across-the-board) and that the power not available due to unplanned electrical outages would have an average value of 12 Rs/kWh.

The loss of productions in the industrial sector has a ripple impact on the economy as a whole, which was estimated in the study cited above to amount to a further 2 billion rupees (\$125 million) in 1984-1985.

There are also economic penalties of load-shedding in the commercial and agricultural sectors not examined in the cited study, which will have significant magnitudes.

In addition, discussions with industrialists and their bankers indicate that many energy-intensive plants must now have a high level of self-generation to assure output and protect equipment. This need for relatively small self-generation units can increase capital and operating costs of industrial plants by 5-10%. Discussions with bankers indicated that their added costs often result in some new projects not being implemented at all. Such higher costs directly impact on the position of Pakistan's industry in international competition.

d. Increased Tax Revenues

The direct and indirect losses of production resulting from power shortages are also reflected in losses of government tax revenue, needed to finance ambitious development projects. The direct impacts of load shedding are reduced industrial profitability which directly impacts on tax income. Similarly, the reduced base of profitable industrial and agricultural enterprises, due to suppressed electricity demand, further reduces government revenues as compared to the case if adequate power were available.

e. Improvement of WAPDA Capabilities

WAPDA's long range development plans include large multi-purpose water control projects (e.g. Kalabagh and Basha) which will serve vital irrigation needs as well as providing new hydro-electric power from these projects. The GOP is currently unable to effectively focus attention on these and other longer term projects due to both financial and management constraints. As a practical matter, most WAPDA resources are focused on shorter term measures to relieve electric power shortfalls.

A vigorous private power effort focusing on distribution and thermal generation would help free up resources to address those long range projects which can only realistically be undertaken by the government.

WAPDA (Power Wing) currently has about 120,000 employees and this number could grow by 5,000 - 10,000 per year given current staffing pattern and growth policies. Over 80% of the employees are in the distribution function. It is widely recognized that this rate of growth is leading to major management problems and further inefficiencies in the system. Several GOP programs, being undertaken with donor assistance, are geared to reducing the rate of growth of WAPDA. An important goal is distribution function restructuring, in order to allow an increased consumer base without corresponding increases in the number of districts and/or employees.

Allowing the private sector to actively participate in the power sector will support GOP needs to reduce WAPDA's growth rate, improve its management capabilities, and reduce administrative problems. An additional advantage will be reduced training needs on the part of WAPDA.

f. Earlier Achievement of Rural Electrification Objectives

The GOP has a national objective of connecting in excess of 5,000 villages annually to the grid such that by 1990 over 90% of all villages have access to electric power. The specific, ambitious target of this objective probably could not be met by 1990 by any combination of public and private effort since the target envisions doubling the number of villages electrified to date in a four year period. But the objective is nonetheless a major statement of the GOP's intention to increase the participation of rural populations in national political life and to increase rural productivity. The current situation whereby Pakistan is self sufficient in most food products is, in large part, due to increased irrigation using electrified pumps. Achieving at least the spirit of the rural electrification goals is therefore important for the economic and political well being of the country. There is indeed a reasonable prospect of achieving the mandated goal of 90% village electrification by the mid 1990's, but the public sector will need major help if this is to be accomplished.

The timely achievement of these goals is currently compromised by the aforementioned serious financial and institutional limitations of WAPDA. Specifically, the capacity shortfalls make it counterproductive to accelerate the assumption of additional electrical loads, while the institutional problems in distribution (staffing, theft) increase the cost of rural electrification well beyond that which need be the case. For example, absent fundamental structural changes in the distribution function, achieving rural electrification goals would require adding 10,000 new employees per year - a prospect which is clearly untenable.

The ongoing Rural Electrification Project and planned reorganization of WAPDA to form a potentially separable Distribution Wing will help

alleviate the above problems associated with expanding the rural electrification expansion.

The proposed Private Power Sector Generation and Distribution Project will help in achieving the GOP objectives relative to rural electrification by:

- o Encouraging the addition of generating capacity over and above that which could be installed using WAPDA resources alone, thereby allowing for energizing more rural electrification networks.
- o Initiating the private operation of distribution areas (cooperatives, etc.) thereby reducing administrative barriers in WAPDA and improving distribution efficiency as measured by staffing requirements, bill collection, and losses (technical and administrative).

g. Establishment of Performance Standards

The near monopoly position of WAPDA and KESC in both power distribution and generation makes it difficult for high level officials to assess their performance and to evaluate the potential and means for improvement. In the United States, government operated utilities such as TVA are often compared to their private sector counterparts relative to such parameters as power plant heat rates, staffing levels, and consumer attitudes. This comparison has helped to set performance standards for both parties to the benefit of the public. In fact, the government operated utilities take pride in having efficiency levels comparable to the best offered in the private sector.

The introduction of private operation of both generation and distribution in Pakistan could likewise help establish performance standards which would assist the GOP to evaluate the performance of WAPDA/KESC and to initiate actions for their improvement. As a result, efficiency improvements associated with operation of privately operated facilities could have a high degree of leverage in accelerating similar measures in the public sector operations. This could be one of the major advantages of introducing private enterprise into the power sector since both

distribution and generation will remain a major government function for the foreseeable future even if the private sector initiatives are successful.

h. Advantages of an Increased role for the Private Sector in Economic Development.

It is well recognized that the increased participation of the private sector in oil and gas development has contributed significantly to large increases in output without corresponding requirements on scarce government financial resources. This is one example of the national benefits of a constructive policy relative to private sector involvement in economic development which can be reinforced by similar developments in the power sector. Discussions with the Planning Commission and ENERPLAN indicate that a private sector role in power is being factored into the 7th Five Year Plan which should help highlight the potential for private sector capital to relieve pressures on public expenditures and allow more resources to be directed toward critical education, health, and other social service functions.

A successful implementation of early power sector projects using private capital and management resources would, therefore, serve to further reinforce trends to increasingly rely on private sector initiatives as an integral part of the economic development process.

i. Reduced Energy Losses and Theft

Private sector operation of distribution systems via such mechanisms as cooperatives should include contractual provisions which provide the operators with major financial incentives to reduce both technical line losses and theft. Reduced losses could increase available electric power by 5 - 15% without corresponding increases in costs thereby greatly increasing the financial viability of such operations. The ability to directly participate in the financial rewards associated with such efficiency improvements may, in fact, be the primary motivation for inducing private sector interest in this field.

The potential for greatly reduced line losses in distribution systems, given proper motivations, has been demonstrated on several occasions. Cooperatives in the United States have reduced distribution system line losses to the essentially irreducible technical minimum (for rural systems) of 7%. In Bangladesh, cooperatives only five years old have relatively low losses of the order of 15%, with a low level of theft due to the direct stake all members have in keeping costs as low as possible and ensuring no one is taking advantage of the situation. Similarly strong incentives will exist for a profit motivated operator where such losses are directly subtracted from operating income.

As indicated above, experience indicates that those distribution areas operated by private sector will incur reduced energy losses and theft. The impact of this would, however, be highly leveraged per item g above, since such operations would serve as standards for the public sector to improve their operations in this regard.

4.0 PRIVATE SECTOR CAPITAL AVAILABILITY

4.1 Overview

As indicated in Section 1, there will be continuing capacity shortfalls on the order of 1000 MW even assuming a rather optimistic view of load growth and WAPDA capacity addition over the next 5 years. Eliminating or greatly reducing these shortfalls would be a minimum objective for the role of the private sector over this time period. The overall capital requirements to accomplish this objective would be about \$1 billion for generating equipment and associated facilities. In addition, the private sector might start playing a role in distribution during this time period with associated additional capital requirements. For example, starting a single cooperative distribution system with 25,000 customers could require about \$10 - 20 million.

The above figures could expand significantly in the longer term if the GOP augments its policy to accelerate the role of the private sector in power in order to be able to focus government resources on important social programs.

Achieving the above objectives involves large amounts of capital within the context of the private sector in Pakistan. This section, therefore, addresses several issues related to capital availability in Pakistan, and how this availability impacts on the potential role of the private sector in power. Issues addressed are:

- o What level of private sector participation in power could be supported by the available sources of both foreign exchange and local capital?
- o What are the likely sources of both debt and equity capital?
- o Would participation of the private sector at a sufficient level to make a substantial impact (for example 1000 MW over the next 5 years) significantly reduce capital availability

for other equally important industrial and agricultural projects?

- o What forms of "financial window" assistance from USAID and other donors would be needed to accelerate private sector at the desired level?

In order to get preliminary answers to the above questions, discussions were held with three of the national development banks which would be called on to provide financing, two of the American banks, and several industrial firms which have submitted proposals for power related projects. The views of these experts were supplemented by examining some of the economic data relating to capital flows in the country.

4.2 Capital Needs Assumptions

For purposes of having meaningful and quantitatively based discussions with the financial and business community it was assumed that about \$1 billion (Rs 16 billion) in capital would be required by the private sector over the next 5 years if its involvement is to significantly impact on the power sector. This amount of capital would allow for up to 1000 MW in generation facilities plus the start of one privately operated distribution project.

The distribution of capital needs was discussed assuming:

- o On average the capital needs of the projects are divided roughly 50% foreign exchange and 50% local currency.
- o The capitalization is 25% equity financing and 75% debt financing.
- o Most projects will be of a size which require that they be public limited companies. This, in turn, implies that over 50% of the equity be raised through the stock market.

Table 4.1 summarizes the implications of these assumptions as they influence the annual rate of capital formation. An additional assumption explicit in table 4.1 is that most of the equity capital is raised in Pakistan with the foreign exchange portion of the capital primarily used to purchase equipment which is only available abroad. This reflects the reality of most of the proposals currently under consideration relate to the Hub Chowki project and smaller scale (50 mw) coal fired projects. Large central station projects (500 MW+) might also be considered in the future which involve foreign equity participation such as is now the case with power projects under consideration in Turkey and Northern Ireland.

As indicated by Table 4.1, the base line capital requirements imply that about \$100 million (Rs 1.6 billion) in both foreign exchange and local currency financing would be required each year. Most of the foreign exchange would be in the form of debt financing of power related equipment. However, up to \$50 million (Rs 800 million) in local currency would also be needed in the form of equity with about half of this, \$25 million (Rs 400 million), raised in the stock market.

4.3 Capital Availability and Sources/Foreign Exchange

In 1984/85 Pakistan received:

- \$466 million in grants
- \$1.9 billion in official loans of which,
- \$1.2 billion was concessional, from bilateral and multi-lateral sources, with the remainder nonconcessional, but
- only \$275 million in private loans, with only \$29 million coming from supplier's credits and \$246 million from financial institutions, practically all of which was short-term trade finance.

Table 4.1

Capital Needs Assumptions

- o Total Private Commitments for Generation Over Next 5 Years - 1000 MW
- o Cost of Systems - \$1000/kW
- o Total Capital Requirements: - \$1 billion
- o Generation Mix results in about 50 - 50 split between foreign exchange and local currency requirements
- o Foreign Exchange - \$500 million (Rs 8 billion)
Local Currency - \$500 million (Rs 8 billion)
- o Annual Requirements (assuming 5 years)
 - Foreign Exchange - \$100 million (Rs 1.6 billion)
 - Local Currency - \$100 million (Rs 1.6 billion)
- o Equity Requirements - 25% of total investment
- o If most equity in local currency
 - Equity - \$250 million over 5 years
 - Equity - \$50 million per year (Rs 800 million)

Thus it can be seen private international commercial banks play a very limited role in the external finance receipts of Pakistan. That being said, it should be noted that according to preliminary interviews, the nationalized private sector suppliers of foreign exchange to industry, the development banks, particularly the National Finance Development Corporation (NFDC) and Bankers Equity, Ltd. (BEL), are liquid in foreign exchange, with both their own holdings and lines of credit from the Asian Development Bank and the World Bank, among others.

These intermediary foreign exchange banks charge the industrial private sector 11%, plus a 3% exchange risk fee. All foreign exchange loans must be approved by the Ministry of Finance. Applicants receive guarantees after their project is signed off on by the Cabinet's Economic Co-ordination Committee.

The bulk of foreign exchange financing is seen to be supplied by donors and thereby passes through official government structures (Ministry of Finance, Development Banks, etc.) before becoming available to the private sector. The absolute level of such resources is quite large compared to that anticipated for the private sector power programs. By contrast, the current level of more direct foreign exchange based loans to the private sector via suppliers credits and private loans is only about \$275 million. Most current power sector projects being proposed by the private sector also use these same resources, in part, due to the relatively favorable terms available as compared to the national development banks. For example, one proposer indicated that his purchase of European equipment and services was being done with a mix of supplier credits and government loans with an effective interest rate of 6%.

Since the development banks are entities of the Ministry of Finance, with their senior management appointed by the Ministry, the domestic private sector has little difficulty with foreign exchange guarantees from them. Whether developed country export credit banks and vendors of major power equipment component and their international bankers

will accept them is to be seen (Hub Chowki). Preliminary indications are they will seek guarantees directly from the Ministry of Finance and foreign currency availability guarantees from the Central Bank.

A major consideration for the ECC and the private sector investors is the terms offered in suppliers credits; particularly the relatively short terms of such loans which are usually about 5 years and rarely over 8 years. This short duration is not compatible with the long term nature of power sector projects and will negatively impact on their economics even with the low interest rates often charged.

4.4 Local Currency and Issues

Approximately half the capital requirements will be local currency debt and equity. For most of the projects about half the equity will have to be raised through public offerings on the stock market. It is, therefore, instructive to compare the probably local currency needs of a successful private sector power initiative with capital formation center in the industrial sector and with the overall value of the stock market.

Availability

The cumulative outstanding manufacturing debt as of September 30, 1985 was Rs. 32,135 million or roughly \$2 billion. For the period 1984/85 the following investments occurred:

- Agriculturally credit Rs. 10 billion (\$625 million)
- Industrial capital Rs. 2.6 billion (\$162 million)
- Energy, at roughly 40% of Government expenditure of Rs. 92 billion, Rs. 36.8 billion (\$2.3 billion)

Pakistan's Gross National Savings for the same period was \$3.74 billion equivalent or 11.2% of GNP, with Gross Domestic Investment of

\$5.41 billion or 16% of GNP. As of June 1985, currency in circulation amounted to Rs. 56,447 million or \$3,527 million. Scheduled banks' deposits as of March 1984 were Rs. 120,322 million or \$7,520 million, and national savings schemes, as of June 1984 held Rs. 32,449 million or \$2,028 million. Pakistan's local currency situation is very liquid. The only significant constraint identified in the preliminary survey is the credit limits imposed on the commercial banks (5 domestic, 17 foreign) by the central government.

As indicated above, however, the rate of capital formation in industry is only about \$162 million (Rs. 2.6 billion) as compared to the needs of the private sector power initiative of about \$100 million (Rs. 1.6 billion). The capital requirements of the power sector projects could, therefore, be a sizable percentage of all requirements in the overall industrial sector which would suggest that the power initiative could significantly influence the flows of capital between projects.

Role of the Stock Market

A well developed capital market is not now in place in Pakistan, according to those interviewed and the World Bank. There is no secondary market and about 30% of listed shares are controlled by management groups and public sector investment institutions. Due to the share ownership structure, of 353 listed companies in the Karachi Stock Exchange, only about 150 are traded. There are active daily markets in about 30 stocks. The industrial development and commercial banks appear to be the major players. They then sell paper to individuals with returns as high as 15%, non-taxed, to generate funds.

Stock Market equity amounts to Rs. 5.3 billion. The new private sector suppliers and distributors of power, floating Rs. 400 million per annum, would, therefore, require a significant increase in overall stock market value over a 5 year time frame. Assuming such stocks are relatively conservative, dividend-paying instruments (since they, in effect, have government guarantees for product purchase), they could both relocate investments from less profitable stocks and, preferably, attract new money from individuals into the stock market.

The rate of increase in stock market valuations was considered manageable by most of the bankers interviewed.

Role of Overseas Pakistanis

Only 14% of overseas workers' remittances find their way into the capital market (12% in bearer certificates and other savings instruments, 2% in direct investment). There is concern within the GOP relative to the low rate of savings in the country, in general, and that from overseas Pakistanis, in particular. It is postulated, however, by many in the financial industry that there is a significant amount of money which would be available for investments from overseas Pakistanis if attractive investment vehicles are made available. Even reported remittances are still running at almost \$2 billion annually and it is suspected that large amounts of unreported resources also exist. This is, therefore, a potentially large source of capital relative to the private sector power needs.

4.5 Industry Views:

The views and suggestions of officials from major development banks, and foreign commercial banks, as well as those of representatives of major firms which have submitted proposals to the GOP, were solicited in order to better assess the potential barriers raised by the availability of capital. There was good agreement among those contacted on most of the important issues including:

- o Foreign exchange in the amounts required can probably be raised through a combination of supplier credits, foreign loans, and the national development banks (NDFS, Bankers Equity, etc.)
- o Foreign providers of foreign exchange debt will require loan guarantees which have the direct backing of the GOP.
- o The availability of both debt and equity local currency may be more of an issue than that of foreign exchange. However, even here the bank

officials indicated that at the levels required, (\$100 million/year) local currency needs should be manageable. Larger amounts to further expand the private sector role were, however, viewed as becoming increasingly difficult to deal with.

- o The stock market was considered to be an important source of equity (and legally required in many instances) and the amounts required from this source (~ \$50 million annually) were considered to be realistic if good investments were offered. More than that has been done for cement and fertilizer investment.
- o The provision of capital in the amounts indicated should not seriously impact on capital availability to other industry sectors.
- o The current system can best deal with small to modest size projects (such as Hub-Chowki) and would probably have difficulty dealing with mega-projects due to their inherently higher risks, long gestation periods, and large capital requirements.

As indicated above, bank officials and industry both considered that the financial requirements could, in principle, be made available within the existing system - albeit with some reservations relative to the availability of local capital. This availability, however, would often be under conditions which would not be conducive to economic projects in the power sector such as:

- o Local debt from the development banks would be at interest rates of 14%.
- o On-lending of foreign exchange by the development banks is typically at 11% with a 3% currency risk fee (i.e. equivalent of 14%).
- o Suppliers credits and foreign loans are usually of relatively short duration (4 to 8 years) which are inappropriate for power sector projects.

As such, the availability of capital, per se, may not be a major barrier. However, the terms of this availability may not be consistent with the

needs of the power sector which are usually based on long term financing at the lowest rates available in the market.

4.6 Bank Requirements:

The national banks in Pakistan are very conservative organizations and will be as insistent as the private investors on having projects with a sound financial base. Two of the requirements indicated by all bank officials as a prerequisite for financing are:

- a tight sales contract allowing full pass-through of costs not controllable by the supplier; and
- irrevocable, revolving, automatically-triggered letters of credit on billings made to WAPDA or KESC.

Some bank officials also indicated that they would prefer that WAPDA or KESC themselves had some equity participation in the projects in order to better ensure their constructive role in implementation and regulation.

5.0 POLICY REFORM5.1 Generation and Transmissiona. Current Policy

In August 1985 the GOP, through the Ministry of Planning and Development, announced a private sector power policy which addresses specifically the private operation of indigenous coal or oil fired power plants selling power into the national grid. This policy, as described in Section 1.0, sets forth terms on which the GOP will purchase bulk power and invites private parties to make proposals. This is a constructive policy, the practical implementation of which is currently being tested by negotiations for a 120 MW oil fired plant at Hub-Chowki and two coal fired plants (35 MW and 50 MW at Quetta and Lakhra) being proposed by a prominent coal mining firm. The policy itself states that it may be expanded to include other fuel forms.

The Electricity Act of 1910 empowers the Government to issue licenses for the supply of electricity to various parts of the country. Two major organizations are licensed for this purpose: The Karachi Electric Supply Corporation (KESC), Ltd.; and the Water and Power Development authority (WAPDA). Industrial firms may also generate power for their own use and, due in part to wide-spread load shedding by WAPDA, there is about 600 MW of industrial self-generation now in place. Federal law does not address the question of the sale of power by one industrial operation to another, or of an independent power generator selling power to an industrial estate or other class of customer. Such operations would be under the jurisdiction of the provincial governments, and can be undertaken only after obtaining a license from the electric inspector of the concerned province. WAPDA cannot grant permission for such operations even if it were inclined to do so. No example of a private power generator attempting to go through this license procedure was uncovered in discussion with representatives of industry and WAPDA, although both these options are of considerable interest to industry. WAPDA, on the other hand, is reluctant to encourage

such sales since industrial customers are the most profitable under existing tariff structures and subsidize other customer classes.

b. Reforms Required

The current GOP private power sector policy provides a potentially constructive base from which to initiate a program to bring the private sector into power generation. However, the policy needs clarification, changes, and expansion in order to allow for the broader participation of private sector interests. Specific issues requiring further analyses include:

- o Explicitly extending the policy to include a wider range of energy source such as imported coal, low Btu gas, associated gas, small scale hydel and other renewables.
- o Extending the policy so that it can be more flexibly applied to smaller facilities (hydel, for example) where the bulk price, plant factor, rate of return analyses, and similar provisions of the current policy would either be difficult to interpret or inapplicable. This might include standard purchase price provisions for units below a certain size.
- o Modifying the policy to be less prescriptive in defining capacity factors, location, fuel type, technology and financial parameters so as to encourage greater diversity in response by the private sector.
- o Extending the policy to deal with the sale of bulk power to the national grid by industrial self generators and co-generators, permitting WAPDA to tap these generation resources to the benefit of all parties.
- o Extending the policy to include the sale of power by private generators to industrial estates or other companies. Industrialists are very interested in this option in order to gain economies of sale in power generation not attainable when each industrial plant produces power only for its internal needs. Steps should be taken to facilitate the provincial electric inspectors' licensing procedures, particularly where failure to do so will delay industrial expansion or where loads cannot be served effectively by the grid. Policies

governing the sale of power from such facilities to WAPDA should be governed by the GOP private sector power policy.

- o Extending the policy to provide for wheeling of power. In a well-developed private power sector it will be in the national interest to encourage private generators to sell power directly to distant bulk customers through wheeling on the national grid. Provisions for pricing and other terms of wheeling should be included in the policy.

5.2 Distribution

a. Current Policy

There is no prohibition in current law on the establishment of corporate entities (public or private) to buy bulk power from WAPDA for resale to other customers. The only restriction upon this mode of operation is the need to obtain a license to sell power from the electric inspectors' office of the cognizant provincial government.

There are examples in Pakistan of both private and public organizations purchasing bulk power from WAPDA and creating their own facilities for distribution and billing. Such examples include the Model Town Cooperative Housing Society in Lahore, facilities administered by military cantonments, and residential colonies attached to big industrial complexes. The basic legal policy environment for private sector distribution is in place.

In practice it appears that this permissive situation exists only when the distribution system purchases all its bulk power from WAPDA or KESC. No examples were found of organizations generating their own power, or purchasing bulk power from third parties, for resale.

b. Reforms Required

No new policy action is required in the case of a privately operated distribution system which purchases all its power from the grid. The

situation is less clear with respect to isolated small systems which have their own generating facilities. A policy clarification is needed here.

Also, the procedure by which a private party obtains a license for establishing and/or operating a distribution system needs review to determine if procedural changes are needed to facilitate the licensing process and make it less susceptible to political pressures.

5.3 Industrial Policy (relative to Power Sector Equipment Manufacture)

a. Current Policy

Much of the structural material and electrical equipment required in distribution systems at 11 KV and lower levels is manufactured in Pakistan, and the local industrial capacity can be expected to meet system expansion needs. Some items such as 11 KV cable accessories, 3 phase and single phase electric meters, 33 KV cutouts, lightning arresters and safety equipment are generally not now available from Pakistan manufacturers but could be manufactured locally for an expanded market.

WAPDA, as the principal purchaser of material and equipment for electrical systems, has historically procured from the nationalized sectors of Pakistan's electrical and structural manufacturing industry, particularly at the 33 KV and higher voltage levels. The market is not competitive. Pakistan's small private industrial firms are reluctant to invest in new manufacturing capacity for the electric power sector in the absence of an open, substantial market.

b. Reforms Required

WAPDA should be encouraged to procure more of its distribution system material from private sector manufacturers. Technical and financial assistance to increase private sector manufacturing capability may be required.

5.4 Electric Tariffs

a. Current Policy

WAPDA's average unit sales price for electricity (tariff plus fuel surcharge) rose from 12.2 paisas/kWh in 1970 to 63.8 paisas/kWh in 1985, increasing by a factor of 5.2. During the same period Pakistan's consumer price index increased from 100 to 512. The price of electricity for the average customer has thus kept pace with the cost of living.

Behind that statement are two significant problems. First, WAPDA's total revenues (from tariff rates and associated fuel surcharges) cover total operating costs but do not provide an adequate margin for investment in system expansion. Second, the tariff structure and applications of fuel surcharges are skewed so that residential and agricultural tubewell customers pay substantially less per unit than industrial and commercial customers. In 1985 the average residential customer paid 40.9 paisas/kWh, tubewell customers paid 35.3 paisas/kWh, while industrial customers paid 78.6 paisas/kWh and commercial customers paid 121.3 paisas/kWh.

In 1985 the average cost to WAPDA of delivering electricity (average across all customer classes) was 47.0 paisas/kWh. WAPDA delivered electricity to domestic and tubewell customers at less than its costs, which reflects an implicit policy to subsidize these consumer classes.

Current GOP policy, as agreed upon with the encouragement of major donors, is to reach a 40% self-financing goal for system expansion. In pursuit of this policy, WAPDA's tariff rates were increased 10% across the board on July 1, 1985 and an increase of 15% is being considered for 1987. A broader application of the fuel surcharge (which was not applied to domestic and tubewell customers prior to 1985) is being made in 1986.

For example, WAPDA will shortly be applying a fuel surcharge to large energy use residential consumers. Notwithstanding progress on this front, it appears that the 40% self financing policy is still not being achieved at this juncture.

The capacity shortfall problems are highly seasonal in nature due to the large impact of hydropower on the system. Nevertheless, the GOP currently does not have a consistent policy for accounting for this via seasonal and time of day tariff structures.

b. Reforms Required

The ability of the private sector to participate in power generation and distribution will be strongly influenced by the tariff structure. Overall low average tariffs complicate the task of establishing realistic buyback rates from private sector generators since there is a tendency to compare such rates with average consumer costs. Perhaps more importantly, the aforementioned low residential and tubewell rates complicate the task of establishing privately operated distribution systems having a significant representation of these consumer classes.

Consequently, the private sector power program should be used as one of the mechanisms for accelerating policy reform on the issue of tariffs. This should include more consistent application of fuel surcharges, better rationalization of tariffs by consumer classes, and expanded application of time of day and seasonal rates to reflect the realities of the power generation mix (seasonal hydro availability) and demand structure.

5.5 Subsidies

a. Current Policy

There are at present at least two significant areas of subsidy in the electric power sector.

One is the subsidy aspect of the tariff structure which favors certain consumer classes, discussed above. Another area of subsidy, also inhibiting the growth of the electrical system and hence inhibiting industrial growth, is the back-subsidy of WAPDA to the central banking system of the GOP through WAPDA's payment of debt service on capital invested in WAPDA plant. WAPDA's debt service in the year ending June 30, 1985 amounted to 2,413 million rupees, about 36% of its total 1985 ADP

expenditures of 6,696 million rupees. The GOP charges WAPDA at rates of 11% to 14% for the capital funds. These funds come entirely from the international donor community as grants or concessional financing, at rates substantially below those levied by the GOP upon WAPDA. This augmentation of WAPDA's debt service payments reduces WAPDA's ability to finance needed system capacity expansion. There are counter-balancing GOP subsidies to WAPDA, including a preferentially low price for fuel oil and favored tax treatment for electric power equipment, which should also be considered.

Based on the above, WAPDA officials claim that their organization is "subsidizing" the central government rather than vice versa. Also, WAPDA might claim that the ability of private sector investors to obtain low cost financing (supplier credits, etc.) might actually put them at an advantage relative to WAPDA when accessing the economics of power generation and distribution systems.

b. Reforms Required

The impact of subsidies upon the rates of return of invested capital in the electric power sector should be examined and quantified. Since WAPDA's costs and rate structures are used as benchmarks for rate of return analyses of private sector ventures in electric power, these subsidies may distort determinations of the financial feasibility of private sector operations.

5.6 Centralization of Positive Decisions

a. Current Policy

Delays in public sector decision-making are cited, by industry and government representatives alike, as likely to become significant impediments to early effective introduction of private investment in the electric power field. WAPDA, in particular, is perceived as having an inability to make early positive decisions at middle and upper management levels. This appears to reflect an excess of caution on the part of managers who do not wish to take positive decisions without prior assurance that such a decision will meet with approval from superiors and policy makers. The problem exists elsewhere in the government as well.

The expectation of long delays in acting upon new initiatives discourages potential investors.

b. Reforms Required

Habits of mind are not easily reformed, but reiterated clear exposition from high levels of GOP policy on private sector participation in power could predispose public sector managers to act with confidence, and in a timely manner, upon new initiatives from the private sector.

Also, the policies should be supported by institutional arrangements which help ensure timely decision making. This will be particularly important in the negotiation of contracts, providing timely interconnects, and allowing for variable cost pass throughs.

6.0 INSTITUTIONAL REFORM

6.1 Institutional Issues

A constructive policy environment is certainly a prerequisite for significant private sector investments in the power sector. However, of equal importance will be the establishment of an institutional framework which can effectively implement the policies. Such implementation will require that there exist an ability in the GOP to:

- o Modify and expand policy statements to reflect changing priorities and economics.
- o Define and promulgate opportunities (locations, fuels, capacities) for private sector participation in power.
- o Set technical specifications for private power which are reasonable while still protecting the interests of the GOP.
- o Receive and review technical/financial proposals expeditiously so that private parties are not kept waiting for replies for long periods of time (and with diminishing levels of interest).
- o Negotiate agreements in a timely manner.
- o Establish appropriate regulatory functions (for example, with distribution franchises).

Several private sector representatives felt that the long drawn-out procedures normally associated with working with the government could be a major barrier to having significant results from the stated GOP policy of promoting private sector investment in electric power. It is critical, therefore, that appropriate institutional reforms be encouraged in the concerned entities.

A number of existing institutions will play important parts in the implementation of the private sector investment policy. These include at least the Ministries of Water and Power, Planning & Development, Petroleum and Natural Resources, Finance and Industry and - at the next level of the Government - such agencies as WAPDA, the State Bank of Pakistan and the National Development Banks, and ENERCON. The Provincial Governments have decisive roles in licensing and franchising. Private sector institutions such as Commercial Banks and the Chambers of Commerce will also play a part. The employees union of WAPDA may also have an impact in structuring staffing plans for WAPDA facilities, in generation or distribution, which are operated under contract or franchise by the private sector.

Changes in the modes of operation of some of these will be necessary if an aggressive policy of private sector participation in electric power is to succeed, and some new institutional elements will be needed. The nature of the required changes is discussed below.

6.2 Institutions not Requiring Change

The basic structure of the ministries and the national banking system is given; it is an environment to which the new policy will adapt. Changes in these institutions are not expected. Desirable changes in policy with respect to enlarging the scope of the private sector's participation in power, or easing the flow of capital for such investment, can be made within the existing institutional frameworks. However, within the Ministries at a next level down some new institutional developments could be desirable.

6.3 Institutions Requiring Change

a. Strengthening the Private Sector Policy Implementation Capacity at the Ministry Level

There is not now a formal GOP process for implementing the private sector policy. Policy development and negotiations with private sector

interests are handled by the Additional Secretary (Power) of the Ministry of Water and Power on an ad hoc basis. No technical staff is associated with the Additional Secretary's office for this purpose. A technical staff unit, which might provisionally be called the Private Policy Implementation Board, should be established in the Ministry of Water and Power. Under the direction and authority of the Additional Secretary (Power), this Board will:

- o Maintain an overview of the implementation of the GOP private sector power policy, making recommendations to the GOP for modification and expansion of policy as appropriate to reflect changing priorities and economics.
 - o Coordinating with the Ministry of Planning and Development and WAPDA, define and promulgate opportunities for private sector participation in power.
 - o Promulgate technical specifications developed by WAPDA for the private sector.
 - o Publicize and promote, through solicitations, seminars, speakers and publications, the concepts of private sector participation in power.
 - o Receive and review expeditiously technical and financial proposals from the private sector, advising proposers of the status of reviews and likely decision dates.
 - o Negotiate and execute agreements on behalf of WAPDA/KESC in a timely manner.
- b. Implementing the WAPDA Private Sector Cell

WAPDA has announced that it intends to establish a Private Sector Cell within the Power Wing. This cell would interface with private parties in such areas as:

- o Stipulation of technical standards and specifications for interconnection and power quality.
- o Load dispatch modes.
- o Overview of contract performance.

The cell is not as yet created and no special training is now planned to enable its staff to deal effectively with the set of complex issues which experience in the U.S. indicates will arise. This action by WAPDA requires further support.

The broader institutional changes planned by WAPDA in the Institutional Improvement Program developed under the USAID Rural Electrification Project, including the eventual de-linking of distribution functions from WAPDA, will enhance the prospects for effective introduction of private sector investments and rural electric cooperatives into the electric power distribution area.

6.4 New Institutions Required

Several functions of importance to the success of private sector operations in electric power will require the development of new Government entities for their execution. The following should be considered:

a. Public Utility Commission

As the number of private sector generators and distributors of power increases, and as the private sector becomes involved in the sale of power directly to customers through industrial estates, wheeling and distribution, it will become desirable to establish an independent Public Utility Commission (PUC) to maintain an overview of the operation of private sector power suppliers. The PUC will:

- o Establish guidelines and regulations, in accordance with relevant Pakistani law, for determination of tariffs and other terms of service for the supply of electric power to consumers.

- o Review and approve private sector proposals for establishment of new services, or changes in existing services, involving sales of power to consumers.
- o Audit and regulate private power supplier operations with respect to tariffs and other terms of service.
- o Arbitrate, in the national interest, problems of conflicting interpretations of regulation and contract which arise between WAPDA, private power suppliers, and consumers.

The primary purpose of a PUC is to ensure the equitable operation, in the public interest, of power systems involving the delivery of power to consumers by a franchised private supplier. Another important purpose is to adjudicate equitably the interests of private generators and the national grid operators (WAPDA) in the continuing supply of power to the grid by private sector suppliers. Countries in which essentially all electric power is generated and delivered by government-owned power authorities (the present case in Pakistan and other lesser developed countries) have not created PUC's. In these countries tariffs and terms of service are typically determined by government policy. We look therefore, to the successful experience of countries with extensive market-driven privately-owned power systems, the U.S. and Canada, for models for a Pakistan PUC.

The application of this experience to Pakistan's needs was discussed at length with the Chairman of one of the most active state PUC'S in the United States. Based on this discussion it is recommended that a Pakistan PUC consist of an autonomous board of three members. The members should be lawyers/administrators of high stature and recognized probity, selected by as high a level possible in the government (the Prime Minister as selector would be desirable), nominated for long terms which should at least be longer than the constitutional term of the government which nominated them. Members should be secure against removal from office before term completion. They should be well paid, to help to place them beyond the reach of influence from parties with

special interests. It is considered important that members should not come directly from a WAPDA or a private industrial background, in order to assure not only impartiality in balancing the interests of WAPDA, the private investors and the consumers but also the public perception of impartiality.

The PUC will be supported by a small technical staff of engineers, economists and accountants capable of analyzing electric utility operations, cost and rate requests.

When fully evolved, the PUC will regulate electric power suppliers through a quasi-judicial process, in which a private power supplier, desiring a rate change or other change in its mode of operation vis-a-vis the public, makes a formal application for such change to the PUC. Advertised hearings, open to the public, will be held on such applications. The PUC will obtain a full presentation of arguments, pro and con, concerning each application. If no qualified consumer body comes forward to contest a supplier application the PUC will call upon its own technical staff to prepare and present a case against the request. The purpose of this is to ensure that all relevant arguments pro and con are brought out and are placed in the record of the hearings. The PUC, making its decision on the basis of evidence presented in the hearings, will have a balanced set of arguments and facts to review.

It is important to note that a PUC for Pakistan is not a condition precedent to the establishment of viable private sector operations in electric power. The need will arise as the role of the private sector, initially limited to generation of bulk power for sale to WAPDA, matures into a system of private sector deliveries of power, from a variety of sources, directly to consumers.

The concept is new to Pakistan, but the recognition of a need to regulate private suppliers of power in the public interest has already been enunciated by senior officials of the GOP. The PUC is the vehicle for that future regulation.

b. Rural Electrification Agency

In the event the GOP determines to utilize electric cooperatives as a vehicle to achieve its rural electrification targets, a new agency will be required to develop and administer the program. The agency should be established by a law (or ministerial directive) which sets forth duties and responsibilities to include the following:

- o Secure concessional financing to re-lend to the cooperatives for construction of electric distribution systems.
- o Organize cooperatives
- o Provide training for cooperative Boards of Directors and staff.
- o Establish engineering and construction standards
- o Establish accounting & financial standards
- o Providing training for local engineering and construction firms to design and construct rural power systems.
- o Provide technical assistance to the cooperatives in management, accounting and finance, operations and maintenance, member services, productive uses and conservation.
- o Monitor the cooperatives' performance to ensure compliance with established standards and to ensure that their loans are repaid on schedule.

The agency should be placed under the jurisdiction of the Ministry of Water and Power for policy guidance and direction.

7.0 PROJECT SCOPE

7.1 The Perceived Problem

Summarizing information presented earlier (in Section 1.0), Pakistan's government-owned electric power systems have become increasingly unable to supply reliable power for the nation's needs. This is the result of financial and institutional constraints which cannot be overcome by actions taken in the public sector alone. The industrial costs of power shortages, and the heavy demand upon the national exchequer for funds to strengthen the public power systems, are inhibiting Pakistan's economic growth. In consequence, the GOP now seeks as a matter of policy to bring private sector resources to bear in expanding Pakistan's electric power capability.

7.2 Project Objectives

A USAID project to address this problem is proposed. The goal of the project is the achievement of a reliable, efficient electric power system for Pakistan, in which the private sector has a significant role in power generation and distribution. The immediate project purpose is to stimulate private sector participation in the electric power field, through assistance to the GOP in the reform of policies and institutions to create an enabling environment and through direct financial support of selected GOP activities.

7.3 Overview of Project Scope

The project will involve USAID action to encourage a range of candidate investment activities by private sector enterprises and a range of parallel enabling actions by agencies of the GOP.

a. USAID Support for Private Sector Actions

Private sector ventures in electric power will be considered in three principal areas:

Power Generation, in which the private sector will be encouraged to contribute capital and management resources to increase power generating capacity in the country.

Distribution, in which the private sector will be encouraged to enter into the distribution and sale of electricity directly to consumers. Successful implementation of such activities will contribute to reduced system losses and reduced requirements for GOP capital and management resources.

Electric Sector Equipment Manufacture, in which private sector firms in Pakistan will be encouraged to provide quality equipment to the power sector, with associated decreases in costs and increased domestic investment and employment opportunities.

The project will not include power transmission since this function is critical to the overall functioning of the country-wide system and can appropriately remain solely in the hands of the central generating and transmission authority, WAPDA. However, access to the transmission lines under reasonable conditions can be expected to become a future issue to allow wheeling of power between points of private sector power generation and selected bulk consumers.

The need for wheeling arrangements has, in fact, already arisen (although not so identified) in the concept of executing a contract between KESC and a private supplier of power from the proposed Hub Chowki plant. KESC is normally a net exporter of power to WAPDA, and power delivered to KESC from the new 120 MW capacity at Hub Chowki will normally be transferred directly to WAPDA over the 220 KV intertie to Jamshoro. KESC's function will effectively be that of a wheeler of power between a private supplier and its ultimate bulk customer. Rate structures which equitably compensate supplier, wheeler and ultimate user of bulk power will need to be developed.

b. USAID Support for GOP Actions

The GOP will be assisted in the implementation of policy and institutional reforms taken to create an environment in which the private sector can act

effectively and in order to improve efficiency and service in both public and private sector operations in electric power. An important element of this assistance will be the development of financial windows to catalyze private investment. Other areas of assistance to the GOP will be in definition of the role of the private sector, determining procedures for concluding GOP-investor agreements, power sales rate setting and regulation, promotion of private sector activities, and redefinition of WAPDA's role.

In addition, technical assistance will be provided to the GOP and, on a cost-sharing basis to private investors, for pre-feasibility studies of selected opportunities for private sector involvement in specific electric power projects.

Disbursement of project funds to the GOP through performance payments, upon accomplishment of defined project milestones, will be considered as a mechanism for funding GOP activities in this project.

The proposed USAID project will be closely coordinated with on-going programs of other donors (e.g., ADB support of WAPDA's distribution system rehabilitation and loss reduction program, and the World Bank's Support of the WAPDA's thermal power plant upgrading program). In addition, the direct participation of the World Bank will be sought in the establishment of a financial window for the private power sector generation and distribution project. Informal discussions with World Bank officials have already taken place and it is anticipated that the Bank will give favorable consideration to joint financing of this aspect of the project.

7.4 Discussion of Candidate Private Sector Activities

Eight principal areas for private sector involvement in electric power have been identified. These are discussed below. All are potential candidates for inclusion in the project.

a. Installation/Operation of New Generation - Selling Power to National Grid

This is the activity specifically envisioned in the enunciated GOP policy on Private Sector Induction in Power Generation. Entrepreneurs will build
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and operate new generating plants, selling power directly to the national grid under negotiated contract terms. Activities in this area have the potential for adding rapidly to the firm capability of the national grid, up to 1,000 MW of new capacity by 1990, and can make the earliest large impact upon power shortages of any option open to the GOP.

This initiative is the first foray by the GOP to allow private sector participation in the power sector. Private sector investors will, therefore, be viewing the implementation of the policy as the acid test of GOP interest and commitment.

b. Installation/Operation of New Generation for Industrial Estates

In this activity investors will build and operate new generating plants at industrial estates, selling power directly to industrial customers.

A significant percentage of major Pakistani industrial establishments are or increasingly will be located in industrial estates ranging in size from 10 to 5,000 acres. Power capacity needs in these estates may range from 10 MW to over 100 MW. Development on these estates is generally slowed by the lack of reliable power. Pakistani industrialists have indicated an interest in generating and distributing power in such estates.

Private investment in industrial estate generation will relieve WAPDA of the need to use its limited resources to service large new industrial loads, and will accelerate development of industries which would otherwise be unable to obtain early, reliable power at affordable costs. When connected to the national grid, industrial estate generating plants have the potential of selling power to WAPDA when the balance between grid demand and estate demand permits. This will be a significant source of new firm capacity for the national grid only when industrial estate generating plants are built with excess capacity for the express purpose of selling to the grid.

Enabling actions by the GOP will be required to encourage private investment in industrial estate generation, but no major legal or policy barriers to this appear to exist. WAPDA, however, will probably be reluctant to

forego potential sales of high-tariff power to industrial customers, since industrial power sales currently help to cross-subsidize residential and tubewell customers. Tariff rationalization, as it becomes effective, will mitigate this concern by its reduction and eventual elimination of cross-subsidies in tariff rates.

c. Energy Resource Development for Power Generation

Private sector investment in resource development for power generation can potentially create new power capacity for Pakistan which would either not be developed, by public sector initiatives alone, for many years, or are inappropriate for development by the public sector due to their small size.

The use of indigenous energy resources for power generation should be particularly encouraged via the private sector power policy. These resources include low Btu gas fields (such as Uch), small and medium scale hydro resources, indigenous coal, and biomass resources. The effective utilization of these resources will require extensive resource assessment studies which in some cases could be quite costly - for example, in the case of low Btu gas field assessments. The use of these resources for power generation could be accelerated by programs to support the up front resource assessment activities needed before specific power projects opportunities can be identified and planned.

d. Decentralized Utility Operations

There has historically been a need in Pakistan for the establishment of small decentralized utilities, particularly in rural areas which are poorly served (or not at all served) by power from WAPDA's national grid. Such free-standing rural systems have been operated as government-owned entities. There is an opportunity to expand such service and to provide efficiency of service through private sector operation. This can also serve the USAID objective of satisfying the existing customer base before adding new customers. The mode of operation could take several forms, including cooperatives and privately operated franchises. Such "utilities" could:

- o Purchase bulk power from the grid and be responsible for distribution system operation, maintenance, metering, billing and collection.

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- o Generate power locally, without grid connection, using diesel generators, small hydroelectric plants (or other renewable resources), and operate the distribution system as above.
- o Combine both bulk purchase and generation activities in supplying its distribution system.

Decentralized utility operations could assist WAPDA in achieving the targets of the rural electrification program, improve rural productivity, provide income generation in rural areas and increase WAPDA net reserves (since line/theft losses and revenue collections would be the responsibility of the distribution system operators).

e. Electric Cooperatives

Electric cooperatives, which have been reasonably successful in Bangladesh, India, Philippines and several countries in Latin America, could play a major role in achieving the GOP target of electrifying 90% of the villages at the earliest possible date. Their widespread replication in Pakistan would relieve WAPDA of a major portion of responsibility for rural electrification. This would enhance WAPDA's ability to concentrate on improving efficiency of service, reducing system losses and enhancing revenue collection in urban areas, as well as freeing its managerial staff for the central WAPDA function of planning and building long-range hydroelectric and transmission capability for Pakistan.

In its typical form the electric cooperative in Pakistan would be organized, owned and operated on behalf of a group of 20 to 30 thousand customers in a rural (or possibly urban) district. It would normally buy bulk power from the national grid, distributing it to its members through a cooperative-owned distribution system.

Experience indicates that cooperatives are self-policing in the areas of system efficiency, energy theft and bill collection because they are owned by the people they serve.

Widespread introduction of cooperatives requires some institutional development (notably the creation of an agency of the GOP to guide the

program) and substantial initial donor subsidy to bring cooperative districts into operation. Once launched, the system could be self-financing.

f. Contract Management of Government-Owned Generating Plants

A recently completed power plant rehabilitation study indicated that WAPDA financial and management constraints have led to significant operational problems at many of the thermal power plants, such as poor maintenance, derated outputs, and high fuel consumption. These problems not only result in plants not producing up to specifications but also in serious misdirection of WAPDA management attention away from crucial capital expansion issues.

The unit costs of electric power produced at a generating plant operated under such conditions are significantly higher than unit costs at a well-managed plant, thus contributing to high system costs and lowered revenues for WAPDA. In addition, revenues are lost as a result of shortfalls of salable power.

One way to improve this situation would be to contract with a private sector company, on an experimental basis, to operate one or two government-owned power plants. The contract would provide that the higher revenues (or cost savings) attributable to improve plant efficiency are to be shared between the WAPDA and the operator. An appropriate plant for the experiment would be the small coal-fired plant at Quetta, or a similar small facility which appears to consume a disproportionate amount of management energies.

Models for such operations in Pakistan do not now exist, but contract power plant operations of a similar nature have been successful in Arabian Gulf countries, often with Pakistani expatriate nationals as the operators. Contract operation, under Pakistani investor management, could set a profit-driven standard for operational efficiency in WAPDA's older plants.

g. Privately Operated Distribution Franchise

Under WAPDA reorganization plans, the distribution function will be placed in a potentially detachable wing with increased levels of accountability
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54

and autonomy. This will provide major incentives to reduce losses, optimize capital expenditures, and improve labor productivity. In support of this trend the WAPDA Distribution Wing might consider granting one or two distribution franchises to the private sector on an experimental basis for a specified time period. The franchise contract would call for splitting any saving resulting from improved operating efficiencies between WAPDA and the operating company.

There have been recent expressions of interest, by qualified Pakistani private firms, in undertaking franchised distribution operations under such circumstances.

A multiplicity of issues would be raised in the granting of distribution franchises. The project could provide assistance to the GOP in examining such questions as:

- o Selecting service areas that reflect the overall mix of consumers so that the private party is not at an advantage (or disadvantage) relative to the rest of the system.
- o Determination of bulk purchase rates from WAPDA.
- o The level of flexibility in setting consumer tariffs, which could be different than the national structure.
- o The level of flexibility in operations (manpower levels, rate and location of new service connections, etc.)
- o The nature of the incentive system for efficient operations.
- o Responsibility for capital improvements.
- o The mode of selecting and buying for capital improvements, and the review of decisions by an oversight body.

This option should receive serious consideration in the USAID project design, given the anticipated doubling of system customers expected over the next five years and the associated strain on WAPDA management, technical, and financial services.

h. Electrical Equipment Manufacture

The planned rapid expansion of the electric power sector will require major increases in the supply of associated equipment. WAPDA indicates there is

no reliable high quality indigenous supply of such basic equipment as transformers, power sector control capacitors, and insulated cable, essential for transmission/distribution system expansion. Little of the equipment required for power generation is currently made in Pakistan. The availability, quality and efficiency of Pakistani-manufactured end use equipment is often questionable, particularly for high use equipment such as motors, pumps, air conditioners, refrigerators, and freezers. An indigenous fabricating ability exists for power boilers, but it has not been drawn upon for the needs of the electric power system.

Exacerbating the problem of local supply of high quality, cost competitive equipment is a prohibition on the private sector supplying equipment to WAPDA above 33 kv and a lack of efficiency standards on end use equipment.

The project could support GOP efforts to encourage the private sector to produce appropriate high quality, cost-effective, equipment to serve both supply and end use needs because

- o The expansion of the electric sector increasingly provides a critical size of market for efficient manufacture.
- o The public sector companies are not adequately serving the needs of the sector in these capacities where it has monopoly.
- o The requirement to purchase even basic supplies from abroad increases the cost of the expansion process.
- o The quality of equipment needs upgrading to improve efficiency and, thereby reduce capacity expansion needs (particularly end use equipment).

7.5 Implementation Strategies

The objective of the project is to support the GOP in accelerating the role of private resources in improving and expanding the power sector. A primary consideration of project design is an approach which is quick-disbursing, requiring only limited, long-term, in-country staffing for its implementation. The project will focus support on those areas and institutions which will be most influential in creating an enabling environment for private investment in power. In keeping with the overall design objective, the USAID project will:

- Establish financial mechanisms which will make capital available to private investors for financing long term projects in the power sector.
- Provide technical assistance and training for development of the GOP institutions which will implement the private sector power program.
- Finance (or co-finance) feasibility studies of larger projects which will accelerate their implementation and provide exposure for U.S. firms interested in participation.
- Include provisions for assisting the GOP in establishing basic power infrastructure, such as energy resource development, transmission lines, roads, water and other preparatory site work needed to set the stage for private power projects and to facilitate their implementation.

a. Financial Windows

The economics of private sector power projects will be critically dependent on both the availability and conditions of debt and equity capital. As noted in Section 4.0, discussions with industry and banking sector representatives indicate that details of financing structure can have a major impact on project viability.

Additionally, it is still not clear that capital in the amounts required can be raised through existing mechanisms without straining the financial system and siphoning off capital from other important development projects. Even where foreign exchange is available, it is often for relatively short terms (up to 8 years) which is not consistent with the financing needs of power sector projects.

It appears, therefore, that some form of "financial window" could play an important role in accelerating the rate at which the private sector gets involved in the power sector. As indicated on Table 7.1, there are several options such a window can take and any program could involve more than one mechanism. These mechanisms fall into three broad categories:

- o Providing financial guarantees which might be critical for the projects to proceed. These guarantees could take several forms including foreign exchange guarantees, payment guarantees for power delivered, and assuming foreign exchange risks.

Table 7.1
Financial Support Options

<u>PROJECT OPTIONS</u>	<u>PROS</u>	<u>CONS</u>
1.0 Guarantee foreign exchange loans (if U.S. companies)	<ul style="list-style-type: none"> - Leverages use of resources - Reduces resistance of GOP (as compared to where they guarantee the loan) - Minimal administrative requirements 	<ul style="list-style-type: none"> - Not yet clear that this is a major problem - Probably not in itself sufficient to greatly improve prospects for U.S. manufacturers - Does not actually use pipeline funds assuming sound projects are implemented
2.0 Provide financing mechanism consistent with needs of Power Sector (long term, lower interest rates, etc.)	<ul style="list-style-type: none"> - Could significantly improve project viability - Puts U.S. companies in favorable position - Reduced administrative requirements (within USAID) - Leverages project funds - Use pipeline funds quickly 	<ul style="list-style-type: none"> - Not clear whether consistent with GOP policies - Might result in increasing cost of project (companies might bid higher equipment cost if it is known that financing charges will be lower)
3.0 Performance Payments to GOP	<ul style="list-style-type: none"> - Could simplify USAID administration - Might directly impact on policy or institutional reform. - Results in large disbursements thereby reducing pipeline problems 	<ul style="list-style-type: none"> - Could indirectly result in significant flow of USAID funds to Japanese and European manufacturers

Table 7.1 (Continued)
Financial Support Options

<u>PROJECT OPTIONS</u>	<u>PROS</u>	<u>CONS</u>
4.0 Supplement Power purchase (for early systems)	<ul style="list-style-type: none"> - Might result in project approval that would otherwise not have occurred. 	<ul style="list-style-type: none"> - May result in proposals having higher rates than would otherwise be the case (knowing that a subsidy was available)
5.0 Support cost of "Forward Cover" Insurance	<ul style="list-style-type: none"> - Reduces cost of financing and, thereby lower costs - May provide U.S. firms with competitive advantage - Relatively easy to administer 	<ul style="list-style-type: none"> - May not be acceptable to GOP
6.0 Provide direct financial support for development of cooperatives	<ul style="list-style-type: none"> - Can be implemented using standard USAID mechanisms - Relatively modest administrative requirements - Could take 2 - 3 years to get going resulting in pipeline problems. 	<ul style="list-style-type: none"> - Does not bring in private capital in early stages
7.0 AID Equity/Transfers to University or Foundation.	<ul style="list-style-type: none"> - Might help accelerate project implementation - Can be used to assist U.S. firms - Might have low administrative requirements. 	<ul style="list-style-type: none"> - Might not be consistent with AID Policy

- o Providing both debt and equity capital under conditions consistent with the needs of viable power sector projects (lower effective interest rates, longer duration, grace periods, etc.)
- o Providing direct support to the GOP via performance payments which can both accelerate implementation of policy reform and compensate for real or perceived financial shortfalls resulting from implementing specific private sector projects.

Table 7.1 indicates the pros and cons of these mechanisms as they relate to factors of importance to USAID such as:

- level of administrative oversight required
- level to which the mechanism results in private power sector projects which otherwise would not have been implemented
- degree to which the mechanism results in more participation of U.S. firms in supplying equipment and technical services.

Of particular importance, impacting on project design, is the last issue of how these financial mechanisms enhance U.S. commercial interests. Clearly, USAID financial resources would not be used to directly support the purchase of non-U.S. equipment. On the other hand, restriction of financial support via the mechanisms of Table 7.1 to projects involving U.S. companies (or only Pakistani Companies) could significantly restrict the acceleration of private sector power in Pakistan since often the lowest cost equipment might be available from closer Asian suppliers.

The Project Paper preparation process will need to further examine the various financial window mechanisms in order to identify those which meet a reasonable combination of accelerating the role of the private sector, taking into proper consideration U.S. commercial interests, and being acceptable to the GOP.

One institutional approach for implementing a financial window which was recommended for consideration by a World Bank official is to establish a Private Power Finance Corporation, whose capital resources are supplied jointly by USAID and other donors. This corporation might be a semiautonomous organization along the lines of Sui-Northern Gas Corporation.

Its functions could include reviewing proposals for their financial soundness, providing equity and debt financing under terms suitable for long range power projects, and possibly providing some of the financial guarantees needed to attract both foreign and local capital.

b. Technical Assistance and Training

The focus of technical assistance and training will be on strengthening and helping to establish those institutions which will both establish policies relative to private sector participation in power and be responsible for policy implementation. The organizations include the Private Sector Policy Implementation Board in the Ministry of Water and Power, the Private Sector Power Cell in WAPDA, the Public Utility Commission which may be established to adjudicate the interests of the public sector utilities, private investors and the general public, and a body set up within the Ministry of Water and Power to implement a program of rural electric cooperatives and other forms of privately operated distribution systems. Technical assistance and training provided to these organizations could include:

- Assistance in organizing a Private Sector Policy Implementation Board in the Ministry of Water and Power as well as direct technical assistance to the Ministry in reviewing proposals for private sector ventures in power, establishing contract terms, and negotiating contracts. This assistance will be critically needed in the near term, while the institutional capabilities of the GOP to formulate and implement privately funded projects in the power sector are being established.
- Assistance to WAPDA in training staff for the WAPDA Private Sector Power Cell. This training, in the development of performance and operational standards and procedures for interconnection of public and privately operated power systems, would be given to selected WAPDA staff in courses of several months duration conducted in the United States in cooperation with investor-owned and government-owned utility systems. Limited technical assistance through counterpart on-the-job training in Pakistan will also be provided. Special attention would be given to the development of technical

specifications and procurement standards for equipment, to be provided by the WAPDA Private Sector Power Cell as guidance to potential private investors in the power field. Such specifications and procurement standards could help to broaden market opportunities for the Pakistan electric equipment manufacturing industry.

Provision of expert advice to the GOP on the functions and organization of a Public Utility Commission to oversee and ultimately to regulate the delivery of electric power to the public from private power sources. A PUC is not needed in the early stages of private sector participation in power, when the principal mode of service is the supply of bulk power, to the national grid, by a private firm. A relatively straightforward contract between the investor and WAPDA can be monitored by the parties concerned. The situation changes as many private generators and distributors begin to serve a variety of customers, particularly in franchised service areas. The PUC concept should be evolved in Pakistan as the roles of private suppliers grow, so that a fully articulated PUC, well-adapted to Pakistan's needs, can be ready to assume responsibility for equitable protection of public and private interests in power delivery when the need arises, as it will within the next few years. The assistance provided by the project could take the form of high-level advice in Pakistan to the GOP, furnished by individuals with extensive experience in the management of PUC's in the United States, plus training courses in the United States, in association with one or more operating PUC's, for Pakistani engineers, economists, lawyers and accountants who will serve as technical staff to the Pakistan PUC.

Assistance in establishing an operating Pakistani agency for the development and continued guidance of small independent distribution systems, particularly rural electric cooperatives. This assistance would probably take the form of a small technical assistance consulting team, working with a Pakistani counterpart team, to develop contractual arrangements, technical standards, and organizational and operational procedures for independent distribution system operations.

This team would also develop procedures for disbursement, application and monitoring of the loans and grants necessary to start up small distribution systems and would provide on-the-job training for rural electric cooperative owner/operators. Training grants would be provided to send Pakistani organizers of rural distribution systems to Bangladesh, the Philippines and the U.S. to study successful operations in those countries.

- Providing training for private sector managerial and technical staff, on a cost-sharing basis, in private sector utility operations in the United States.

c. Feasibility Studies

Both power generation and distribution projects in the power sector tend to be complex undertakings requiring preliminary studies to determine technical and economic feasibility before major financial commitments can be made for design and implementation. The cost of feasibility studies can be substantial, particularly in view of the fact that they are undertaken during a high risk stage of the project development.

USAID can accelerate the formation of well planned private sector projects by providing financial support for the feasibility phase of project development. Ways of doing this could include:

- Establishing a feasibility phase study fund similar to that operated by the U.S. Trade and Development Program. This resource would be available for use by U.S. companies which show a serious intent of working jointly with Pakistani firms in developing projects involving U.S. equipment or technical expertise.
- Co-funding feasibility studies of selected power sector, investment opportunities conducted by Pakistani investors, with the USAID-supplied funds to be paid back by the investor if the project is successfully implemented.
- Undertaking feasibility studies requested by the GOP, with potential examples being:

- Identifying and establishing engineering parameters for sites which could be used for larger power plants to be installed by the private sector.
- Assessing the availability of energy resources (hydroelectric, low Btu gas, etc.) which could be used for power generation.
- Examining the technical and financial feasibility of obtaining private sector contract management for one or more of WAPDA's older thermal generating plants, identifying sites and contractual arrangements.
- Examination of the markets for domestic manufactured and imported equipment for expansion and maintenance of Pakistan's electric power systems, with a determination of the feasibility of upgrading Pakistan's domestic manufacturing industry to supply quality products to meet a larger share of the needs.
- Identifying distribution areas which might be operated by the private sector and assessing the economic feasibility of such operations. The results of these studies could be used to interest potential private operations.

d. Infrastructure Support

The costs of developing some elements of the necessary infrastructure for electric power systems (basic fossil fuel resources, extensive access and transport facilities, for examples) are such that they cannot feasibly be borne by investors in the context of relatively small power plants. The low rates of return resulting from including the costs of infrastructure in plant development costs would rule out any private development of the facility.

This situation may arise where a gas or coal field, needed as a fuel resource for a proposed power plant, requires further site exploration for proving of reserves. It may arise if adequate electrical transmission facilities are not available to carry a new power plant's output to load centers; or if water supplies, or roads or other transport facilities needed to service a remote power plant site are not in place. Other

examples of facilities needed to make a new power plant operational, but the cost of which cannot economically be recovered by feasible rates of return on equity, might include necessary upgrading of electrical grid dispatch and control systems to handle plant output, or the upgrading of a distribution system connected to the plant.

In such cases USAID may consider financing directly, through the appropriate GOP agencies, the necessary resource development work (surveys, drilling and assessment) and the necessary infrastructure design and construction for the GOP, as required to bring the proposed new power site to the state of readiness at which it becomes economically feasible for private investors to develop a power project.

7.6 Project Financial Resource Requirements

Estimates for project financial resource requirements are summarized in Table 7.2. As indicated, the project could utilize from 330 to 450 million dollars in fiscal years 1988 through 1992, assuming that GOP policy and institutional reforms result in achieving near-term objectives. The five year project period will be crucial for laying the groundwork for an expanded role of the private sector in generation, distribution and equipment manufacture in years beyond 1992. Therefore, much of the resources expended during the period for financing, feasibility studies, technical assistance, training and infrastructure will support power developments which will come on line after the year 1992. A range of funding levels is suggested for each element of the proposed project.

Table 7.2

Project Financial Requirements - Fiscal Years
1988 through 1992

ITEM	REQUIREMENTS RANGE MILLIONS OF DOLLARS
Financial Facility (Window) [See Note 1 below]	
- Loans to private investors) 185 to 250
- Loans to cooperatives	
- Foreign exchange guarantees) 7 to 10
- Power purchase payment guarantees	
Performance Payments to GOP [See Note 2 below]	
- Upon organization of Private Sector Policy Implementation Board	2 to 3
- Upon expansion of private sector power policy to include other energy sources plus cogeneration and distribution	4 to 5
- Upon execution of contracts for each 150 MW of new private power generation (in addition to Hub-Chowki and other plants in negotiation prior to start of USAID project), \$4M (or \$5M) up to a total of 165 OMW	44 to 55
- For each 50 MW of new generation capacity installed in industrial estates selling power directly to industrial customers, \$3M (or \$4M) payable after one full year of operation, up to a total of 500 MW	30 to 40
Feasibility Studies of Power Development [See Note 3 below]	
- Infrastructure: energy resource development, site studies, and transmission	
- Identification of sites for new private power operations and for contract management of existing generating plants	3 to 5
- Distribution district privatization	
co-financed with private investors	
- Shared-cost studies with U.S. supplier firms (Modeled on U.S. Trade & Development Program)	
- Shared-cost studies with Pakistani private investors in power	7 to 12
Technical assistance to the GOP for institutional development	
- Private Sector Policy Implementation Board	
- WAPDA Private Sector Power Cell & standards development	3 to 5
- Public Utility Commission	
- Rural Electric Cooperative Agency	

Table 7.2 (Continued)

Project Financial Requirements - Fiscal Years
1988 through 1992

ITEM	REQUIREMENTS RANGE MILLIONS OF DOLLARS
Training support	
- GOP staff	
- Private sector operating staff	3 to 5
Direct funding for GOP infrastructure needed to facilitate private investment in power [See Note 4 below]	
- Low BTU gas field development	
- Renewable resource development	
- Site preparation for power sites	
- Transmission tie-lines to take power from potential private power sites to non-adjacent existing grid	42 to 60

Notes for Table 7.2

1. Private investment is assumed to be \$200 million/year, resulting in \$1,000 million total investment, split 50%-50% between foreign exchange and local currency. 25% of total is equity and 75% is debt. It is postulated that financial window funds 25% to 33% of debt (foreign exchange and local) and guarantees all foreign exchange loans it does not fund.
2. Performance payments are made to provide incentives for action by the GOP and to reduce USAID administrative burden.
3. Assume 6 to 10 feasibility studies for the GOP at \$500,000 each plus 10 to 20 prefeasibility studies at \$200,000 each and 10 to 20 feasibility studies at \$500,000 each performed by/for private investors on a cost-sharing basis. These study costs are consistent with experience on comparable U.S. trade & development program projects.
4. Assumes 7 to 10 projects in a mix of transmission lines, site preparation including roads and water, renewable resource development and fossil energy resource development, with an average project cost of \$6 million. A typical project could be a 40 kilometer HV transmission tie-line with substations.