

1

Concept Paper
Private Sector Power Generation and Distribution Project

Dr. Robert F. Ichord, Jr.
Chief, Energy and Natural Resources
Bureau for Asia and Near East
AID Washington

May 7, 1986

I. Background

Pakistan is entering an historic period when the political and economic energies and resources of the private sector are being released to create a new and hopefully more democratic society. Internal and external political forces are placing pressures on the government to be more responsive to private interests and to solve critical development problems.

One GOP response to this situation is manifest in the August 22, 1986 Policy Statement on "Private Sector Induction in Power Generation," contained in Annex A. The statement outlines an initial framework for stimulating private investment in power generation. The new initiative is based on the following premises: (1) the shortage of public investment; (2) the need to decentralize responsibilities for implementation and relieve some of the burden on WAPDA; and (3) the appropriateness of power generation for private participation.

Over the past several years, the shortage of electricity has increased especially during the low-hydro months, and has led to growing criticism of the GOP and WAPDA. The Sixth Five Year Plan in 1983 acknowledged a serious electricity load-shedding problem. But while estimating that load-shedding would rise to 840MW during the low water months in 1983/84, it was forecast to improve in subsequent Plan years and be eliminated by the end of the Plan period. This forecast is not being realized due to delays in major planned projects. Peak load-shedding continues to be over 1000MW out of a WAPDA system of about 5000MW.

In response, the industrial sector is increasing their purchases of generating units. Total on-site generating capacity is projected to increase from 433MW at year-end 1985 to about 600MW by the end of 1986. A growing fraction of on-site power systems will be operated year-round and sized to meet full plant requirements and not just stand-by needs. Most will be run on imported diesel oil.

The Prime Minister in April 1986 announced a policy to eliminate load shedding by January 1990 and to assure that ninety percent of all villages in the country are electrified by June 1990. WAPDA has submitted a plan to achieve this objective. It is estimated to cost Rs. 116 billion and will require annual tariff increases of about 23 percent over the next four years to permit a WAPDA self-financing ratio of 40 percent. The Government is currently considering this

Plan and the tariff increases that will be instituted this year as part of its general budget presentation.

At the same time, AID is working with WAPDA on the reorganization of its distribution function and the creation and staffing for a separate distribution wing has finally been approved. Consideration is now turning to the privatization of certain distribution services. Considerable political support seems to exist for this notion as a way of improving the efficiency of service and reducing system losses, enhancing revenue collection, and reducing the size and centralization of WAPDA.

In sum, it is a propitious time for AID to help stimulate changes in policy on private sector participation in both generation and distribution.

II. Project Description

A. Problem Definition

This project addresses the problem of how to assist the GOP in implementing and refining its new policy to attract private investment in power generation as well as helping the GOP to formulate a policy on private sector participation in power distribution. The essence of the problem is as follows: how to establish an environment in which (1) WAPDA is willing to buy power from private producers on a basis that is attractive to private producers with capacity of varying sizes; (2) the GOP is willing to sanction not only private participation in generation but also private involvement in distribution and retailing; and (3) private companies feel secure in a power generation investment that is designed at least in part to sell electricity to the grid or directly to consumers.

The problem is a complex one involving political, legal, economic, financial, and technical considerations. A basic political issue is the nature and extent of government control over power generation and distribution. Various degrees of government regulation and participation are possible both with respect to the ownership of the generation and distribution facilities and the conditions and standards that private producers would have to meet. Of key importance in Pakistan is the relationship of Federal and Provincial authorities on decisions of what capacity is established and where.

The problem also involves a large number of related legal considerations that range from land rights for the facilities and liability for accidents to contractual mechanisms for buying, retailing, or wheeling power and for dispute resolution.

The power generation business is characterized by substantial economies of scale. A policy to promote private investment in power generation, while perhaps reducing the burden on public resources in

this sector, may contribute to a less than optimal investment pattern from the stand-point of national resource allocation and perhaps from the stand-point of economic security if the fuel used is imported as opposed to indigenous in origin. The issue of the size, efficiency, capacity utilization, fuel source and busbar cost of the electricity produced are all key economic considerations in developing an effective national policy.

With respect to distribution, private interests will gravitate toward retailing in more lucrative and easily managed markets, leaving the government with the low income, low saturation markets of the rural areas and remoter towns. Can service areas be defined that are both attractive to private companies as well as inclusive of some of the more high cost and lower income areas.

The financial conditions and implications of government policies and regulations are of course critical to the problem. Important financial aspects include: the price and schedule for WAPDA purchases of electricity; provisions for price escalation; taxes and duties; investment incentives for domestic and foreign capital; convertibility of currency and repatriation of profits; the costs of safety and environmental regulations.

The interconnection of electricity producing units of differing sizes and characteristics poses technical issues for which clear standards and operating procedures need to be developed. Such things as limits on voltages, frequency, harmonics and power factors influence the impact of the private supplier on the stability and reliability of the grid system. Metering, maintenance schedules and dispatching procedures require coordinated efforts between the private producer and the WAPDA system.

B. Project Goal and Purpose

The project goal is to establish efficient, privately-owned power plants selling electricity to the national system and to involve the private sector in distributing electricity to consumers. The purpose of the project is threefold: (1) assist the GOP in developing an effective policy and institutional framework for the promotion of private investment in power generation and distribution; (2) provide assistance to interested private investors in preparing feasibility analyses and packaging investment proposals; (3) assist the government in soliciting and evaluating proposals and in system planning; (4) leverage equity investment from private sources in Pakistan and outside into feasible projects.

C. Expected Achievements/Accomplishments

The principal outputs of the projects will be the following:

-- the improvement and expansion of the GOP's current policy to induce private sector investment in power generation;

- substantial movement toward economically rationalized electric tariffs of at least Rs. 1 per Kwh;
- the establishment of a Private Power Development Board that would review and approve proposals from the private sector, establish rate formulas, help resolve disputes, franchise distribution and retailing ventures, and issue technical standards for private power producers and retailers;
- the installation of at least 300MW of private electricity generating capacity;
- the establishment of a private energy finance facility that would provide concessionary financing for power plant equipment and services and related resource development exploration and production if a sufficient private equity contribution was also forthcoming;
- the improvement of WAPDA's systems planning capabilities in generation and transmission;
- the experimentation by WAPDA of contracting out to the private sector of distribution functions in specific service areas;
- the execution of at least one demonstration project in which the private sector company will not only generate but also retail electricity on either a contract basis with WAPDA or a full franchise basis (e.g. in an industrial park).

D. Project Outline/Components

The project is envisioned as seven-year, \$340 million project (AID funding only) having three main components: (1) policy and planning; (2) proposal development and promotion; (3) private energy finance facility.

1. Policy and Planning

This component would provide short-term technical assistance and training help to the GOP to implement and refine the private sector policy of August 1985 and expand it to cover distribution of electricity. The consultants would help to: (1) evaluate lessons learned from projects such as Hub Chowki and Lakhra and from successful experiences in private power generation in other countries; (2) analyze and recommend institutional arrangements for private generation policy implementation, such as a Private Power Development Board; (3) provide systematic input of private sector views on GOP policies and implementation procedures; (4) help develop appropriate purchase price methodology and model standard contracts; (5) provide training in U.S. utilities with substantial PURPA experience in dealing with private power producers; (6) assist WAPDA in developing technical specifications for grid

interconnections; (7) improve WAPDA's generation and transmission planning and modeling capabilities and help analyze the implications of various private sector generation projects, schemes and longer-term scenarios for the stability and economic expansion of the system; (8) provide technical comments on private sector proposals submitted to the GOP; (9) analyze the potential for the establishment of electricity cooperatives and other forms of private involvement in electricity distribution. Five million dollars is the illustrative budget for this component.

2. Proposal Development and Promotion

The project would provide financing to interested parties for the preparation of project feasibility studies and promotional efforts to obtain financial support for the project. Financing for prefeasibility studies would be made on a grant basis, not to exceed \$300,000. Funding of full feasibility studies would be made available on a risk-sharing, pay-back basis if successful. The limit per feasibility study would be \$2 million, with a requirement that at least 25 percent of the total feasibility amount would be provided by the borrower. The amount tentatively allocated to this component is \$30 million.

3. Private Energy Finance Facility

Power generation projects are capital intensive and it is likely that the debt to equity ratio permitted for private sector plants would be on the order of 70 to 30 percent. Consequently, appreciable debt financing will be required. Until enough confidence is established to permit regular commercial financing of the debt portion of project investment, non-commercial financial resources will need to be made available. This component will therefore support a private sector energy finance facility that will make available concessionary finance to private companies willing to put up the equity in power generation or distribution facilities. The companies must demonstrate the technical and managerial capacity and experience to construct and operate a power plant of this nature and/or provide electricity service to consumers of various types. Thus, in some instances, joint ventures or management agreements with U.S. or foreign companies will probably be necessary. The loans would be made through foreign banks for the provision of U.S. services as well as commodities.

A special window of this facility would be created as a revolving fund for financing indigenous petroleum and coal resource exploration and development that would be dedicated to private power generation projects. This window would provide matching financing for exploration and development to private Pakistani companies that establish joint ventures with technically competent U.S. companies. If the exploration is successful and development is commercially feasible, the loan will be repaid in full over a 10-year period. If not, the loan is written off. To obtain the loan, the borrower must commit to developing any discovery or deposit for the private power generation if financially justified based on an objective feasibility analysis.

A part of the funding for the facility would include monies to pay for technical review of the proposed projects. The facility itself would be funded initially at \$300 million, of which about \$100 million would be available through the revolving exploration fund window.

E. Project Implementation

The GOP counterpart for the project would be the Ministry of Planning. The Energy Policy Board created to oversee the AID Energy Planning and Development project will coordinate the involvement of the Ministry of Water and Power, Ministry of Petroleum and Natural Resources and other Ministries. One long-term advisor will work with the Ministry of Planning to work on institutional issues and coordinate the short-term consultants. An AID or a host-country technical assistance contract will be concluded for the services of this advisor and short-term technical, financial and legal consultants. WAPDA will create a private sector cell to coordinate relations with potential and actual suppliers to the WAPDA system.

III. Project Design considerations and Issues

A. AID Policy Issues

Promoting the private sector is of course one of AID's four basic means of achieving sound economic growth and development. The Agency has recently given increased attention to "privatization" as a policy objective of AID programs. AID sponsored a major international Conference on Privatization in which the Administrator directed AID missions to pursue opportunities in such areas as electric utility services. A recent memo from the Administrator suggested possible targets in privatization and other policy areas. The ANE Bureau's energy strategy, as it is evolving from the April 1985 Energy Sector Workshop in Los Banos, stresses three basic objectives: (1) rationalization of energy prices; (2) privatization of the energy system; and (3) expanded energy supplies for agriculture and rural industry.

This project would represent perhaps the Agency's largest private sector project and would contribute directly to the above three objectives.

B. Relevant Experience with Similar Projects

The United States, through the Public Utilities Regulatory Policies Act, has led the way in the development of smaller scale generation units tied to the grid. U.S. companies and utilities are thus well placed to provide relevant experience in this sphere. Although the number of private electric utilities in developing countries is still small, the interest and receptivity of governments to this

idea is growing. It is interesting to note that one of the oldest private utilities in the developing world is in the city of Ahmedabad in Gujarat State of India. It is a highly efficient utility of several hundred Megawatts that is interested in new technologies and provision of consulting services to both private and public organizations. AID/New Delhi is working with them in the design of a new project that may involve the introduction of a 30MW fluidized bed combustion system. Several new private sector power projects are under design in developing countries. Bechtel is involved in a large imported coal power plant project in Turkey in which they would put up part of the equity. A&E companies are increasingly seeing that such financial involvement may be critical to their survival, given the drying up of the U.S. market for new power plant construction and the sharp competition from Japanese, Korean, Chinese, and European suppliers.

C. Design Issues

The toughest design issues are at this point seen to be institutional, economic, and financial in nature. The issue of the commitment of the GOP and WAPDA to develop an institutional vehicle through which private investment in power can be promoted is key. The creation of a private sector cell in WAPDA is not sufficient. A body must be created through which the interests of the private sector can be expressed and a comprehensive plan and set of regulations spelled out.

A second major issue relates to the efficiency and cost of generation to be put up by the private sector and whether the costs of service and its quality would increase if WAPDA's distribution functions were turned over to the private sector on either a contract or an ownership basis. While expertise clearly exists in the private sector to operate and maintain diesel generators, the construction and operation of large gas, coal, or even oil plants is beyond the experience of most companies. It is also likely that WAPDA's best engineers will be bid off to the private companies, but this is a situation that WAPDA has had to live with for years from the Middle East. In terms of the basic economics of the proposed plants, it will be important to ensure that some procedure exists to determine whether the proposed ventures fall within a least-cost national power expansion plan. The project design work would refine the estimates of private power generation potential and costs prepared by the Hagler-Bailley/Arthur D. Little team and examine the potential savings from private sector operation of distribution functions.

Since the project will provide loans for U.S. commodities and services, the PID proposes to use foreign U.S. banks as the vehicle for managing these loans. This approach is likely to be an issue for tough negotiation with the GOP. In addition, the issue of providing loans at rates below market interest raises policy issues for AID. It is clear however from the ACE and ECE projects that concessionality is required if U.S. commodities and services are to be attractive to U.S. companies. The declining value of the dollar

and its impact on the competitiveness of certain U.S. goods needs to be analyzed during project design. It is important to be clear that the concept is to leverage equity investment by the private sector as a condition of the loan so that the private sector is able to gain the experience in putting up dedicated generation plants.

D. Co-Financing

The World Bank has informally expressed interest in working with AID in the private sector power generation sphere. They are particularly interested in the potential for private development of the Uch, low-btu gas field, which may be able to support as much as 300MW of gas turbines. Thus, AID and World Bank involvement together would greatly enhance not only the resources potential available for power projects and resource development but also strengthen the policy dialogue.

E. Design Strategy

The design strategy would take into account the work of the previous Hagler-Bailley/Arthur D. Little Team (see the summary recommendations); the active solicitation by the GOP of proposals for investment in Hub Chowki; and the World Bank's interest in co-financing for a project such as the development of the Uch field. The design strategy will be fleshed out during the July donor coordination meeting at the World Bank, at which senior GOP officials are expected also to attend.

F. Illustrative Budget (million U.S. \$)

Component/Source	AID	GOP	IBRD	Private	Total
1. Policy & Planning	5	2	2	1	10
2. Feasibility/Promotion	30	-	-	10	40
3. Energy Finance Facility:					
(a) plant & services	200	50	150	200	600
(b) revolving fund	100	50	50	100	300
4. Contingency	5	5	5	-	15
Total	340	107	307	311	965

H. Initial Environmental Evaluation

The project will involve financing for power plants that could have a major environment impact. Of particular concern is the use of coal or high-sulfur fuel oil. Safety considerations are also of key importance as is the procedure for licensing and inspecting private power facilities. The PP should specifically address these issues and how they will be handled in general and for specific

proposals. Funding for prefeasibility and feasibility studies under component two will require inclusion of basic environmental assessment terms of reference.