WAPDA'S STRATEGIC PLAN FOR THE PRIVATISATION OF THE PAKISTAN POWER SECTOR

Prepared by

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2

TABLE OF CONTENTS

PAGE

Precis i

Executive Summary iii

Privatisation Objectives and Timing iii
The Long-Term Competitive Structure iv
The Transition Plan v
The Implementation Programme vii
Additional Considerations for Government ix
Conclusions x

1. Introduction 1-1

2. Objectives of Privatisation 2-1

A. Enhance Capital Formation for the PPS Outside the GOP Budget and Without Sovereign Guarantees 2-1

B. Improve the Efficiency of the PPS through Competition, Accountability, Managerial Autonomy, and Profit Incentives 2-4

C. Rationalise Prices and Social Subsidies, while Maintaining Certain Socially Desirable Policies such as Rural Electrification and "Lifeline" Rates 2-7

3. Special Considerations in Pakistan 3-1

A. Development and Operation of Multi-Purpose Hydroelectric Facilities 3-1

B. Socially Mandated Subsidies 3-2

C. Fuel Availability 3-3

D. Labor Considerations 3-3

E. Price Protection for Domestic Consumers 3-4

F. Investment Climate and Power Sector Financing 3-5

G. Karachi Electric Supply Corporation (KESC) 3-7

H. Role of the IMF and Multilateral Banks 3-7

4. Long-Term Structure and Operations of the Private Power Sector 4-1

A. Two Models for a Privatised Electricity Sector 4-1

1. The Vertically Integrated Monopoly 4-2
2. The Competitive Wholesale Market 4-4

B. Options for a Privatised Electricity Sector 4-6

C. The Recommended Long-Term Structure of the PPS 4-8

1. A National Transmission/Despatch Entity 4-8
2. Private, Competitive, Largely Unregulated Generation Companies 4-9
3. A Government-Owned Hydroelectric Company 4-9
4. Private, Regulated Distribution Companies 4-10
5. A National Regulatory Authority 4-11

D. The Transition to a Competitive Electricity Market 4-11

Phase I: Unitary WAPDA Monopoy (Preparing the current system for the future)....4-11

Phase II: Decentralisation, Corporatisation and Selected Privatisation 4-12

Phase III: Test and Refinement of Competitive and Regulatory Structures 4-13

Phase IV: Full Operation of the Private, Competitive PPS 4-14

5. National Regulatory Authority 5-1

A. Regulatory Tasks and Objectives 5-1

1. Regulation of Natural Monopoly Functions 5-2
   a. Rate Regulation 5-2
   b. Command and Control 5-5
2. Regulation to Ensure the Coordinated, Reliable, and Adequate Supply of Electric Power 5-5
3. Regulation of the Use of Natural Resources 5-6

B. Structure of National Regulatory Authority 5-7

1. Autonomous 5-7
2. Commission Structure 5-8
3. Technical Staff 5-8
4. Federal Authority 5-9
5. Public Participation 5-9

C. Creation of National Regulatory Authority.... 5-10

6. The Implementation Programme 6-1

Phase I: Initial Planning (Completed by December 1992).... 6-1

Phase II: Initial Privatisation and Detailed Planning (July 1992-July 1994) 6-3

Phase III: System Testing and Finalisation (August 1993-August 1996) 6-6

Phase IV: Full Implementation (1996 onward) 6-7

TABLE OF ACRONYMS

ADB	Asian Development Bank
AEB	Area Electricity Board
BST	Bulk Supply Tariff
ECNSW	Electricity Commission of New South Wales
ECNZ	Electricity Corporation of New Zealand
FY	Fiscal Year
G&T	Generation & Transmission
GDP	Gross Domestic Product
GNP	Gross National Product
GOP	Government of Pakistan
IMF	International Monetary Fund
IRG	International Resources Group
JPC	Jamshoro Power Corporation
KESC	Karachi Electric Supply Corporation
kWh	Kilo Watt Hour
MW	Mega Watt
NRA	National Regulatory Authority
PPS	Pakistan Power Sector
RPI	Retail Price Index
Rs.	Rupees
USAID	United States Agency for International Development
VLL	Value of Lost Load
WAPDA	Water and Power Development Authority

PRECIS

This document offers a Strategic Plan to restructure and privatise the electric power industry in Pakistan. Performed at the behest of the Chairman of the Water and Power Development Authority (WAPDA), it seeks to meet the cornerstone goals of privatisation: providing for the greatest possible role for the private sector and the movement over time towards full competition. These cornerstones have led the Advisory Team to reject the privatisation model provided by Malaysia, where the government has replaced an integrated state-owned electric utility monopoly with a privatised vertically integrated monopoly.

The Plan is structured to meet three critical goals of the government:

A. Enhance Capital Formation for the Pakistan Power Sector (PPS) outside the Government of Pakistan (GOP) Budget and without Sovereign Guarantees;

B. Improve the Efficiency of the PPS through Competition, Accountability, Managerial Autonomy, and Profit Incentives; and

C. Rationalise Prices and Social Subsidies, while Maintaining Certain Socially Desirable Policies such as Rural Electrification and Low Income "Lifeline" Rates.

Under this Plan, the ultimate structure of the power sector will be as follows:

- A number of private generation companies operating under free market competition.
- A government-owned corporatised entity responsible for owning and operating large multi-purpose hydel facilities.
- A national transmission and despatch entity, privately-owned and regulated, responsible for the integrated operation of the electric power sector and a wholesale electricity market.
- Market arrangements allowing final consumers, at least large industrial users, to purchase power directly from generators or power merchants, with the transmission and distribution entities providing transportation and related services in a non-discriminatory manner.
- Private, regulated distribution companies responsible for providing reliable and reasonably priced electric service to ultimate customers, including socially desirable subsidised services, such as rural electrification and "lifeline" rates for financially disadvantaged customers. The GOP will pay these private companies subsidies to provide these otherwise non-economic services. The private companies will have an incentive to control costs.
- An autonomous National Regulatory Authority (NRA), consisting of five Commissioners, a staff drawn from seasoned professionals familiar with electricity issues and, at least initially, external technical advisors funded by an international agency. The NRA will oversee a reorganised WAPDA, the transmission/central despatch entity, the distribution companies and generation companies — until the wholesale power market becomes competitive.

The transformation of the power sector into a privatised, competitive electricity industry will be an evolutionary process occurring over a number of years. This Strategic Plan recommends a transition plan that divides the reform of the power sector into manageable steps that will yield immediate benefits and improve the prospects for long-term success. This transformation can begin immediately with the following initial steps:

- Reorganisation and corporatisation of WAPDA into a holding company with its subsidiaries operating as discrete, autonomous profit centres.
- Privatisation of selected WAPDA units (either its subsidiaries or separate assets) as they become commercially viable, with initial sales (e.g., Jamshoro and all or part of the Faisalabad Area Board) as soon as practical.
- Active solicitation of offers to build new, privately-owned thermal generating plants, selling power to WAPDA under contracts that can later be assigned to privatised distribution companies.
- Design and establishment of a National Regulatory Authority to oversee the evolution of the privatised PPS and to regulate monopolistic services.

Experience from other privatisation efforts provides confidence that the GOP's goals are most likely to be met through the long-term structure and the transition plan for the electric power industry proposed in this Plan. Critical to achievement of the long-term privatisation goals will be the government's commitment to this Plan and perseverance in the face of short-term political and social opposition.

EXECUTIVE SUMMARY

To address the systemic problems of the Pakistan Power Sector (PPS) the Prime Minister in May 1991 directed the Chairman of the Water and Power Development Authority (WAPDA) to launch a bold initiative to privatise the existing power system as rapidly as possible. To assist in implementing this directive, the Chairman of WAPDA retained an international Advisory Team, experienced in electricity privatisation around the world.

The Team, funded by the U.S. Agency for International Development (USAID), was asked to develop a Strategic Plan that will ensure the long-term goal of bringing electricity to all Pakistan's people while introducing private ownership, managerial autonomy, and competition throughout the sector. The Strategic Plan outlines an optimal long-term structure for a privatised PPS, a transition path for moving toward the proposed long-term structure, and a phased implementation programme. The transition plan has been designed so that privatisation and the reorganisation of the PPS can occur in stages that will yield immediate benefits while maintaining the flexibility to make necessary adjustments.[1]

Privatisation Objectives and Timing

Following discussions with senior officials of the Government of Pakistan (GOP) and WAPDA, the Advisory Team believes that Pakistan has the following goals for privatising the electric power sector:

A. Enhance Capital Formation for the PPS outside the GOP Budget and without Sovereign Guarantees;

B. Improve the Efficiency of the PPS through Competition, Accountability, Managerial Autonomy, and Profit Incentives; and

C. Rationalise Prices and Social Subsidies, while Maintaining Certain Socially Desirable Policies such as Rural Electrification and Low Income "Lifeline" Rates.

Privatising a state-owned electric utility is a complex, difficult, and lengthy process that requires political leadership, dedication of resources, and continuity of effort. All of these are present today in Pakistan. Before WAPDA can privatise its assets, however, its activities must be separated into discrete profit centers, which should be established as distinct corporate entities. Only when these entities have operated as distinct businesses long enough to have a commercial track record and have taken steps to enhance their attractiveness to private investors will WAPDA maximise the value of selling these state-owned assets. It is important for the government to realise that worldwide, the transition from a unified, state-owned utility to a decentralised system with significant private ownership and competition has taken four years or more, even where the technical, business, and administrative infrastructure has been relatively sophisticated prior to privatisation. Privatisation in Pakistan must be approached with a realistic view of the difficulty of the job, the time required to do it right, and the vested parochial interests that may oppose government policy.

These obstacles, though formidable, cannot block the dynamics of privatisation occurring around the world. Although the full implementation of a private competitive PPS may take many years, valuable interim achievements will occur along the way.

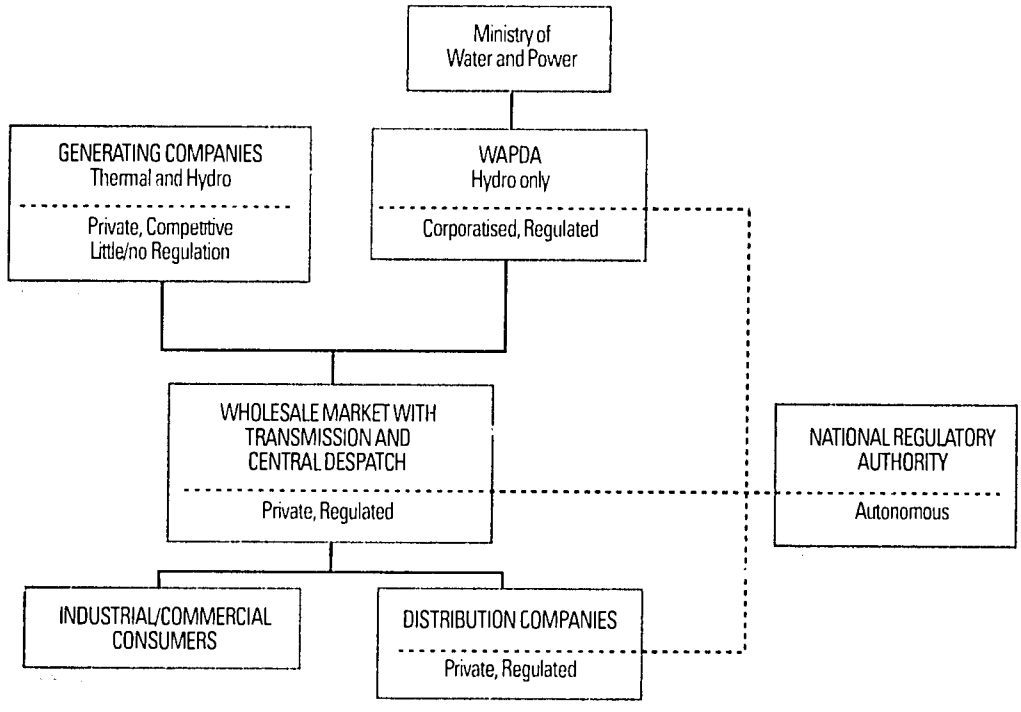
[1] *While the Strategic Plan does not examine the Karachi Electric Supply Company (KESC), the Team advises that the ultimate power sector structure delineated for WAPDA should be considered carefully as a model for the privatisation of KESC. The Team does not believe that privatising KESC as a vertically integrated electric utility will induce competition or be compatible with the future structure of the industry proposed in this Strategic Plan.*

8

The Long-Term Competitive Structure

The Advisory Team recommends that the PPS privatisation programme adopt as a long-term model an electricity sector in which the scope for private ownership and a competitive market process is as large as practical, with the explicit recognition that realising such a model will not be easy and will require a lengthy transition period. Decisions and actions taken during the transition period must not only advance the near-term objectives of privatisation, but must also be consistent with maximum private ownership and competition as delineated by government economic policy. These twin goals — ensuring the broadest possible roles for the private sector and creating competition — have led the Team to propose the long-term structure for the industry discussed below. In recommending this approach the Team examined programs for privatising and increasing competition in the power sectors of other industrialised and developing countries (UK, US, Malaysia, Chile, Thailand, India, New Zealand, Spain and Australia).

Figure 1: Ultimate Power Sector Structure



The principal elements of the proposed long-term model delineated in Figure 1 are the following:

(1) Private, competitive, generally unregulated generation companies responsible for all thermal generation and new mini hydel projects and selling power both to privatised area boards and large industrial users.

(2) One or more government-owned hydel companies, perhaps subsidiaries of WAPDA, responsible for the bulk of the existing hydel projects, and for building and operating any hydel projects desired by the GOP but which are unable to be undertaken by the private sector.

9

(3) A regulated national transmission and despatch entity, initially WAPDA owned, but eventually privately-owned, responsible for the integrated operation of the electric power sector and a wholesale electricity market.

(4) Market arrangements allowing final consumers, at least larger ones, to purchase power directly from generators or power merchants, with the transmission and distribution entities providing transportation and related services in a non-discriminatory manner.

(5) Distribution companies, privately-owned, providing both regulated natural monopoly distribution or "wire" services and retail "supply" services that will be regulated for some customer classes and competitive for (at least) larger industrial customers. Distribution companies will not be permitted to build or own their own generation plants. Distribution companies will provide government mandated and subsidised "lifeline" services and rural electrification utilising direct financial support from the GOP.

(6) An independent National Regulatory Authority (NRA) consisting of five Commissioners and staffed with seasoned professionals. The NRA's responsibilities will be to: maintain competition; control monopoly activities (rates for services provided by the transmission entity and, to the extent competition is not feasible, the distribution companies); ensure reliable and adequate electric services; authorise the utilisation of water resources for private power production; accumulate and distribute information regarding industry performance and market developments; and monitor the provision of GOP subsidised services.

A structure based on this model, when fully implemented over a number of years, will maximise competition among generators and suppliers, thereby allowing market forces, rather than regulators or the state-owned monopoly, to play the major role in investment, operations, and pricing. Of paramount importance, the initial steps taken to move toward this structure will yield immediate benefits while advancing the government's objectives of privatisation, with minimum risk, even if the transition leads ultimately to a different degree of competitive restructuring than is envisioned currently.

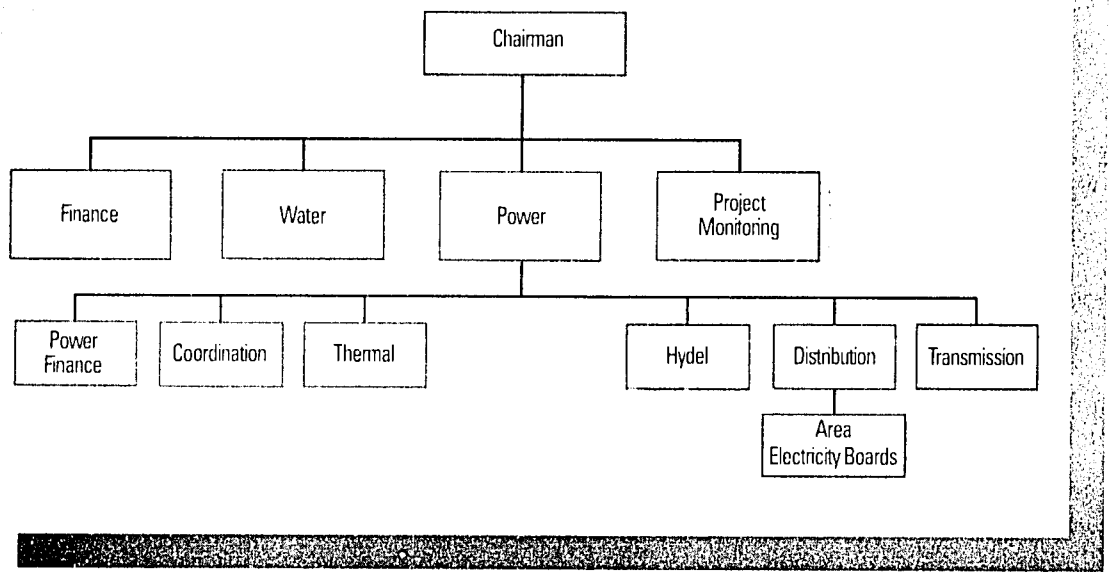
The Transition Plan

During the transition to a private, competitive PPS, difficult decisions and actions must be taken to help meet the nation's pressing power needs. Although the PPS will be evolving during the transition, four phases of the transition process can be defined in terms of the structure and operations prevailing during each phase. As these phases progress, WAPDA will be increasingly decentralised into autonomous units, competitive market mechanisms will be created, regulatory structures will be put in place where and when necessary, the assets and functions of the PPS will be put under private ownership as soon as it becomes commercially possible to do so, and market competition will gradually replace central planning and control.

Phase I: Unitary WAPDA Monopoly (The Current System) (1992)

For a relatively brief period, WAPDA will continue operating as it does now, owning and operating all the generation and recovering its costs through nationally uniform tariffs charged to final consumers. This phase will be primarily one of policy formulation, modest improvements in WAPDA's power solicitation program, and preparation for the privatisation of selected generation and distribution assets. This phase will last through most of 1992.

Figure 2: Current WAPDA Organisation



Phase II: Decentralisation, Corporatisation, and Selected Privatisation (1992-1994)

During this phase, WAPDA's Power Wing will be reorganised into decentralised business/profit centers and corporatised as a holding company (with each separate subsidiary responsible for a distinct business activity); selected thermal facilities (e.g., Jamshoro) and whole or partial Area Electricity Boards (AEBs) (e.g. Faisalabad or Quetta) will be privatised;[2] WAPDA will be prohibited from owning any new thermal generation (although limited GOP involvement in new thermal generation may be necessary as outlined in Chapter 3 if the response from the private sector is inadequate to meet capacity requirements), and all new thermal generation will be purchased through a competitive process, with prices determined by contract and the government becoming more sophisticated and systematic in power solicitation. A simple wholesale market will begin to emerge, allowing power purchases and sales by the independent AEBs and generators. The National Regulatory Authority will be created and staffed. Retail rate reforms will be designed and implemented to eliminate cross-subsidies and establish rates that accurately reflect the costs of providing electric service. This phase will begin in mid-1992 and continue for several years. During this phase significant benefits will accrue to the government as the first stages of corporatisation and privatisation lead to greater market efficiencies and productivity gains.

Phase III: Test and Refinement of Competitive Structure and Operations (1994-1996)

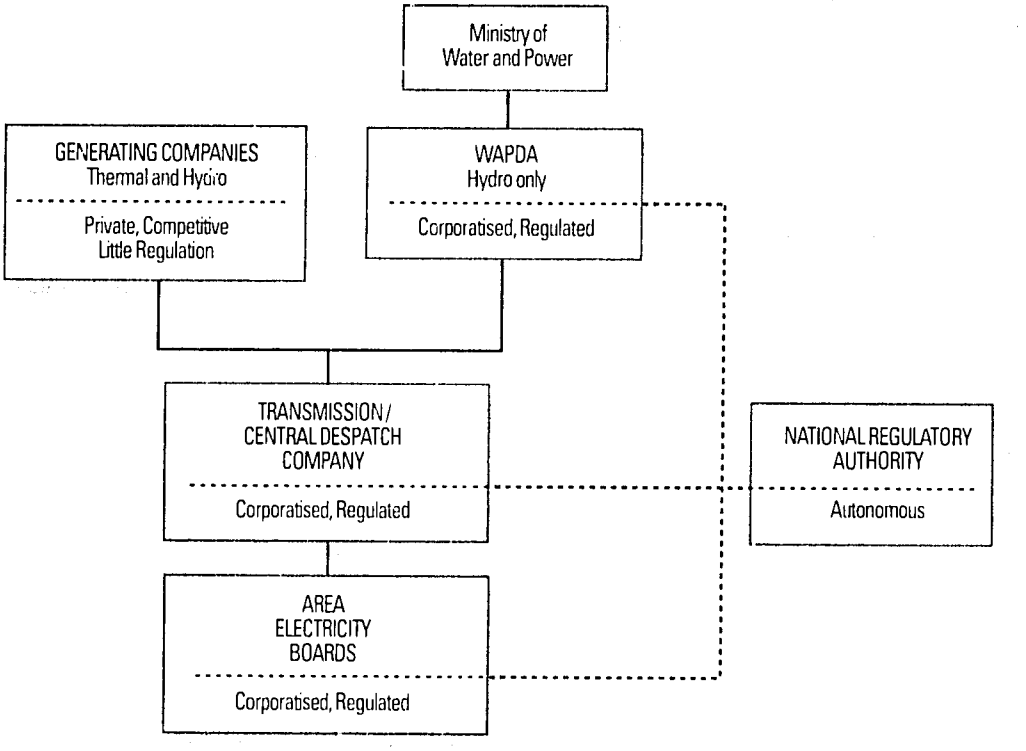
During this phase, WAPDA's core role will be reduced to development and operation of commercially non-viable multi-purpose hydro facilities. While the GOP may continue to forecast energy needs and formulate national energy policy, the private electric power industry will become responsible for meeting the needs of its customers. Management of the transmission system and the despatch/market-making function will be done by a separate, albeit initially government-owned, entity. The independent generation and distribution companies,[3] some privately-owned and some

[2] *The success of privatisation may depend significantly on the success of privatising the first thermal plant. In this regard, WAPDA should (1) take steps outlined by this Strategic Plan in Chapter VI to enhance the attractiveness of the Jamshoro facility, and (2) prepare a second thermal plant for privatisation that is located in a more attractive business environment.*

[3] *The entities providing distribution services are referred to as AEBs and distribution companies throughout this Strategic Plan. The reference to AEBs is maintained as long as the distribution function is performed by WAPDA or a wholly-owned subsidiary of WAPDA. Once privatised, the entities are referred to as distribution companies.*

11

Figure 3: Interim Phase



corporatised, will become responsible for planning for their individual systems and will buy and sell in the wholesale spot and contract markets. The National Regulatory Authority will increasingly define and exercise its authority. The retail rate reforms begun in Phase II will be completed. This phase can begin by 1994 and will take 2-3 years.

Phase IV: Full Operation of the Private, Competitive PPS (1996 onwards)

Eventually, WAPDA and the PPS will be structured and operated as described in the long-term competitive model. Of course, it is possible that the details and even some of the significant features of the long-term model may be modified during the transition period.

The Implementation Programme

Corresponding to each of the phases in the Transition Plan is a dynamic programme of action that must be undertaken to move the PPS from one structural and operational phase to the next. The principal activities in each of these programmes are indicated in Figure 4. The first two of these work programmes are described in detail in Chapter VI. The details of timing and content of the work programmes in later phases will evolve during the transition process itself.

Figure 4: The Implementation Programme

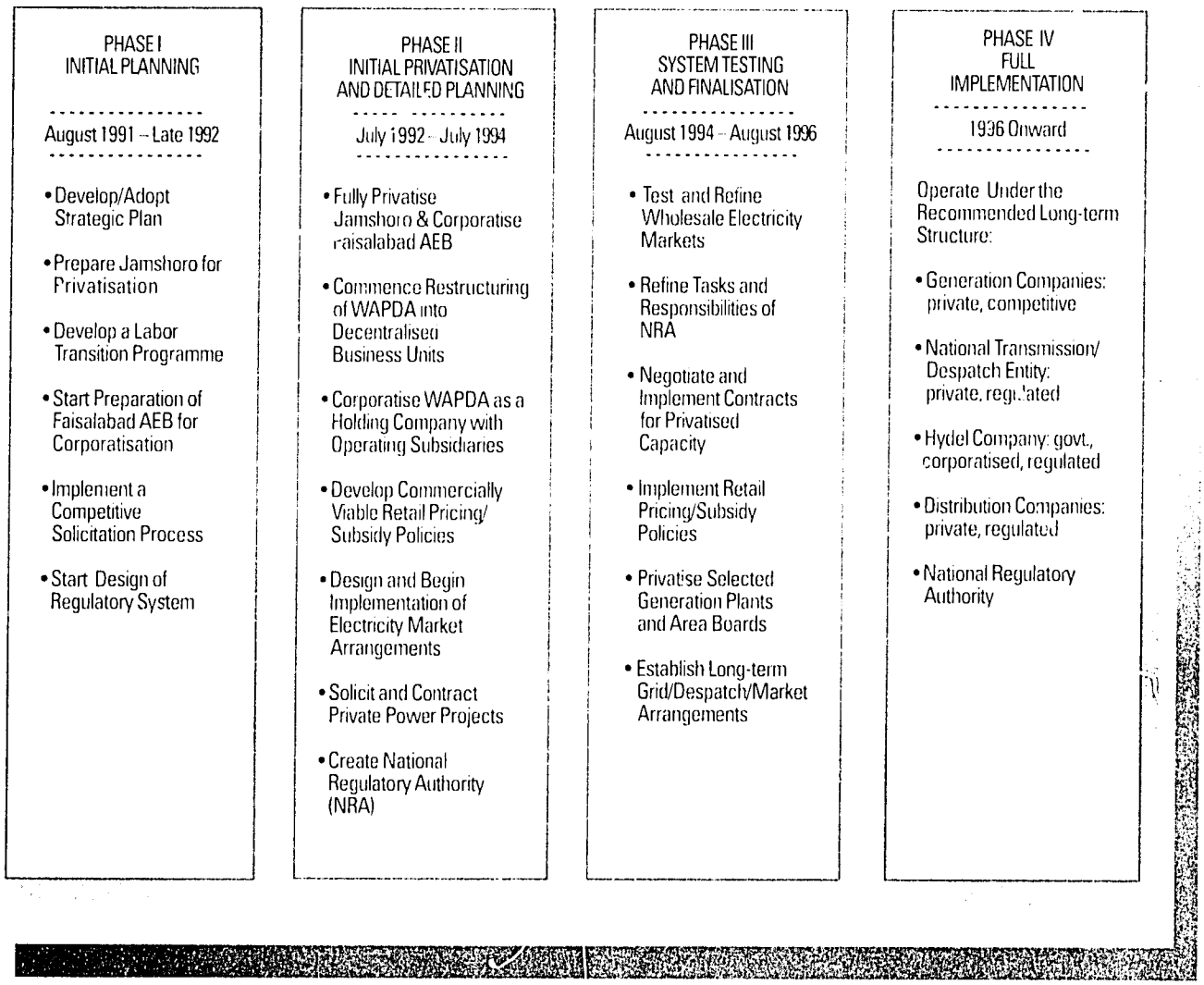


Figure 4 depicts a timeline for many of the actions to be taken in the privatisation programme. Corporatisation and privatisation of existing thermal generating facilities and area boards (other than Jamshoro and Faisalabad) will begin in Phase II.

To initiate the privatisation program, the GOP must take the following actions:

(1) Adopt the "Strategic Plan for the Privatisation of Pakistan's Private Power Sector" and instruct WAPDA to initiate privatisation programme.

(2) Initiate tariff reform and improvements in financial management to eliminate cross-subsidies, reflect cost of service and improve billing collections.

13

(3) Examine GOP borrowing in power sector/Initiate dialogue with financiers.

(4) Initiate privatisation of KESC, consistent with WAPDA privatisation program.

(5) Reform fuel policy to reflect market-based approach.

(6) Enact legislation to:

- Enable WAPDA's Power Wing to be restructured as a corporatised holding company with subsequent dissolution.
- Authorise sale of WAPDA's assets to private sector.
- Prohibit WAPDA and distribution companies from building and owning thermal generation facilities.
- Rationalise/Streamline existing laws applicable to private power sector.
- Create a government fund to subsidise private sector's provision of un-economic services that are socially desirable.
- Create National Regulatory Authority.

With the adoption of the Strategic Plan, which establishes a consensus regarding the goals of the privatisation programme and the GOP strategies, a detailed Implementation Plan will be necessary. This Implementation Plan will detail the steps and delineate the responsibilities needed to execute the Programme set forth in Chapter IV of this Strategic Plan, and should be completed within six months of project initiation.

Additional Considerations for Government

The privatisation process will take many years, as will achievement of all of the objectives. Initially, competition will be limited to contract sales by private generation companies to a monopoly purchaser, WAPDA. Once the PPS is decentralised and the necessary market arrangements are in place, competition to serve larger retail customers will be introduced and, ultimately, expanded to most customer classes. Initially, most of the PPS will remain under government ownership, and private participation will be subject to contract. Over time, regulation will have to be extended to oversee the transmission and distribution "wire" services, maintain the competitiveness of the PPS, and assure that socially mandated, subsidised services are adequately provided.

It may take five to ten years to develop significant competition and experience with the new system. In the interim, private investors may have concerns about the business environment — the integrity of contracts, the stability of regulations, the predictability of tax and labor laws, the continuity of import/export restrictions, etc. — and demand a rate of return high enough to reflect this risk. Such a rate-of-return may be higher than traditionally accepted in Pakistan. It should be possible to address these problems through the provision of guarantees and financial incentives to private investors (possibly with the assistance of international financial agencies through the Private Sector Energy Development Fund). The GOP may need to own new thermal generation as a temporary last resort.

Conclusions

The creation of a largely private and competitive PPS is a realistic and desirable goal that promises to provide significant benefits to Pakistan. This Strategic Plan outlines an ambitious but feasible programme for accomplishing that goal, recognising the need for flexibility and for opportunities to reconsider timing and tactical objectives. Importantly, obtaining many of these benefits is not contingent upon the immediate achievement of the ultimate long-term structure of the PPS. The creation of a more competitive programme for soliciting new generation can be undertaken immediately. This can be followed by a gradual process of reorganising and corporatising the activities of WAPDA, including setting up some of the AEBs and thermal generating stations as autonomous business activities, and taking further steps towards implementing a fully private and competitive power sector.

1

INTRODUCTION

This document offers a Strategic Plan to restructure and privatise the electric power industry (both for WAPDA and KESC) in Pakistan. Performed at the behest of the Chairman of the Water and Power Development Authority (WAPDA), it seeks to meet the cornerstone goals of privatisation: providing for the greatest possible role for the private sector and the movement over time towards full competition.

Pakistan's electric power sector history has been characterised by consistent power supply deficits, massive load shedding, resource constraints, extensive government involvement in finance and management, political interference in the management of the sector, and heavy dependence on weather-dependent hydel power. Practices of the PPS, such as cross-subsidies, flat tariffs, fixed tariffs, multi-purpose hydro schemes, and revenue sharing with provincial governments, complicate these privatisation efforts.

When Pakistan achieved independence in 1947, it had only three hydel power stations. Power supplies in major towns were owned and operated by private entrepreneurs as were isolated power supplies elsewhere in the country. Distribution networks had diverse voltages and frequencies. Electricity tariffs were the sole purview of the private companies and were often quite high. In the decade after independence, demand rose very rapidly, encouraged by the increased availability of cheap hydropower. WAPDA was created in 1958 to implement the Indus Basin Treaty, and to supply the power and water needs of the country.

Rapid growth continued in the 1960s. During the Second Five Year Development Plan (1960-1965), hydroelectric capacity rose from 67 MW to 267 MW, while installed thermal capacity rose from 39 MW to 560 MW. Power generating capacity continued to grow steadily throughout the Third Five Year Plan (1965-1970), although serious blackouts occurred because of delays in building large scale hydel and thermal facilities and because of bottlenecks in the distribution system.

Seasonal variations greatly affect the reliability of hydel power in Pakistan. With rainfall occurring predominantly during the summer monsoon, reservoir levels are low in the spring and early summer. This results in power generation fluctuations of as much as 30%-100% of installed hydel capacity, requiring that hydel facilities be backed up by thermal power. However, the chronic power shortages lead to substantial capacity derating and outages because of the non-availability of any spinning reserves on the system for nearly six months of the year (December-May). High siltation rates of the Indus and its major tributaries also affect the availability of hydel resources, as does the fact that irrigation receives higher priority for scarce water resources than does power generation.

The Fourth Plan (1970-1975) was designed to eliminate or compensate for deficiencies in energy planning and capacity that emerged during the late 1960s. It sought to sustain economic growth by meeting the increasing needs of industry, strengthening social services, and improving the economy of the rural areas through rural electrification.

A major controversy to emerge during the Fourth Plan was whether the expenditure of development funds was properly balanced between building generating capacity and improving transmission and distribution systems to reduce losses. Although redressing this imbalance was a stated objective of the Fourth Plan, this did not occur because funds from international donor agencies were easier to obtain for new generation projects.

The secession of Bangladesh in 1971 and economic dislocations resulting from the OPEC oil price increases in 1973-1974 rendered the Fourth Plan obsolete. These tumultuous events led to a major debate in 1975-1978 about the economic assumptions behind the Fifth Five Year Plan, to be implemented between 1978-1983. The 12 percent annual power supply growth rates projected in the Fifth Five Year Plan were in line with historic annual average electricity growth rates between 1965 and 1977 (11%), but they were inconsistent with the lower growth rates (7%) of 1971-77 resulting from high oil prices.

Many issues of the Fifth Plan were left unaddressed. These included the impact that higher world energy prices would exert on demand, whether capital shortages would hamper the building of new generation facilities, and to what extent reductions in power losses resulting from improvements in the transmission and distribution systems would permit an increase in annual power consumption, even with somewhat lower growth in electrical generation. In addition, the energy/GDP co-efficient contained in the Fifth Plan had little basis in fact, given Pakistan's lower level of economic activity. It reflected the belief held by Pakistan's international donors that less energy could be used per unit of GDP if power losses and theft were curtailed.

WAPDA's policy makers pursued additional generating capacity, as opposed to improving the transmission and distribution systems, because of the greater ease with which financing from international donors could be obtained for showpiece generation projects. Over half the finances for generation projects came from foreign sources, compared to 30 percent for transmission and less than 10 percent for distribution. The government was also unwilling or unable to stop power losses, especially theft, for fear of coming into conflict with established bureaucratic, industrial, and political interests.

Despite the country's diverse energy resources and rapid power capacity expansion during the Fifth Five Year Plan, capacity did not keep up with peak demand, largely owing to the extreme annual and seasonal fluctuations in water supply during much of the Plan. This forced over-reliance on thermal units, including gas turbines, during both peak and intermediate load periods, and reduced normal scheduled downtime for maintenance, resulting in a decline in reliability and an increase in unscheduled outages.

Although the annual load forecast used by WAPDA since 1988 for electricity demand growth during the Seventh (9.8%), Eighth (9.25%) and Ninth (8.2%) Plans has been downgraded by the World Bank (e.g., reduction to 8.8% for Eighth Plan) owing to demand reductions during the first three years of the Seventh Plan, the Government of Pakistan remains financially constrained to cope even with these reduced levels of demand growth.

The Private Power Initiative

At the time of the Sixth Five Year Plan (1984-88), chronic power shortages, projected large annual increases in peak energy demand requirements (8.2% between 1989-1999 and 6.8% between 1999-2009) to support GNP growth of 6-8% per annum, and growing limitations on the GOP to finance investments in power generation facilities, while meeting IMF covenants, led the Government of Pakistan in November 1985 to issue an invitation to the private sector to participate in "build-own-operate" power generation projects. The implementation of the private sector initiative was carried out in association with the World Bank and the United States Agency for International Development (USAID), both of whom assisted the GOP in the formulation of a long-term (20 year) energy strategy including guidelines for the introduction of private sector investment in the power sector.

As a result of the GOP's ambitious private sector programme in the electric power sector under both the Sixth (FY 1984-88) and Seventh (FY 1989-1993) Five Year Plans, a number of private sector projects are moving towards implementation, but at a much slower than anticipated pace. Consequently, in 1989 shortages in peak demand reached 1800 MW, about 30% of demand.

The last two years have been difficult ones for Pakistan. The Persian Gulf crisis led to dramatic oil price increases, supply shortages, plummeting worker remittances, repatriation of Pakistani workers from the Gulf and a loss of export markets to Iraq and Kuwait. Against this background, the new administration of Nawaz Sharif assumed office in November 1990 committed to accelerating the rate of economic and social development, deregulating and privatising the economy, reforming taxation, and expanding industry and employment opportunities, especially in rural and undeveloped areas.

2

OBJECTIVES OF PRIVATISATION

In response to the problems and conditions as described in Chapter 1, in May 1991 the Prime Minister directed the Chairman of the Water and Power Development Authority (WAPDA) to privatise the Pakistan Power Sector (PPS). In moving to privatise the PPS, the GOP has three principal objectives:

A. Enhance Capital Formation for the PPS outside the GOP Budget and without Sovereign Guarantees;

B. Improve the Efficiency of the PPS through Competition, Accountability, Managerial Autonomy, and Profit Incentives; and

C. Rationalise Prices and Social Subsidies, while Maintaining Certain Socially Desirable Policies such as Rural Electrification and Low Income "Lifeline" Rates.

This chapter discusses these objectives and their implications for the desired structure of and transition to a privatised PPS.

A. Enhance Capital Formation for the PPS Outside the GOP Budget and Without Sovereign Guarantees.

The importance of reliable electricity supplies to economic development has led the GOP over the years to allocate the largest share of its development budget to WAPDA's power program. For example, in fiscal year 1989-90, GOP expenditures for the power sector were Rs. 16.4 billion, 28 percent of total GOP development expenditures of Rs. 58 billion and more than the combined expenditures on agriculture, physical planning and housing, education and training, health and nutrition, population planning, social welfare, and manpower. The 1990-91 GOP budget allocates a slightly larger amount (Rs. 16.7 billion) to the power sector.[4]

Thus, mobilising non-GOP sources of financing for the power sector is one of the central objectives of privatisation. However, it is an objective that will be accomplished only in the long run, as private investors gain confidence in Pakistan and its privatised power sector.

Despite this commitment of resources, power shortages continue to plague Pakistan. As reported in "Power In Asia" [December 16, 1991], demand for power as of early 1992 is projected at 8,558 MW – far in excess of the total installed capacity (both WAPDA and KESC) of 6,465 MW. According to the report, WAPDA has had to increase widespread load shedding, at significant cost to the Pakistan economy. A 1988 study conducted by USAID found that load shedding in the industrial sector had reduced Pakistan's annual GDP by 1.8 percent and its foreign exchange earnings by 4.2 percent.[5] To some extent, pricing policies that better reflect the real costs of supply at various times and places can reduce the costs of these scarcities. It will provide stronger financial incentives for voluntary energy conservation and load shedding, and allocation of scarce power in a more efficient manner. However, there is little doubt that increased investment in electric supply will pay significant dividends in terms of Pakistan's economic and social development.

[4] *Government of Pakistan, Finance Division.* Economic Survey 1990-91, *p. 22.*

[5] *U.S.A.I.D. "Power Shortages in Developing Countries: Magnitude, Impacts, Solutions, and the Role of the Private Sector." March 1988.*

Without new sources of private funding, electricity shortages in Pakistan will worsen, since neither the GOP nor developmental lending institutions such as the World Bank and Asian Development Bank (ADB) are able or willing to fund all the new generation required to meet growing demand. The acute financial drain of the power sector on the Pakistan economy has led the World Bank to condition loans to the GOP and WAPDA on WAPDA's ability to provide at least 40 percent of its capital expenditures from internally generated funds. Competing demands for development funds have reduced the concessionary financing that is available for power generation projects.

Private capital can be introduced into the PPS both by selling existing assets to private investors and by inducing private investment in new projects. In either case, the private investment can take a largely passive form involving broad ownership of shares in one or more corporations effectively controlled by hired managers or a more active form in which specific assets are directly managed by owners. The ability of the Government of Pakistan to accomplish its several objectives, including bringing new, private capital into the PPS and into Pakistan, will depend strongly on decisions about what, when, and how to privatise the various parts of the utility sector.

The implications of structure and ownership on the ability of the Government of Pakistan to accomplish its objectives through privatisation are discussed in Chapter IV. In the short run, however, privatisation is unlikely to increase the supply of "reasonably priced" investment funds available to the PPS and to Pakistan on a non-guaranteed, non-concessionary basis significantly above what would otherwise occur. Opening the electricity market to private and/or competitive investors in other countries has shifted financing burdens from the state or regulated utilities to private, non-regulated entities. In the United States, the introduction of competition into the power generation sector has resulted in a large number of new generation projects being built by, and some existing facilities being sold to, private, non-utility generation companies which raise their own financing. The Government of the United Kingdom raised over $6 billion from the sale of state-owned (non-electric-sector) companies between 1979 and 1986, and then in 1990 raised nearly $10 billion through the public sale of shares in newly-created electricity supply companies. In most of these cases, however, raising capital was not a serious problem even after the source of financing changed since the political, legal, regulatory, business, and system operational frameworks were relatively well defined. Private investors could evaluate and have confidence in the deals they were making.

The PPS, whether privatised or not, will be able to raise private, non-guaranteed, non-concessionary financing at "reasonable" cost only when private investors have confidence in the entities and environment in which they are investing. This will require enforceable contracts for power sales and fuel purchases, predictable and fair regulation, and a stable social and political environment. This situation does not now exist in Pakistan. It will take several years of successful experience with a newly privatised PPS before private investors will commit significant funds without expecting rates of return well in excess of those traditionally regarded as acceptable in the power sector. In the meantime, it will be difficult to attract the bulk of investment in the PPS without guarantees by the GOP and/or by organisations such as the World Bank or the Asian Development Bank. Promised rates of return will have to be high enough to attract risk capital, probably initially from Pakistani investors, for whom the perceived risks may be lower than for foreign investors.

In the short run, the GOP can accomplish limited privatisation by putting some easily-separated existing assets into one or more corporate entities and selling them through a broad offering to the public or a trade sale to established companies. Such sales, if carefully crafted, can be valuable initial steps in the transition to a privatised PPS and are recommended as part of this Strategic Plan. For example, successful privatisation of some of WAPDA's existing generation assets will create one or more privately-owned generation companies. Such a step can promote private investment in new

power plants by creating entities in Pakistan that have the incentive, interest, knowledge, and financial capability to develop new power projects. It can also establish a track record for privately-owned power plants in Pakistan, and, thus, promote confidence among potential investors. In addition, the revenue generated from the sale of such assets could potentially be reinvested in the power sector.

However, even such limited sales will require a year or more to effect even for the most easily separated entities (e.g., a single power plant). The short-run value of such sales for the privatisation process comes more from the technical and institutional assets they will bring into the sector than from the new capital they will raise. Further, if existing assets are sold without guarantees from the GOP or international lending institutions, they will have to be sold at a large discount and largely to Pakistani investors. If such sales are guaranteed by the GOP or international lending institutions so that the sales price is higher, they will do little to advance the objective of attracting new, non-guaranteed capital.

This Strategic Plan recommends that private investors be sought to finance, build, own and operate all new thermal generation projects. Again, however, it is likely to be some years before private investors are willing to commit significant funds to new generation projects in Pakistan without guarantees or very high expected rates of return. Indeed, construction risks may make it even more difficult and costly to attract capital for new projects than for the purchase of existing assets. The delays being experienced with the Hab River Project, even when WAPDA is offering an attractive price for the power and guarantees, indicate how difficult it is to attract new, non-guaranteed capital for new generation projects.

Although privatisation is unlikely to make large amounts of new capital available to the PPS and to Pakistan immediately, it may still help ease the problem of generation shortages in the short run by increasing the efficiency with which existing power and capital are used. Scarcities of power and of capital are inherent in every economy; effective economic policy manages scarcity without the unnecessary costs associated with shortages.[6] Increasing the role of market forces in the power sectors of the United States and the United Kingdom has helped ease capital scarcity, not so much by increasing capital availability, but by stimulating efficient investments. In the longer term, this has stimulated investment in gas-fired combined cycle plants rather than massive coal and nuclear plants, and encouraged conservation and load management. Privatisation in Pakistan will improve price signals to consumers and put capacity decisions into the hands of profit-motivated investors. The inherent scarcities of power and of capital will be managed more efficiently, easing Pakistan's capital shortage beyond merely attracting new capital.

In summary, privatisation cannot guarantee that the PPS will have adequate capital to build all the new power plants WAPDA wants to build, or to eliminate power shortages and involuntary load shedding that result from inefficient pricing practices. Nothing can provide such a guarantee, including maintenance of the status quo. In the near-term, a well-managed privatisation process should not make it any harder to raise capital for the PPS,[7] should reduce the costs of power shortages by managing scarcity and the investment of available capital more efficiently, and should improve the prospects for attracting private sector participation. In the long run, successful privatisation of the PPS will increase the willingness of private, particularly foreign, investors to commit their funds to Pakistan on a businesslike, non-guaranteed basis.

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[6] *Scarcity of power (and of capital) is an inherent fact of life, in the sense that no power system has enough capacity (and no economy has enough capital) to meet the demand for power (or capital) that would exist if power (or capital) were given away free. A shortage of power or of capital exists whenever power or capital is underpriced relative to its true scarcity value, so that consumers want more than is available at that price. Thus, by definition, if generation shortages compel WAPDA to curtail power deliveries to customers who want more power at the prevailing prices, WAPDA is underpricing the power relative to its true scarcity value. There are many social, political and technical reasons why WAPDA underprices power in this way. But as long as WAPDA's pricing policies are as inefficient as they appear to be, it is unrealistic and uneconomic to try to finance enough capacity to eliminate shortages.*

[7] *It must be noted, however, that international institutions may be less willing or even unable to lend to private firms as opposed to governments. Such policies provide a strong disincentive for governments to undertake the very privatisation actions that the lending institutions are trying to encourage. This issue must be addressed with the lenders in the early phases of the transition to a privatised PPS, to assure that privatisation of the PPS does not reduce Pakistan's access to development financing in total.*

B. Improve the Efficiency of the PPS through Competition, Accountability, Managerial Autonomy, and Profit Incentives.

The WAPDA management and staff contain many competent, professional, and dedicated people. However, the institutional structure of WAPDA limits management autonomy, tolerates inefficiency and insufficiently rewards initiative and performance. As a result, WAPDA is widely criticised for overstaffing, inadequate maintenance and system upgrades, high theft losses, poor collection of accounts receivables, failure to make economical investments in system improvements, and other problems. Although internal management changes within WAPDA as currently structured can address these problems, lasting improvements will require the creation of independent, competitive business units in which management has the autonomy and the incentives to make the required changes permanent.

WAPDA has one of the highest staff-to-customer ratios of any electricity authority in the world, with one Power Wing employee for every 56 customers (128,500 people serving approximately 7.26 million customers), compared to the staff-to-customer ratios of 1:429 in Japan and 1:93 in Malaysia. Although differences in technical, geographic, and economic factors, make comparisons among different electric systems difficult, such comparisons, nonetheless, are instructive. While WAPDA's energy losses of 20.9 percent in 1990-91 compare unfavorably to 13.9 percent in Thailand, 14.1 percent in China, 15.9 percent in Sri Lanka, and 8 percent in the United States, there are structural characteristics of the system which explain some of the difference. WAPDA, with its northern hydel plants, southern population centres and largely rural and village population, has a relatively transmission-intensive and low-population-density system in comparison to these other countries. Nevertheless, there is plenty of room for improvement.

Evidence of inefficiency exists in WAPDA's business and operational activities. The Area Electricity Boards (AEBs) have significant outstanding accounts receivable on their books, in the form of electricity payment arrears. For the eight AEBs, the total arrears amount to Rs.3.6 billion as of June 1989 (latest available figures); of that total, over 41 percent had aged more than one year and 17 percent were older than three years. One of the AEBs, Quetta, had total arrears that exceeded its total assessment of electricity charges for the year 1988-89.

However large operational and business inefficiencies may be, they are dwarfed by inefficiencies in capacity planning and investment. State-owned electricity systems tend to emphasise too much of the wrong kind of investment, at high cost to their consumers or taxpayers. Although the PPS can hardly be said to be over investing, WAPDA may be choosing inappropriate investments. For example, WAPDA relies heavily on large, capital-intensive hydel facilities despite the scarcity of capital in Pakistan, is promoting the use of imported oil at Hab River over imported coal or domestic fuels, and is postponing transmission investments that are said to be highly cost-effective. A privatised PPS, operating within the harsh light of competition, will make different decisions saving significant costs for Pakistan.

A state-owned WAPDA can, with cooperation from the political leadership, make the changes necessary to solve the problems outlined above. However, in practice it is often impossible to make such changes permanent in a state-owned enterprise. As an example, the AEBs recently reorganised to decentralise distribution operations and give greater controls to provincial governments over utilities serving their jurisdictions. However, many of the decisions continue to be made at the headquarters level. In staffing, the General Manager Administration (Distribution) at HQ is responsible for recruiting Grade 17 officers for the AEBs. Selection of officers at Grade 18 and above is made by a Career Management Cell, which reports directly to the Managing Director

Administration at WAPDA headquarters. Promotion is based primarily on seniority, and skills or specialised training are of secondary importance.[8] Even if the provincial governments gain increased control over the decisions of their local AEBs, local political control of what should be business decisions is no guarantee that these decisions will become more efficient.

As long as assets are owned by the state, management will be subject to political interference because there is no owner other than the state to monitor and control management. Investment decisions will be subject to governmental budgetary priorities, staffing and fuel decisions will be influenced by broader political concerns rather than profitability, and there will be no simple criterion by which to judge and reward management performance. Even if the current political leadership allows the enterprise to make changes, the next government might reverse them, particularly if they are disruptive and painful in the short run. In short, assets that are not actually in the hands of private owners who have a direct interest in their long-run profitability will not be efficiently used, maintained, and expanded in the long run.

Profit-motivated ownership of electricity supply assets, even without real competition, can improve the efficiency of the PPS, since even a monopolist has an incentive to reduce the cost of providing its services to increase its profits. Privately-owned utilities in the United States, which have not historically faced the discipline of competition, have strived to improve productivity to maximise returns to shareholders. Also, the Electricity Corporation of New Zealand (ECNZ), while still a state-owned monopoly, has been given clear directions, incentives and autonomy to improve profits without raising prices. As a result, ECNZ has made dramatic reductions in its costs by reducing staff, contracting out many of its activities, entering into innovative contracts with customers, and decentralising operations under managers with clear performance measures and incentives to meet them. This has been accomplished without competition in electricity supply, although ECNZ has significant competition from gas and other electricity substitutes, and has created internal competition among profit centres. However, ECNZ is confronting increasing political pressure on its operations and pricing, and is moving to create a competitive electricity market as an alternative to direct state ownership or heavy regulation of a monopoly.

Although the profit motive alone can do much to improve efficiency, a privately-owned company that is sheltered from competition has reduced incentives to control costs. Regulation can provide some pressure for a monopolist to improve efficiency, but only imperfectly and only by creating additional bureaucracy and other sources of inefficiency in the system. For maximum efficiency, privatised entities in the PPS must be under real competitive pressure from other profit-motivated entities. As far as practical, privatisation should be accompanied by the creation of open and free competition.

Even before there is real market competition in the PPS, WAPDA should organise itself into discrete profit centres that make sense as business units. Under such corporatisation, each profit centre would be responsible for raising and using resources optimally, and managers would become accountable for their decisions, as measured by profitability of their business units in comparison to other units. Such competitive decentralisation is common in large private corporations.

Corporatisation will be difficult, requiring the creation of sensible business units with individual balance sheets and income statements, and the development of internal markets or transfer prices to determine the value of the goods and services that move between the various profit centres. Such a decentralised system will improve WAPDA's internal management even while WAPDA remains a monopoly. After corporatisation of its business units, WAPDA itself should be corporatised as a holding company, with the business units becoming subsidiaries. This will enhance corporate independence and managerial autonomy, and subsequent privatisation will be facilitated.

[8] *PEAT. "Decentralization And Privatisation of The WAPDA Power Distribution Wing." May 1991.*

Generation plants will be the easiest parts of WAPDA to corporatise, because a generating plant is a relatively well defined entity that delivers a well defined product. One difficulty will be the development of sophisticated contract terms and prices to measure the value of the power delivered to the system.

Defining profit centres at the distribution level will be more difficult. The actual division of assets between distribution and transmission has to be decided. Several studies have suggested putting 132 and larger kV lines into the transmission company, but this has not been firmly decided. Other questions need answers, such as where to draw the line between transmission and distribution at the substation level.

Further, the GOP and WAPDA need to decide whether the AEBs should become a single profit centre, be separated into several profit centres, or be combined into multi-AEB profit centres. Some AEBs or parts of AEBs may be so commercially nonviable that they should remain temporarily as cost centres attached to WAPDA. Even though doing so may result in losses, keeping nonviable AEBs within WAPDA as separate business units will allow the establishment of specific objectives and will make the needed subsidies explicit. Ultimately, privatising these nonviable AEBs, with the government making direct subsidy payments, is preferable to keeping them government-owned. This Strategic Plan recommends such privatisation because profit incentives will encourage the most efficient provision of these subsidised services.

Experience with self-governing, profit-seeking generation and distribution entities in the UK, Australia, New Zealand, Chile and elsewhere indicates that profit incentives, decentralisation, and managerial autonomy, particularly when coupled with competition, will result in a large reduction in the work force, losses, thefts, and accounts receivable in the PPS. Such improvements in operational efficiency do not come without short-term social and political costs, particularly since the largest cost savings typically come from staff reductions in the power and fuel supply sectors. The reductions in work force must be managed carefully, through a variety of mechanisms such as early retirement, attractive severance packages, natural attrition, profit sharing and stock options, etc., but are still likely to create socio-economic tensions and industrial unrest, as occurred at Jamshoro when the privatisation initiative was first announced. It may be necessary to phase in such staff reductions over a period of years; but improving the efficiency of the power sector will improve overall industrial production and employment in the long run and, hence, must not be delayed any longer than absolutely necessary.

Privatisation will not only improve operational efficiency of the power sector but will also improve the efficiency of capacity planning in the long run. If generation investment is required to show an expected profit, capacity planning becomes a fundamentally different process from that in a state-owned utility. Only projects that are timed and sized economically, with economic technologies, fuels, sites, and labor relations, will go forward. Furthermore, distribution companies and large industrial customers asked to sign such contracts will make their own judgements about whether new power supplies are necessary to satisfy their forecasted needs and are economic relative to investments in energy conservation and load management. Investors and consumers putting up their own money, rather than central planners, will decide what is "economic," resulting in scarce economic resources going where they will contribute the most to the economy.

As discussed in Chapter IV, decentralised transactions among independent, profit-seeking entities will produce the most efficient solution only when a relatively sophisticated competitive electricity market is in place. Developing such a competitive market will take years. In the meantime, however, some governmental entity, preferably the National Regulatory Authority (NRA), described in Chapter V, will assure that adequate investment is being undertaken. Nonetheless, in the near-term, the GOP can take significant steps toward a profit-oriented and competitive PPS that will yield significant efficiency gains even before a private, competitive, market-driven PPS is fully established.

C. Rationalise Prices and Social Subsidies, while Maintaining Certain Socially Desirable Policies such as Rural Electrification and "Lifeline" Rates.

The transition from a state-owned enterprise to one or more private entities can be a slow, tedious, and politically difficult process. Unlike their private sector counterparts, state-owned enterprises need to balance their business interests against other pressing governmental, social, and political objectives. For example, the goal in Pakistan of bringing electricity to all the nation's people by the twenty-first century remains a major national priority, despite the fact that extending the distribution network to thousands of small villages is a costly activity that requires large subsidies. Likewise, the GOP remains committed to insuring a base "lifeline" electricity service for the nation's poorest citizens. There are also more or less uniform electricity tariffs for discrete customer classes across the nation. Tariff cross-subsidies currently pay for these policies, whereby industrial, commercial and urban customers are "taxed" through higher-than-average prices to reduce the rates of residential, agricultural, and rural customers.

In a privatised, fully competitive electricity sector, maintaining cross-subsidies will be difficult because the goods and services being "taxed" to pay the subsidies will be at a competitive disadvantage relative to non-taxed goods and services. For example, if urban power sales pay for rural electrification, urban consumers have the incentive to self-generate or, if allowed, purchase power from other sources. Further, industry will have incentives to locate in regions with lower rural electrification cross-subsidies, even if real power costs are higher there. If subsidised sales are to continue, explicit tax-and-subsidy arrangements will be needed to assure that those entities providing subsidised services are compensated and that consumers do not have large incentives or simple means to avoid paying the subsidies.

From a economic standpoint, the best source of funds for subsidising socially desirable services is the GOP budget. Raising the money through general taxes gives power consumers little incentive and opportunity to avoid the tax. Further, the subsidy amount is explicit in the budget, requiring periodic political review of each subsidy and providing pressure to minimise or discontinue them. Of course, this is why politicians favoring such subsidies often prefer to fund them through cross-subsidies in utility rates. Funding of power subsidies through the GOP budget may be politically difficult.

To fund rural electrification and lifeline rates via cross-subsidies within the PPS itself, the required "taxes" must be levied on monopoly services or else the subsidy-paying consumers will be able to switch to other competitors and avoid paying the subsidy. For example, connection charges levied on everybody attached to the transmission grid can fund these subsidies, so that all generators and middlemen attached to the grid are subject to the same tax, and none of them is put at a competitive disadvantage. This will still give a competitive advantage to free-standing self-generators who do not pay the grid charges. However, unless the tax becomes unduly burdensome, few customers will find the non-utility power option attractive.

The need to continue these subsidies and how those subsidies are funded may influence the structure of the PPS or the ultimate rate structure. Direct subsidies to finance nonviable rural electrification or lifeline rates will allow the privatisation of economically viable distribution companies and the development of electricity rates that reflect the cost of providing electric power services. Absent direct subsidies, however, certain customer classes will continue subsidising such services, altering the post-privatisation structure in several ways. First, uniform national tariffs might be needed to assure that the cost of providing "lifeline" services and rural electrification are equal across the nation, rather than imposing a larger "tax" upon consumers who happen to live in poorer regions of the country or the rural areas. Second, maintaining the cross-subsidies may,

unfortunately, require that the distribution entities be combined in a single, integrated, profit-oriented distribution company. This will enable the flow of revenue generated by tariffs to be handled through internal accounts rather than through a complex and contentious system of allocating funds among separate companies.

The GOP and WAPDA will have to solve these questions during a transition period. However, this Strategic Plan recommends that WAPDA take steps to phase out cross-subsidies as quickly as possible and to obtain direct GOP funding for those services that must remain subsidised. Corporatisation and privatisation of the AEBs will be easier if these questions are answered early, on a national basis, rather than requiring individual, corporatised AEBs to deal with them separately. Agricultural subsidies, such as tubewells and fertiliser production, should be phased out within three years. Regional tariffs that reflect production cost should be phased in over three to five years to replace the nationally uniform tariff. The GOP should fund directly the cost of lifeline rates and rural electrification, perhaps with a special tax levied on all power sales in the PPS. These proposed solutions can be modified during the transition if warranted by political or managerial necessity.

3

SPECIAL CONSIDERATIONS IN PAKISTAN

As a developing country, Pakistan has unique characteristics that the privatisation programme must consider. At independence, Pakistan had a small energy resource base; it has been struggling ever since to provide adequate energy to fuel the country's economic development. The country has implemented large-scale multi-purpose hydel schemes to provide irrigation, control floods, and provide power. To ensure that disadvantaged areas and populations are not left behind, various economic development programmes have been implemented, including agricultural subsidies, rural electrification, uniform nation-wide tariffs, and lifeline rates for residential consumers. The government enacted these programmes in recognition that energy is critical not only for economic growth, but also to ensure social equity.

However, many of the ongoing programmes of the GOP cannot coexist within a privatised power sector without sacrificing the efficiency gains of privatisation. Since efficiency is one of the ultimate goals of a privatised power structure, by issuing the directive to privatise Pakistan's power sector, the GOP has committed to halting or modifying many of the programmes that are incompatible with a privatised power sector.

A. Development and Operation of Multi-Purpose Hydroelectric Facilities

Since independence, Pakistan has pursued integrated development of the country's vast water resources out of the belief that improved farming practices — the use of fertilisers, improved seeds, and pesticides — cannot attain the target of food self-sufficiency without assuring sufficient and controlled water supplies for irrigation and eradicating the menace of waterlogging and salinity. Several factors make increasing water resources especially challenging in Pakistan. The land is generally arid or semiarid, and supplies of water are dependent on snow-melt and the adequacy of summer monsoons. Further, the land suffers from poor drainage, waterlogging, and salinity. Problems in the agricultural sector are aggravated by India's curtailment of water supply to Pakistan's vast irrigation system. Of all the rivers that irrigate Punjab and Sind, only the Indus lies outside India's control. Thus, development of the Indus Basin — linking the Indus, Jhelum and Chenab Rivers — has always had both a national security as well as an economic rationale.

In 1991, hydroelectric facilities provided nearly 55% of WAPDA's total generation and continue to serve as vital sources of irrigation and flood control. The multiple importance of hydel facilities is demonstrated by the contribution that hydel profits make to the budgets of the provincial governments under the terms of The Indus Waters Accord of March 21, 1991, and the National Finance Commission's Accord of April 20, 1991. While these accords went a long way in resolving long-standing disagreements between the provinces and the central government over sharing the benefits of hydel resources, the accords raise financial problems for the expansion of electric generating capacity. Under the terms of the accords, WAPDA in FY 1992 will have to pay the provinces nearly six billion rupees ($245 million); WAPDA's payments to the provinces will rise as tariff increases generate higher profits. Such financial obligations will force WAPDA either to raise tariffs or to increase borrowing from the government or the credit markets. If WAPDA borrows the money from the government, this will have a deleterious effect on the government's budget, since WAPDA's borrowing is considered a government obligation by the World Bank and the IMF.

From a policy perspective, the critical issues for the government are how to meet its obligations to the provinces, revise electricity tariffs to the degree possible so that they reflect the long-run marginal costs of production, and generate the investment capital needed to finance new generation in the hydel sector. One solution may be to change the method of calculating the provincial royalty payment, since failure to do so will create burgeoning financial demands on WAPDA.

Other factors also need consideration. Because most of the existing hydel plants are primarily designed for irrigation with power production a byproduct, the timing and volumes of water releases are determined by irrigation requirements, not electricity needs. Further, WAPDA has plans to build additional large-scale hydro projects (Kalabagh, Ghazi Ghariala, Basha, etc.) which will require large lead times and sizeable capital requirements.

For these reasons, the Advisory Team recommends that the GOP (1) leave existing large hydro facilities in the control of WAPDA, which will operate the facilities for the benefit of all the distribution companies; (2) create a GOP entity, preferably the National Regulatory Authority (NRA), responsible for issuing licenses for private sector development of hydel projects that produce primarily, or solely, electricity; and (3) make WAPDA or some successor government entity responsible for the development of "multi-purpose" hydel projects that are in the national interest, but which the private sector is unable or unwilling to support.

B. Socially Mandated Subsidies

Rural Electrification and Agricultural Cross-subsidies

For the foreseeable future, the continuation of rural electrification will remain a top priority of the GOP. Because the cost of extending grid electricity or the provision of stand alone generation facilities to these areas often cannot be recovered through electricity rates, and owing to the lack of sufficient load factors, this commitment to provide electricity necessitates subsidies or direct transfer payments by the government.

As discussed in Chapter II, the current tariff system of cross-subsidies to pay for these otherwise unrecoverable costs must be reformed. To the extent that subsidies are needed, the GOP should make them transparent by financing them directly, instead of hiding them in electricity tariffs. Recent efforts to fund WAPDA's rural electrification activities directly through government payments rather than through WAPDA's tariffs is a step in the right direction.

Ideally, private transmission and distribution companies will ultimately carry out rural electrification programs with the government directly providing the incentives to make doing so attractive. Failure to eliminate cross-subsidies in WAPDA's tariff structure will make private sector investors unwilling to invest in new electric generation projects to supply regions of the country that enjoy the large subsidies unless the government covers that portion of their costs not recovered from the sale of electricity. Further, aspects of the current tariff system (e.g., flat tariffs) discourage investment in energy conservation and end use efficiency. In addition, need should determine subsidies; they should not be extended to individuals or companies who have the ability to pay.

Since a goal of privatisation is to base electricity prices on the cost of supplying services to the consumer, reform of the tariff system must occur. Some point to the Polish example of "shock therapy," whereby prices are decontrolled quickly. However, the unique circumstances of Pakistan mandate a more cautious, phased-in approach. The GOP should remove all existing cross-subsidies over three years; 25 percent in year one, 35 percent in year two, and 40 percent in year three. To insure that these changes are effected on a timely basis and are not subject to political reversal, the

National Regulatory Authority will oversee implementation in consultation with the World Bank. This will insure that the economic development of the country is not impaired during the transition process. Whatever the strategy for tariff reform, "lifeline" electricity service, directly reimbursed by the GOP, will have to be provided for the poorest portion of the populace for the foreseeable future.

With privatisation and the phased removal of most tariff subsidies, rate differentials will emerge across the country reflecting the variable costs in providing electric power service. This in turn may lead some industries to set up operations in areas enjoying the lowest tariffs. The possibility of industrial and commercial customers relocating to take advantage of these tariff differentials creates a powerful incentive for each distribution company to operate as efficiently as possible. Finally, if, in response to rate variations, industries make location decisions that are contrary to national economic development policy, the government must not backslide and re-institute a uniform tariff policy or, in other ways, attempt to use electricity pricing as a tool for achieving social policy goals. Instead, the government should use fiscal policy, rather than tariffs, to attract industries to the more remote rural and tribal areas.

C. Fuel Availability

WAPDA operates its thermal stations with natural gas, diesel fuel, furnace oil, and coal. Following privatisation, WAPDA or the GOP will no longer make fuel choice decisions. Power plant developers will assess the risks associated with particular fuels and select wholesale power suppliers consistent with desired generation and fuel portfolios. Furthermore, although the government, through the regulatory or licensing process, may wish to provide broad policy guidelines on fuel choice, it is inappropriate for the government to mandate the choice of fuel.

Consequently, as part of the electricity privatisation process, the GOP should examine how national energy policy for primary fuels may impact on the fuel choices of electricity generators. For example, power purchasers and power project developers may prefer using natural gas in new combined cycle plants owing to the high operating efficiencies, lower capital cost, and shorter construction schedules. However, continued regulation by the GOP of natural gas prices at the wellhead, combined with restrictions on the use of high btu gas for the power sector, may make private sector investors unable to build such plants since they will not be able to sign long-term (15 years) contracts with natural gas producers. This will be detrimental to the evolution of the PPS, as well as to the development of Pakistan's energy resources.

Following privatisation, continued price controls on any fuel will create distortions in the marketplace. Consequently rapid decontrol of fuel prices is essential. To the degree that subsidies are needed for poorer consumers, they should be financed directly in the GOP national budget.

D. Labor Considerations

One of the most difficult issues during any privatisation process is defining the rights of the new owners and operators to modify staffing to improve efficiency. This is especially so in Pakistan, where employment levels reflect social policy more than they reflect the efficient use of relatively low cost labor.

To achieve the benefits of privatisation, it is absolutely essential that the government not encumber the private sector with restrictive rules and regulations that prevent the new owners and operators from efficiently managing their business. At the same time, though, for privatisation to be successful, a transitional period will be required to manage labor dislocations.

With privatisation, the compensation of the employees retained by the private sector generally rise to levels comparable to those of other private enterprises. WAPDA has many highly skilled and knowledgeable professionals that will remain with the newly privatised companies under new compensation arrangements; others will seek positions with the private sector. However, the overall staffing levels of the privatised entity often are reduced dramatically. Indeed, rationalisation of the use of labor and reductions in work force are two of the most important efficiency improvements to be achieved by privatisation.

Further, if employment rules imposed by the government as conditions of the sale are too onerous and affect profitability, it will have a negative impact on both the price private investors will be willing to pay and on their willingness to invest at all. This may be relevant only for the electric generating assets, which will face competition quickly. The distribution businesses, where the majority of existing WAPDA employees work and which, after being privatised, will be regulated monopolies, could support existing staff levels as long as they are assured of rates that cover the "excess" operating costs. Under such conditions, there would not necessarily be any significant market price penalty. However, long-term efforts to protect labor from disruptions frustrate the purposes of privatisation and should be avoided.

Nevertheless, uncertainty among workers about the security of their jobs during privatisation must be addressed. At this point, the Strategic Plan simply identifies a range of strategies that should be evaluated in greater detail. These options include:

- Implementation of attractive early retirement programmes, coupled with a hiring freeze within WAPDA, except for the Water Wing;
- Providing assurance that any WAPDA employees that are not transferred to the private sector will continue to be employed by WAPDA for some defined period of time;
- Reserving some ownership shares of the privatised WAPDA facilities, or some participation in the privatisation proceeds, for WAPDA employees;
- Limiting annual staff reductions for employees transferred to the private sector to natural attrition plus five percent of existing staff; and
- Providing redundant staff with free outplacement counseling services that may include retraining.

The Strategic Plan recommends that the GOP and WAPDA develop a Labor Transition Plan that will allow the privatisation of the power sector to occur in a manner that provides adequate management flexibility to the private sector while addressing the concerns of labor. This task should begin immediately, allowing for early education of WAPDA's employees about the purpose and effects of privatisation. Further, the government has established legislation on labor issues that private sector investors must honour when purchasing facilities. These should be reexamined since the government can enact policies designed to help labor effect a transition from a government-controlled monopoly to a privatised, competitive industry. For example, Malaysia offered existing employees of the to-be-privatised electric utility the option of retaining a government position at a fixed rate or moving to the privatised corporation with the opportunity to earn much greater compensation, albeit with employment risk; workers overwhelmingly chose the latter option.

E. Price Protection For Domestic Consumers

Any move towards privatisation of the PPS must occur in tandem with creation of a strong national independent regulatory authority with full jurisdiction over tariff policy (see Chapter V). The members of this regulatory agency, the NRA, should be free from governmental pressures. The

NRA will: (a) regulate rates for electric service that are not subject to competitive discipline, that is, transmission and distribution "wire" service, power sales to retail customers if the distribution companies have exclusive service franchises, and power pooling/marketing arrangements; (b) foster and preserve the competitive structure of the electric power industry; and (c) ensure the coordinated, reliable and adequate supply of power.

Because of the potential pitfalls involved in any privatisation process, the Advisory Team recommends a cautious approach in designing and creating a national regulatory authority. Too much regulation, while intended to protect the public interest, can dramatically inhibit the creation of a competitive PPS; regulation that is too lax can foster predatory pricing and reliability problems.

For these reasons, the Advisory Team, as outlined in detail in Chapters V and VI, recommends a phased approach to implementation of the National Regulatory Authority. For example, during the privatisation of thermal generation, the regulatory authority must ensure that WAPDA does not use its market power to prevent fledgling generation companies from competing in the marketplace. Also, wholesale power sales should remain regulated until the NRA concludes that the wholesale market is competitive. However, as five or six companies emerge, regulatory oversight may become less intrusive as market forces become robust. Similarly, until an independent transmission authority is established, the NRA will have to keep a watchful eye on whoever operates the grid in the interim to ensure that control of the grid does not prevent privatised generation companies from effectively competing in the market. Once free access to the grid becomes a well established policy, the NRA can reduce the intensity of its regulatory oversight.

The NRA will also be responsible for protecting retail customers from monopolistic abuses and inefficient management of the distribution companies. This can be achieved by having the NRA focus on the distribution companies' electricity procurement costs.

In conclusion, the Advisory Team recommends an evolutionary approach to regulation to allow Pakistan to become acquainted with the nature of a regulatory regime and how it can best protect the legitimate interests of energy producers, providers of electricity services, and energy consumers. Nevertheless, with the creation of an NRA, business in the power sector will never be the same. WAPDA and its corporatised constituent parts will no longer have autonomous decision making power. Over time, this will encourage greater efficiency and more price transparency.

F. Investment Climate and Power Sector Finarıcing

One of the principal objectives of privatisation is to attract private investment into the power sector. One major concern in the electricity privatisation programme is the limited capitalisation of Pakistan's capital market, about $3 billion in 1990. Also, large scale investments in WAPDA's existing thermal generation and distribution assets will limit the capital available to support new power generation. Thus, a phased-in approach to privatisation is recommended, spearheaded by the sale of one major generation facility, Jamshoro, and one area board, Faisalabad. Once these facilities are sold and the reactions of domestic and international investors are assessed, a more refined blueprint for the rest of the privatisation process can be created.

There is no doubt that the limited size of the Pakistani capital market mandates the need for major international private sector investment to make the privatisation process a success. Since 1985, the Pakistan capital market has grown as follows:

	1985	1986	1987	1988	1989	1990
US$mil	1,370	1,710	1,960	2,460	2,457	2,985
% Change		24.8%	14.6%	25.5%	(.001%)	21.5%

One fact alone demonstrates the concern regarding the absorptive capacity of Pakistan's domestic capital market: only one company listed on the stock exchange has a value exceeding $250 million, which is less than the book value of many large thermal plants.

The international financial marketplace therefore represents the most likely source of funds for sale of existing thermal plants and the development of new generating facilities. The willingness of foreign investors to participate aggressively in generating facilities in Pakistan will depend primarily on the perceived balance between the investment risk and the potential financial return in Pakistan as compared to opportunities in other countries. Nevertheless, sale of existing facilities to foreign investors, while feasible, may encounter political opposition.

Pakistan is competing for capital investments with countries that have gone much further in attracting investors. Even among developing countries, Pakistan is competing for scarce capital with countries, e.g. Malaysia, Thailand, Chile, Mexico, which have over time proved their attractiveness as investment havens. Attracting private investment in the power sector requires actions on other fronts as well, since investment decisions are made on the basis of more than just one sector variables.

Investors must be able to perceive a level of financial return commensurate with the risks involved in an investment. Without some historical track record giving confidence that long-term investments will earn the appropriate returns, investors are likely to insist either on assurances or on the opportunity to earn returns that may be viewed by the GOP as unacceptably high. Consistent with a privatisation programme, the GOP will have to rely on the market for information such as financial rates of return, cost of capital, perceived risk, and the investment climate.

Currently, new generating capacity being developed by private interests, such as the Hab River project, are receiving such substantial GOP and World Bank guarantees and underwritings that they do not represent good examples of private investment. Until the political and economic environment is attractive, there will not likely be significant expansion of the capital available to purchase existing or build generating capacity, even under a privatised structure, without government guarantees.

The Pakistan government has taken substantial steps to restructure the economy to attract foreign investment. However, major obstacles remain, including: Pakistan's image as a country with unstable governments, the ever present security threat vis-a-vis India, tensions between the federal and provincial governments, overwhelming government involvement in business, and nascent capital markets. Moreover, international investors will want to evaluate the sincerity of the government's efforts to liberalise the economy before they make concrete investment decisions. There is also anecdotal evidence of large-scale Pakistani capital flight; a prime indication of long-term stability will be the government's ability to attract this capital back to Pakistan.

Once the Pakistan investment climate becomes attractive to internationally mobile capital, there will be no capital shortage for the PPS: Pakistan's investment needs are small compared to the size of the international capital market. However, private sources of finance for new electric generation without sovereign guarantees are not likely to emerge quickly on a large scale. As a result, the GOP may have to remain involved, at least temporarily, in the acquisition of capacity. Any continuing involvement of the GOP in generation must be carefully defined and limited to the minimum

necessary to solve the problems of attracting capital into the power sector. As a first step, the GOP should offer guarantees and financial incentives to induce private investors to build, own and operate thermal plants. If this is inadequate, the GOP could contract directly to purchase power from a privately financed project, planning to sell the resulting power to a buyer in PPS. As a last resort, the GOP could own a new project built under a turnkey contract with a private developer, and then sell the plant to private investors.

This Strategic Plan recommends that the NRA be authorised to extend sovereign guarantees and other financial incentives to private investors. For example, if WAPDA or, eventually, the distribution companies are unable to arrange for new generation without financial incentives, such as sovereign guarantees and tax holidays, they could apply to the NRA to have such benefits extended to particular developers. The practice of extending guarantees and other financial benefits should not continue indefinitely, and should cease once privately-owned power projects in Pakistan have proven viability.

Most importantly, GOP support should only be secured as a last resort. To curb undue reliance on the GOP, WAPDA and the distribution companies should be assessed a fee for the benefits the GOP extends to developers. This fee should reflect the cost to the GOP of providing such benefits.

Finally, the ultimate protection against capacity shortfalls under a privatised PPS is continued construction of government-owned power plants using concessionary financing. This alternative is the least attractive option and could result in the creation of a government entity with a vested interest fundamentally inconsistent with the goals of privatisation.

To protect against this possibility, the Strategic Plan recommends that construction of government-owned power plants requires the approval of the NRA. NRA review will ensure that such projects are consistent with the interests of consumers. NRA approval should only be obtained after the NRA has reviewed the results of formal solicitation programs and concluded that new generation is needed, that the private sector cannot provide such capacity, and that there are no other actions that the GOP can take to encourage private investment in new generation. Finally, to protect against the rebirth of a publicly-owned utility, government-owned power plants should be built, operated, and maintained by the private sector and privatised as soon after commercial operation as possible.

G. Karachi Electric Supply Corporation (KESC)

KESC is a vertically integrated utility that generates, transmits, and distributes electricity to the Karachi area. KESC is already a partially "privatised" utility, with 7% of its shares listed on the stock exchange. Although the consultants' scope of work on developing the Strategic Plan did not include KESC, the recommendations under this Plan should equally apply to KESC. As pointed out in Chapter IV, the existence of a vertically integrated KESC will be an anachronism within the private, competitive power structure recommended under this Plan. Indeed, the continued existence of a vertically integrated utility that is able to shelter itself from the discipline of competition through its control of transmission could frustrate many of the GOP's privatisation objectives.

H. Role of the IMF and Multilateral Banks

Multilateral agencies, such as the World Bank and the Asian Development Bank (ADB), have been substantial partners in Pakistan's power sector development. Consequently, these institutions have a large exposure in the country, and must be consulted during the privatisation process. Important questions include: will the private entities take up part of the loan portfolio?; will the Banks agree to

a transfer of loan payment provisions to the private sector?; for soft loans, will the Banks allow the private sector the same terms and conditions?; how will the Banks treat the possibility of default by the private sector?; and will future loans be made direct to the private sector or only through the government?

These multilateral Banks, besides being a source of financing, have extensive experience with utility privatisations. As an example, the World Bank and the ADB are heavily involved in the effort to corporatise and privatise Malaysia's utility. So far, the utility has already been corporatised, with 25 percent of its stock to be issued in 1992. Similarly, the Asian Development Bank is examining power sector privatisation options in Laos and is providing technical assistance to KESC. The GOP should create a mechanism whereby the Banks are regularly consulted during the privatisation process. Furthermore, both the World Bank and the ADB have extensive experience in regulation which can be utilised to provide valuable technical assistance to the National Regulatory Authority during its infancy. In addition to providing technical assistance, international donor institutions can reinforce privatisation efforts by limiting their financing of new thermal generation to funding provided through the Private Sector Energy Development Fund, rather than providing financing to government institutions or WAPDA.

With the acceptance of this Strategic Plan, the GOP will have to analyse the options and formulate solutions to specific concerns. These multilateral banks could be a valuable source of funding and expertise for carrying out some of these analyses. Some topics that need further examination include:

- Rural electrification: agencies and responsibilities, financing, scope, tariffs, subsidies;
- Tariff structure: setting up rate structures that (1) reform nationally uniform tariffs to reflect the cost of providing service to nationally defined customer classes, (2) permit incremental deviation from national tariffs so that rates reflect the cost of service of individual AEB's, (3) minimise cross-subsidisation, and (4) provide "life-line" services;
- Personnel issues: achieving the goals of privatisation while satisfying labor concerns, determining the role of labor in the new private power structure, conducting negotiations with the labor unions;
- Karachi Electric Supply Corporation: its role in the new structure, optimal method of privatising KESC;
- Geographic configuration of AEBs;
- Reform of fuel policy; and
- Hydel issues: investments, asset valuation, profit definition, and pricing.

4

LONG-TERM STRUCTURE AND OPERATIONS OF THE PRIVATE POWER SECTOR

This chapter discusses the options available for the long-term structure of the PPS, recommends a structure that best meets the GOP's objectives outlined in Chapter 2, and lays out a transition path for moving toward the desired structure given the characteristics of the PPS and of Pakistan outlined in Chapter 3. It identifies actions that will yield near-term benefits and will move toward the desired long-term goals, while minimising risks associated with privatisation and maintaining the flexibility to make the adjustments in objectives and timing that are necessary.

As outlined in Chapter 2, the GOP has several objectives in privatisation, most notably capital formation and improved efficiency through the introduction of profit incentives and competition. It is commonly assumed that these objectives can be accomplished simply by attracting private investment in new power plants and by privatising part of WAPDA. Although privatisation efforts may partially move the PPS towards the objectives outlined in Chapter 2, the success sought by the GOP in initiating this privatisation effort is unlikely without major changes in WAPDA's structure and operations.

The introduction of profit incentives and competition, if properly implemented, will ultimately improve the efficiency of the PPS. These improvements cannot be achieved, however, without fundamental changes in the PPS and the promotion of a business, regulatory, and political climate conducive to private investment. Wholesale competition with a profit incentive is necessary to force generators to reduce construction and operating costs, to use the most economic fuels and technologies, and to build new generation facilities at the most economical locations. Retail competition among suppliers of large industrial customers, as well as self generation and cogeneration, will provide incentives to purchase electricity efficiently and to price electricity properly to consumers, which in turn will stimulate cost-effective conservation and load management. Most important of all in the long run, a competitive, profit-oriented PPS will result in an efficient, market-determined amount and mix of investment in new generation and other facilities.

A. Two Models For a Privatised Electricity Sector

There is no single form of or route to a privatised electricity sector. Most electricity systems worldwide have traditionally been organised as vertically integrated monopolies either owned or heavily regulated by the government. However, governments moving toward competition in electricity have adopted some version of the fully competitive British model or are finding it difficult to progress quickly toward effective competition (i.e., in the US). The logic of electricity systems and markets puts certain constraints on the structures and institutional arrangements that can work successfully. If Pakistan wishes to effect competitive privatisation of the PPS, there must be an understanding of these constraints and the solutions must be integrated within the industry's strategic plan.

Electricity on an integrated transmission grid is not fundamentally different from other economic commodities that are traded in competitive markets, except for one thing: the production and consumption of electricity must be coordinated across the entire system on a virtually instantaneous basis. Such instantaneous coordination is absolutely necessary to maintain system reliability and safety; it is also critical for accomplishing a reasonable degree of economic efficiency. There are two basic models for accomplishing this coordination efficiently: (1) the traditional, vertically integrated

generation and transmission (G&T) monopoly, either state-owned or a regulated private utility (or group of such utilities in a power pool), that uses centralised command-and-control methods to direct the short-run activities of all units on the system; and (2) the competitive market model, in which a centralised wholesale electricity market determines the short-run actions and compensation of the individual, competing units on the system and a parallel system of bilateral contracts defines and allocates the risks and benefits of long-term investments.

The Vertically Integrated Monopoly

The traditional, vertically integrated G&T monopoly (where "T" may include distribution as will as transmission) is the dominant model worldwide. The state-owned monopolies in Pakistan, Thailand, Malaysia, India, France, New Zealand, Australia, Canada, and the privately owned regional monopolies in the US and Germany, are versions of this model. This model is not fundamentally changed by separate ownership of some or all generation on the system or even separate ownership of some distribution facilities. The defining characteristic of this model is that the G&T monopoly is virtually the sole buyer of power from generators and virtually the sole seller to distributors or final customers. It is responsible for operational despatch in the short run and for assuring the adequacy of generation capacity in the long run. Few explicit market mechanisms are required for transactions among units within the system because the G&T monopoly uses direct command-and-control methods to operate the system, pools all costs and revenues into its unified accounts, and relies on its captive customers to assure that its investment and operating costs are covered.

If WAPDA were privatised on this model, as a vertically integrated G&T monopoly subject to regulatory control, the resulting private entity would still be subject only to political and regulatory pressure. Private ownership of utility assets does not guarantee efficient performance. The state-owned Electricité de France is (rightly or wrongly) regarded by some observers as one of the most efficient electricity systems in the world; and privately-owned monopoly utilities in the US have at times been criticised for being inflexible and for "gold plating" their plants. In principle, there is little that a privatised G&T monopoly can do that a state-owned G&T monopoly cannot do. Whether publicly or privately-owned, a G&T monopoly is free to purchase power from other suppliers, contract out construction and operations, reduce excess staff levels, bargain hard for fuels and supplies, use creative financing, etc.

In practice, however, a private G&T monopoly usually has more independence than a state-owned monopoly and higher profits provides the incentive to increase efficiency. On the other hand, a private monopoly has little incentive to translate efficiency improvements into price reductions and will utilise its control of the natural monopoly despatch and transmission systems to prevent competitors from entering areas such as generation, where it has no natural monopoly. The regulatory authority required to monitor and control the activities of such a private G&T monopoly will have to be larger, stronger and more intrusive than the regulatory authority required to monitor and control a more competitive electricity sector, creating additional bureaucracy and opportunities for inefficiency. If the regulatory system is not carefully designed and managed, the pursuit of private profit may not result in increased efficiency for a monopoly utility.

The monopoly power of a private G&T company can be somewhat reduced by requiring the private company to solicit new generation from private producers, as in the Hab River Project, or to offer to sell existing generation assets to private firms, as is being pursued at Jamshoro. Such a limited privatisation may lower the cost of new generation, by attracting diverse entrepreneurs who are better than the monopolist at finding and exploiting sites, fuel sources, technologies, and staff and cost reductions, or whose potential entry provides competitive discipline on the decisions of the monopoly utility. Further, procuring capacity from competitive generators may enable the G&T monopoly to shift to project investors some of the risks associated with new power plants, such as

the risks of construction delays, cost overruns, inflation, and poor fuel procurement decisions. Even if the premium that must always be paid for such risk shifting makes the competitive prices appear unreasonably high, the net effect may be lower total costs to consumers since a regulated monopoly has incentives to underestimate costs at the front end of a project (it may not even include a risk premium in its cost estimates) and limited incentives to control costs along the way.[9]

A more fundamental weakness of the G&T monopoly model is that, as long as the monopoly controls despatch and is the only buyer of power, it will have to provide private generators with long-term purchase and price guarantees that effectively insulate project developers from political and market risks by passing these risks through to consumers. The G&T monopoly will, under these conditions, provide the credit support for the construction of private generation plants, much as though it were borrowing the money itself. Since the G&T monopoly will have to decide which generation deals to guarantee, it will be making most of the large decisions that affect system costs — decisions concerning the amount, mix and timing of new capacity, fuel prices and supply risks, and the structure of prices to consumers. If the G&T monopoly miscalculates, or if regulatory and political processes force it to buy the wrong kind of generation capacity, the G&T monopoly will still have to make good on its contracts with private generators, forcing Pakistan's consumers and taxpayers to pay the bill. Thus, requiring the G&T monopoly to purchase private generation will not introduce competitive market forces into the capacity planning process, which promises to yield the largest potential cost savings. Thus, this limited form of restructuring amounts to little more than the G&T company buying as a monopolist rather than building some of the product it sells as a monopolist.

A G&T monopoly's control of the system may also be reduced by privatising or corporatising some of the distribution functions. Conceivably, distribution system assets can be sold to private corporations that provide distribution "wire" services for a fee paid by the G&T monopoly, with the G&T monopoly remaining the seller of electricity to final consumers. Contracting out some services will be worthwhile if independent, privately-owned distribution entities are significantly better than the G&T monopoly at reducing excess local staffing, identifying and implementing cost-reducing local investments, etc.[10] If privatisation of distribution is to make a fundamental difference, however, the private distribution companies must themselves sell electricity to final consumers, which means that they must purchase their electricity from the G&T monopoly. Furthermore, the distribution company will be a local monopoly and hence its prices and services will have to be regulated. Thus, before even a limited corporatisation or privatisation of distribution can be implemented, significant changes will be required: distribution entities must be identified as business units and must establish balance sheets and income statements; some form of wholesale market must be established, if only in the form of a bulk supply tariff (BST) specifying the transfer prices at which a distribution company can buy power at various times and places; and methods must be developed to regulate retail prices and services, taking into account any politically-mandated subsidised services.

For the critical objective of generating new, particularly foreign, capital, privatising parts or all of a state-owned G&T monopoly may not by itself accomplish much. A well-run, stable, commercially viable state monopoly, e.g., Electricité de France, has no trouble attracting foreign investment in its own right, without relying implicitly or explicitly on the government's credit, while a private firm in an unstable political and regulatory environment, unable to control its prices, costs, or operations, e.g., private utilities in Spain, will not be able to attract investment at "reasonable" cost without government or international guarantees that may be the equivalent of concessionary finance. Private firms created from a state-owned G&T monopoly and dependent on that monopoly for their continued existence will not be attractive to investors unless the overall investment climate and the operations of the state-owned monopoly itself are stable and business-like. Privatisation may not increase significantly the supply of non-guaranteed capital to the PPS or to Pakistan unless there is significant improvement in the business climate for investors.

[9] *In principle, the G&T monopoly can be held to its cost estimates just as a competitive generator can, but in practice, regulation will, in the absence of gross imprudence (or bad luck), allow the G&T monopoly to pass through its increased costs. If not, then the G&T monopoly will add the same risk premium to its initial estimate or bid as the competitive generator. Of course, if a competitive generator faces higher risks than the G&T monopoly does, because of political or regulatory factors or because it is at the mercy of the monopoly, the monopoly will be able to beat the competitive bidder even when it has no real cost advantage.*

[10] *In the US, Germany, and Holland, private utilities typically serve final consumers directly without a separate distribution company, although they sometimes sell bulk power to distribution entities, usually municipally or cooperatively owned, for resale to final consumers. In France, the UK prior to privatisation, and Australia, independent distribution entities typically buy power from a state-owned G&T monopoly for resale. Distribution companies that provide only distribution services, without buying and reselling power, are virtually nonexistent.*

Privatising WAPDA as a vertically-integrated, regulated monopoly will not accomplish the GOP's goals of creating effective competition in the PPS. However, corporatising WAPDA early in the process can be a useful transition step toward a profit-oriented, competitive PPS, particularly if corporatised operating subsidiaries are also created. The government can require the corporatised WAPDA to solicit all new thermal generation from independent power producers, to desegregate its generation and distribution divisions/subsidiaries further into independent business units, to create an embryonic wholesale market, to corporatise and sell off the newly-created businesses if a as it becomes commercially and politically feasible to do so, and to plan on a future in which WAPDA's role is much reduced.[11] This is the transition strategy recommended in Chapter 6.[12]

In summary, there are advantages to selling off selected parts of a G&T monopoly that remains in central control of system operations and planning, essentially substituting contracts for direct ownership. Decentralising decisions, increasing managerial autonomy, introducing profit incentive bringing new players with new ideas into the industry, reducing political interference, etc., can all help improve the efficiency of the electricity system. However, the full benefits of privatisation wil be realised only when the G&T monopoly is largely replaced by a competitive electricity market, enabling independent, privatised generating and distribution entities to operate as real competitors in the market. Thus, if WAPDA is corporatised as a monopoly, this should be regarded as a transition stage on the road to a competitive PPS -- albeit a stage that may last a long time.

The Competitive Wholesale Market

Effective competition in an electricity system requires that customers or their agents be free to purchase directly from generators, without the intervention of a monopoly G&T entity. It is often assumed that a monopoly system can move directly to such a competitive market simply by grantir "open access" to the grid enabling generators to deal directly with distributors and end-users, payi the grid a transmission or "wheeling" charge to move the power from producer to consumer. Unfortunately, it has proven difficult to combine efficiency and competition on an integrated electricity grid. Specialised market or pooling arrangements must be carefully designed and implemented.

Open access, wheeling, and bilateral contracting cannot alone result in efficient competition in electricity because an action by one entity on an integrated transmission grid can affect other entities on the grid in immediate, uncontrollable, and unpredictable ways. Actions by one participant can change physical power flows directly or require the system despatcher to order adjustments in power flows to maintain system reliability and least-cost operation. Thus, no two parties can be allowed to enter into transactions without regard to the impact on the many third parties who will be affected. Furthermore, even if two parties are physically able to carry out their bilateral transaction at some instant without affecting others, the parties need to be able to compar their deals to other market opportunities for efficiency to result. Although such interactions exist i every market, it is only on electricity grids that market conditions can change within seconds, with effects that propagate through the entire system at the speed of light.

The only way to operate a complex electricity system efficiently is to have a central system despatcher to collect cost and demand information from all system connected market participants. Such a despatcher will then determine the least-cost way to meet demand subject to capacity constraints on the system, and will direct generators to operate accordingly, with reasonable confidence that these orders will be obeyed. In a traditional, vertically-integrated monopoly utility, the despatcher can have such control and confidence because all significant generating units are owned by a single entity that is guaranteed full recovery of all its reasonable costs, whatever these turn out to be, and hence need not be concerned about which specific units run or which specific customers receive the power. Even in traditional power pools involving several, privately-owned

[11] *It does not much matter which, if any, of the resulting power industry entities described in the next section inherits the name "WAPDA," as long as the various functions required for a competitive PPS are appropriately separated. Presumably, WAPDA will remain in charge of the non power functions of the large hydel facilities, and, hence, a subsidiary of WAPDA might naturally remain in control of the power functions at these facilities. The thermal generation, distribution and transmission/despatch functions would be separated from WAPDA during the transition period.*

[12] *Although it is advisable to restructure WAPDA as far as possible prior to corporatisation, it is not strictly necessary to do so. The Electricity Corporation of New Zealand (ECNZ) was created before it was restructured, with good short term results in terms of increased efficiency and profits even while ECNZ remains under government ownership; however, ECNZ has not made much progress toward creating a competitive market or developing a political constituency for privatisation. In New South Wales, Australia, the Government proposed to corporatise the Electricity Commission (ECNSW) prior to creation of a competitive market and structure, but Parliament has not approved it; as a result, the restructuring process in NSW is currently proceeding under the direction of the uncorporatised ECNSW. In Malaysia, the state electricity monopoly has been corporatised and will be partially sold, but without reorganisation into separate, let alone competitive, business units.*

utilities, each member has captive customers who will cover investment costs. These utilities are then willing to surrender operational control to the pool despatcher in the interest of lowering joint operating costs and sharing the benefits. With independently-owned, competitive generators that do not have captive retail customers, the problem of reliable and efficient operation becomes much more difficult.

Independent, profit-motivated generating companies cannot be expected to obey despatch orders that have cost and profit consequences unless they are compensated for these consequences. Conversely, if the system controller is given the power to impose costs and benefits on individual units without paying compensation, it becomes very risky to be an independent generator. Thus, one key to maintaining both efficient central despatch and effective competition on an electricity grid is for all generators to be subject to the despatcher's instantaneous orders. Generators will need the knowledge that they will be compensated for the resulting costs in a non-discriminatory manner; the resulting costs will then get passed through via consumer prices. The other key to combining efficiency and competition is a form of bilateral contract through which generators and consumers, perhaps through distribution companies or other middlemen, can protect themselves from short-term market risks and allocate the longer-term risks and benefits in any way they agree.

Thus, there will need to be system or "pool" rules that apply to all generators and govern despatch and pricing. Under such rules, for each despatch period (e.g., four hours or a half-hour), each generating unit will submit bid prices covering the services, e.g., energy or spinning reserves, it is willing to provide and at what prices. The despatcher selects the generator offers that meet system demand at lowest total cost, and the pool pays each generator at least what it bid for its services. Prices paid by consumers into the pool pass through the payments to generators in each period. Generators and consumers are then free to enter into bilateral contracts that share these payments to and from the pool in any way they choose, allowing them to insulate themselves from short-term pool prices to a large extent, but without destroying the short-term price signals that are necessary both for efficient short-term operations and to guide long-term investment decisions. In the end, the despatcher operates the system to minimise costs given transmission constraints, within certain agreed rules; each generator is paid the time-dependent value of the services it contributes to the pool; consumers pay prices for energy reflecting its costs including capacity or scarcity costs at the time they consume it; and longer-term bilateral contracts reduce short-term risks and provide the basis for financing new investment.

The process of despatching and paying generators based on offer prices, and selling energy to consumers at prices based on these offer prices, is a "spot" or wholesale electricity market. Such a market can be very simple or very sophisticated, depending on the nature of the system and the despatch process. If despatch is a simple process requiring very little information from generators, the bidding and price-setting process can be simple. If generation is despatched in one hour or four hour increments, rather than the half-hour or quarter-hour increments common in sophisticated systems, the "spot" price can be set for the same period. Where consumer meters do not differentiate by time, the prices charged to consumers cannot be time differentiated. When all available generation is being run and load is being shed, the price of energy paid by consumers and to generators should equal the high cost to the Pakistan economy of load shedding[13] (the deemed "value of lost load" or "VLL"). In response to prices that reflect the value of power during such critical periods, voluntary reductions in load will probably eliminate much of the need for involuntary load shedding. The fact that the despatch process may be crude should not prevent the development of a mechanism for pricing energy to reflect costs and system conditions as accurately as the despatch process allows.

The financial risks of a spot or wholesale market can and should be reduced through contracts that operate over longer time periods, such as a month, a year, or ten years. Such contracts will, for

[13] If enough consumers volunteer to be curtailed rather than pay an energy price equal to VLL, it will never be necessary to shed load involuntarily. The "shortage" of power will go away, even though the "scarcity" of power remains. In the UK, VLL is set at £2/KWh (approximately $3.60/KWh); in Pakistan, a much lower VLL would probably be sufficient to eliminate "shortages". Contracts between generators and consumers (or middlemen) can protect consumers and generators from most of the cost and revenue uncertainty of extreme price fluctuations, but do not reduce the valuable price signals at the margin.

example, give a distribution company the right to a certain amount of power at a low price in exchange for a fixed annual payment to a generator. This allows the distribution company to guarantee its customers a minimum amount of reasonably priced energy even when the spot price is very high. Anybody who uses more power than that for which it has contracted will pay very high prices, reflecting the fact that there is no uncontracted power available. Conversely, those who use less power than the amount they have contracted for may sell power and benefit from the high rates Competition for such contracts will determine their price and the income of the underlying generating units, giving those entitled to the power of each unit a direct market signal about the value of keeping this unit in operation and perhaps building more.

The concepts and methods necessary to operate a competitive wholesale electricity market and associated contracts are being applied around the world in various forms, with a clear trend toward increasing sophistication and competition. Whether, when, and how these concepts and methods should be applied in Pakistan are matters to be determined during the transition process by policy makers, the National Regulatory Authority, and users of the system. However, the privatisation process needs to move toward a potentially competitive market structure and develop a wholesale market or pool so that the competitive option for the long run is not precluded by inadequate planning. A relatively simple form of such a market or pool can be developed initially, with WAPDA providing back-up and buy-back power for non-WAPDA generators at economic and non-discriminatory prices based on system marginal costs. More sophisticated arrangements can be developed over time.

B. Options For a Privatised Electricity Sector

There are numerous ways to structure the PPS, all of which are variations or combinations of the two models outlined above. The following options were reviewed before selecting the desired long-term structure recommended in the next section.

A Single, Privately-Owned, Vertically Integrated Utility:

As in Malaysia, WAPDA could be corporatised as a vertically integrated utility and then privatised. The result would be a privately-owned utility subject to extensive regulation. Although this approach can be implemented relatively quickly and introduces profit incentives and managerial autonomy into utility operations, it sacrifices all of the benefits associated with competition, and it is very susceptible to the inefficiencies that can be caused by poor or inept regulation. As noted above, however, corporatisation of WAPDA as a holding company with subsidiary corporations operating as independent business units offers several benefits and could be a useful transition step to a competitive PPS.

Several Privately-Owned, Vertically Integrated Utilities:

Under this approach, WAPDA can be broken into several vertically integrated, regional monopolies that trade energy and capacity among themselves through a jointly-owned despatch/pooling entity, as in some US power pools. Such a system is a hybrid of the two types discussed above, but provides few of the advantages of competition and loses many of the advantages of integration. The US power pools of this type have individual member utilities that are comparable in size to WAPDA and a total pool size that is four to eight times as large as the WAPDA system. US pools have cumbersome and complicated bureaucracies and operating rules that attempt without complete success to achieve integration and some of the results of a competitive market. Most independent observers and even some members of such US pools view them as second-best arrangements made

necessary by the peculiarities of US history and political geography that do not optimise efficiency and are poorly structured for competition. Given the chance to start over with a blank slate, few people would argue for recreating the US system, which is in any case evolving, slowly and inefficiently, toward the competitive industry structure recommended by this Strategic Plan.

Partial Disaggregation:

An alternative to complete disaggregation of generation, transmission and distribution functions is to have WAPDA remain responsible for all existing generation and transmission, with only new thermal generation and eventually distribution to be privately owned. As explained above, such partial disaggregation is unlikely to produce meaningful competition, beyond that of competitive solicitations of new capacity, because it will not provide multiple sellers of power for many years. Thus, such partial disaggregation is not recommended as the long-term objective of privatisation of the PPS.

One possible advantage of leaving most existing generation with WAPDA is that it will reduce the loss of employment likely to occur following privatisation of existing facilities. However, such staff reductions are a principal source of efficiency gains in the short run and, in any case, are likely to be more critical at the distribution end rather than at generating plants. Furthermore, privatisation of existing generation is the surest and fastest way to establish the private companies most likely to invest in new facilities and demonstrate the practicality of private power in Pakistan. The objective of privatisation is the sale of as much of WAPDA's assets as soon as possible, albeit with enough time to consider the social implications.

National Distribution Entity:

One privately-owned company can provide distribution, but there is little to be gained and much to be lost by such an option. Unlike transmission, distribution is inherently a local activity with economies of scale that can be achieved with relatively small, regional, operationally independent companies. Having several such companies provides multiple, competing buyers of power and allows "yardstick" comparisons across regions. As a transitional matter creating a single, national distribution corporation may have some appeal, particularly as a way to maintain the intraregional subsidies inherent in nationally uniform tariffs and rural electrification — thereby making it easier to hide and maintain subsidies that should be transparent and temporary. Creating a national distribution company is not a productive step even as a transitional measure.

Several Regional Transmission Companies:

Ownership and control of transmission can be divided among several regional distribution companies. For an efficient national system, however, the transmission grid must continue to be planned and operated as an integrated whole. Experience in the United States indicates that this is difficult to achieve if responsibility for transmission is diffused among many entities, particularly as a competitive power market evolves. In addition to sacrificing economies of scale, a regionally desegregated transmission system will be plagued by the "externalities" inherent in an interconnected network: The investment and operational decisions of one company will impose costs and benefits on all the others, requiring elaborate planning and operational systems to coordinate actions and resolve disputes. An integrated national transmission grid is one of the principal advantages the PPS already has; it should not be discarded.

Complete Vertical Disaggregation on a Nationally Unified Grid:

The most promising long-term option for achieving the GOP's objectives is the separation of generation, transmission, and distribution functions, with a nationally unified transmission grid, multiple regional distribution companies, and independent generation companies that compete to sell power to the distribution companies, to other middlemen or to final consumers, all coordinated by an efficient wholesale or "spot" power market and long-term contracts. This option and a transition plan for achieving it are detailed in the following sections of this chapter.

Although this Strategic Plan does not deal explicitly with the Karachi Electric Supply Company (KESC), there are links between the future of KESC and the future of WAPDA. Proposals have been made to privatise KESC on the Malaysian model, as a vertically integrated monopoly, which will presumably operate in parallel with the reorganised WAPDA system through some form of power pool. For the reasons cited above, such a hybrid system is unlikely to achieve the full benefits of privatisation and competition. It is preferable to integrate KESC into the national, vertically desegregated system proposed here, by integrating the WAPDA and KESC transmission systems into a single system and creating one or more private generation companies and one or more private distribution companies from KESC's non-transmission assets. Such a solution will provide the technical and economic efficiency benefits of a national market, while increasing competition in both the national Pakistan market and in the Karachi retail market.

C. The Recommeded Long-Term Structure of the PPS

An efficient, privatised PPS requires a structure that is competitive; regulation will control monopoly power where competition is not possible. The principal structural elements of such a system can be identified by examining other utility systems around the world. The long-term structure and operations proposed by the Strategic Plan for the PPS are discussed below, in recognition that it will take many years to develop such a structure and that some of the elements of the proposed system may change during the transition process.

(1) A National Transmission/Despatch Entity:

Transmission of power from generators to grid supply points involves: (i) providing service to existing users; (ii) extending the system to new generators and users; and (iii) operation of the transmission system. This is a natural monopoly function that must be provided on a non-discriminatory basis by either a public body, perhaps representing the users of the grid, or by a private owner that is subject to a well-defined regulatory structure. The National Transmission/Despatch Entity, in concert with the distribution companies, will assume the planning responsibilities currently held by WAPDA. In the long run, the transmission system should be privately owned, possibly with ownership restricted to system users, with oversight provided by the National Regulatory Authority. Private ownership of the transmission entity is not a prerequisite for initiating privatisation.

Irrespective of the initial ownership structure, one of the first steps of the privatisation programme must be the separation of the transmission entity from the other elements of the power sector. Decisions about system operation and about where, when, and whether it is economic to extend or reinforce the transmission system, and who should pay for such services, are critical to creating a market-driven electricity system. Thus, an independent entity, responsive to the needs of the users, must make these decisions. Therefore, the

initial ownership and control of the transmission grid should be consolidated under one government-owned entity that does not own any generating or other power sector assets. This transmission entity will be corporatised, separated from WAPDA and eventually privatised. This entity will be responsible for forecasting generation requirements for the nation, utilising information supplied by the distribution companies and, possibly, the GOP. The transmission entity will ensure that the requisite investments are made in the transmission network to meet these needs.

The central despatch process and the market that will coordinate the purchase and sale of power must also be operated in an open and non-discriminatory manner by some disinterested entity. Often, the entity that owns the transmission grid also performs the despatch function because there are operational interactions between the grid and the despatch/market system[14]. In a fundamental technical and business sense, however, the function of building and maintaining wires is very different from the function of deciding which generating plants to use to meet demand in the least-cost way and determining the appropriate prices to pay and to charge.

If control of the transmission grid or the despatch/market functions remains with WAPDA, even during a transition period, the management and decision-making processes must be separated clearly from WAPDA's hydel generation planning and operations to assure that WAPDA is not even suspected of using its control of transmission and despatch to benefit its own generating units at the expense of others. The generators and customers who use and, ultimately, pay for the grid and who must live with the despatch decisions should have a major role in defining the rules and procedures under which the grid and the despatch/market entity operate, perhaps through some sort of "club" arrangement.

(2) Private, Competitive, Largely Unregulated Generation Companies:

There is no natural monopoly in the generation of electricity, particularly with the advent of smaller-scale, modular generation technologies such as gas-fired combined cycle plants. The PPS is large enough to support several competitive generation companies. If effective competition can be created, which may require only two or three separate generation companies if there is freedom of entry and competitive long-term contracting, there will be little need to regulate prices at the wholesale generation level. During a transition period, however, contracts with generators, negotiated as part of the initial agreements that establish the privatised entities, can control the short-term monopoly power of generators, with explicit regulation limited to assuring that contracts are honoured.

The GOP should eventually privatise all of WAPDA's existing thermal generation, with all new thermal generation and new mini-hydel generation privately owned. The GOP may want to establish private companies to manage the power operations of some multi-purpose water resource projects, under contracts to WAPDA. Such private operating companies can greatly improve efficiency. Creation of successful privately owned generation companies will help encourage private investment in new power plants for the reasons outlined above. In addition, it will supplement the GOP's programme of encouraging investment.

(3) A Government-Owned Hydroelectric Company:

The multi-purpose water resource projects will stay under government control indefinitely, and, hence, a government-owned company, WAPDA or another such entity, must manage the power operations of these projects.[15] This national hydel company will

[14] *Basically, the system despatcher must know the physical status of the grid at any point, including the capacity of various lines, which lines are down for maintenance or repair, when they will be back in service, etc. Fundamentally, this is no different from a traffic despatcher having to know how wide the roads are and which bridges are out and does not require the grid/road owner to control all traffic.*

[15] *However, WAPDA need not be the actual operator of the power facilities. If contracts can define the rights and obligations of the power operations of a specific multi-use facility, a separate operating division or profit center can be created to operate each hydel power plant; these business units may even be privatised at some point. In the transition period, "privatisation" may involve little more than tendering for operating contracts for WAPDA-owned power facilities; this would be a useful start toward creation of independent, private, hydel companies.*

operate existing hydel projects and assure that power operation is consistent with irrigation, flood control, and other considerations. It will also build and operate hydel projects that are authorised by the GOP, but which the private sector is unable to pursue. All of WAPDA's hydel projects should operate as efficient competitors in the electricity market, both to increase the degree of competition in the market and to encourage efficient operation within the company itself.

(4) Private, Regulated Distribution Companies:

The entities that provide local distribution or "wire" services, including reading meters and billing, are inherently natural monopolies. The current AEBs will become privately-owned distribution companies, but must be regulated in this function. AEBs not viable as commercial entities can remain under government ownership until they prove attractive to private investors. However, a definite deadline for increasing commercial viability and eventual privatisation should be established. The retail "supply" business that purchases power from the wholesale market and resells it to retail consumers can, in concept, be a competitive activity, provided that the "wire" business provides non-discriminatory service. Large industrial and commercial customers should be free to access sources of power other than their local distribution company. As a practical matter, however, smaller customers are unlikely to be able to buy from a supplier other than the local distribution company, at least during some transition period, and, hence, the supply function must also be regulated. The distribution companies will be responsible for the planning and acquisition of resources needed to meet their customers' needs, thus removing these services from WAPDA's control and responsibility.

The local distribution companies must have the obligation to provide two different services to any customer who wants them: (1) the distribution "wire" services, such as connection to the system, meter reading, billing; and (2) the power supply services of purchasing power at wholesale and reselling it at retail. Smaller customers may never see the distinction between these two services, simply paying their local distribution company for delivered electricity. Larger customers, however, may have the right and the ability to purchase distribution "wire" services from the local distribution company and power supply services from a competitive power merchant/middleman or directly from a generator. The local distribution company's obligation to serve will at least eventually be limited to the obligation to provide distribution services on a nondiscriminatory basis and to provide power at the wholesale market price plus a reasonable mark-up.

Distribution companies will also provide socially mandated subsidised services (e.g., rural electrification and "lifeline" rates) for which they will be paid under contract. In most cases, a GOP ministry will have funds budgeted for some specific national objective and will contract with a distribution company or some other entity to provide the indicated services. For example, a distribution company will provide power at low rates to certain customers, credit a specified amount against their bills, or extend the distribution system to rural villages pursuant to the GOP's formal directive, utilising funds provided directly by the GOP. As mentioned in Chapter 2, it is better for the GOP to make direct income transfers because the subsidies then become transparent and explicit. Further, this mechanism requires the GOP to decide about how to use scarce capital resources to accomplish competing social objectives. Of course, the provincial governments will be free to add their own payments to distribution companies if they wish to promote or extend other social objectives. The National Regulatory Authority or some GOP auditing agency will monitor such subsidy programs.

(5) A National Regulatory Authority:

Because important functions remain natural or de facto monopolies even after the transition to a "fully" competitive, privatised PPS, some regulatory authority is required. Although there are options for the structure of such an authority, the preferred model, as outlined in Chapter V, is a national authority, under the direction of an independent, professional commission. The primary job of the NRA will be to protect consumers' interests by controlling prices in the non-competitive parts of the PPS (i.e., transmission and distribution), by monitoring and enhancing the competitiveness of the PPS, by overseeing the design and operation of the despatch/market function, by monitoring the reliability of the electric power sector, by accumulating and distributing information regarding industry performance and market developments, and by ensuring that subsidised services are responsibly provided. The GOP may also want to make the NRA or some other entity responsible for controlling access to water and land for privately owned power projects. Charters or licenses that all industry participants must accept as a condition of doing business in the industry and general competition law will define the NRA's enforcement mechanism. Ultimately, the NRA will be able to ask the GOP to take legislative action to remedy a problem.

D. The Transition to a Competitive Electricity Market

The foregoing Section recommended a long term structure of the PPS that holds much promise for Pakistan. However, the transformation of WAPDA's power system into a privatised, competitive electricity market will be an evolutionary process that will take many years[16]. The timing of this evolution and the final form of the PPS cannot be predicted with authority now, because they will depend on many intervening policy decisions and external factors. This section outlines four principal phases that the PPS will go through during the transition to a competitive market, with general indications of how the PPS will operate during each phase and the principal benefits and risks associated with each phase. Chapter 6, dealing with the implementation programme, describes the analytic, managerial, and policy actions that must be undertaken during each phase to prepare for the next transition stage. This approach divides the reform of the PPS into manageable steps. It will yield immediate benefits and improve the long-term prospects for success without prematurely committing the GOP to an irrevocable course of action.

Phase I: Unitary WAPDA Monopoly (Preparing the current system for the future)

For a period of a year or so, WAPDA will operate essentially as it does now, owning and operating essentially all generation, transmission, and distribution, and recovering its costs through nationally uniform tariffs charged to final consumers. This initial phase will be primarily one of policy formulation and internal WAPDA restructuring. However, the GOP can take actions that provide immediate benefits at little risk: a Strategic Plan will be adopted; a competitive bidding programme for new capacity will be designed as outlined in Chapter 6; one or more thermal plants, e.g., Jamshoro, will be corporatised/privatised; and one distribution entity, e.g., all or part of the Faisalabad Area Board, will be prepared for corporatisation.

The benefits that will accrue to Pakistan during Phase I of the transition will come primarily from changed perceptions and expectations, and from laying a solid groundwork for further progress. Adoption of the Strategic Plan will set the GOP firmly on the path toward creation of a private, competitive PPS. More concretely, enactment of the competitive solicitation process and progress on the initial corporatisation and privatisation efforts will demonstrate the GOP's commitment to

[16] *Ten years or more may be required to develop a substantially competitive electricity system. In the UK, privatisation took place three years after publication of the White Paper setting forth the government's objectives, and even then a further transition period of eight years was written into contracts and regulations. In the US, it has been thirteen years since legislation required regulated utilities to purchase power from competitive suppliers, and full competition even in generation, let alone at the retail level, is still in the indefinite future, at best.*

its stated objectives. The analysis and planning during Phase I will assure that actions in later phases have the maximum chance of success.

There are few significant risks during Phase I of the transition plan, because WAPDA will continue operating essentially unchanged. The principal risks are that the GOP may not, in fact, make progress towards its stated objectives. This can be mitigated by not raising unrealistic expectations. During Phase I, the schedules and objectives of later phases will be evaluated and, if necessary, adjusted in the light of emerging information and experience.

Phase II: Decentralisation, Corporatisation and Selected Privatisation

This phase of the transition will be the most difficult. The GOP will restructure WAPDA into decentralised business units, some of which will be corporatised or even privatised; the bulk of WAPDA will be corporatised as a holding company. In addition to the Power Wing, the GOP should reorganise other WAPDA wings that functionally support the Power Wing. Generation divisions/subsidiaries must be defined, and management, balance sheets, transfer prices and contracts put in place.

The definition and corporatisation of distribution entities will be more difficult. This will require a geographic configuration of the AEBs that makes business, operational, and political sense. Sound business systems will have to be established. Initially through internal accounting mechanisms and increasingly through formal contracts, WAPDA will begin buying and selling power under contract with generating and distribution entities, with a simple wholesale "spot" market based on the despatch process providing back-up and stand-by power on a non-discriminatory, system-dependent basis. This market, which will evolve during Phase II, will allow the separate generating and distribution units to operate as distinct profit centres.[17]

During this phase, WAPDA will no longer build or own its own thermal plants, but will instead solicit all new thermal generation through a competitive process, offering power purchase contracts that will ultimately be transferred to the distribution companies, other retailers, or final consumers as they develop the capability to handle such contracts.[18] As existing generation and distribution entities become commercially viable, they will be sold through a public offering or a negotiated trade sale. The GOP must carefully consider the terms and timing of these sales to mitigate the social disruptions that will occur as profit-oriented management seeks to reduce staff and other costs. The GOP must also develop direct tax, budget, and subsidy arrangements so that existing cross-subsidies can be phased out without eliminating socially desirable programs.

This phase will also witness the creation of the National Regulatory Authority, which will assume its role as advisor and facilitator in the ongoing corporatisation and privatisation efforts. Little explicit regulation will be required during this phase because the WAPDA core will remain under GOP ownership and control and its increasingly privatised subsidiaries will be subject to the licenses and enforceable long-term contracts imposed on them during the privatisation process.

During this phase, the transmission system will become an increasingly independent entity, first as a division within WAPDA with separate management objectives and reporting responsibilities, and then as a distinct corporate subsidiary. The transmission entity will develop investment criteria, cost-recovery mechanisms, and consultative processes to help guide its future investments and to make it financially self-sufficient. Its revenue will come primarily from fixed charges paid by generators, distribution companies, and other users of the grid; rates will reflect the cost of providing transmission services to different types of users at different locations on the grid, with mechanisms for long-term transmission contracts. If the GOP, for national policy reasons, wants the transmission entity to provide transmission service to certain users or regions, the GOP may need to

[17] *This wholesale market need not be a "real time" market, but must provide prices, which may not be known precisely until after the fact, that reasonably reflect the true value of energy and capacity to the system at any time. A generating unit cannot maximise its value, however, until it knows how valuable its output is to the system as a whole, given the way the system is actually operating. This requires some form of time-related or "spot" pricing of energy and capacity. In the absence of such system-related, time-related prices, profit incentives obviously result from giving a generating unit a contract prespecifying the prices that will be paid for energy and capacity at various times. However, such an arrangement provides no incentives for responding to the many important events that cannot be prescheduled and provides no way of knowing whether the system really benefits from the continued operation of the generating unit or the addition of similar ones. Similarly, system efficiencies are not maximised unless the prices a retailing entity pays for energy at each time and place reasonably reflect the costs to the system of providing that energy.*

[18] *As discussed in Section F of Chapter 3, limited GOP involvement in new thermal generation may be necessary if the response from the private sector is inadequate to meet capacity requirements.*

provide the needed funds directly, perhaps using the concessional transmission financing that is currently available to WAPDA.

This phase of restructuring and progressive corporatisation/privatisation will last several years, with the PPS operating with a government-owned WAPDA core consisting of the transmission system, the major hydel facilities, some older thermal plants (which may be retired), and those parts of the distribution system (i.e., the rural and tribal areas) that have not received sufficient financial support from the GOP to become commercially viable. The benefits that will accrue to Pakistan during this phase include the greater availability of capital and the operating efficiencies that will come from increased privatisation and competition; these benefits will grow slowly during Phase II, as corporatisation and privatisation proceed and the private sector gradually gains confidence in the new system.

There are three principal risks during Phase II, in addition to the continuing risk from Phase I that unrealistic expectations will be disappointed. First, the new business units created within WAPDA may not perform well because of poor planning or execution of the process, management failures, or labor and political opposition. Second, even though the individual business units may function reasonably well, the system as a whole may suffer if decentralisation outruns the creation of effective coordination institutions, particularly the wholesale market based on the despatch process. Either event will increase the third risk: unwillingness of private investors to purchase existing assets or to invest in new projects on terms that are economically attractive to Pakistan.

These risks will be minimised by the phased, adaptive approach recommended in this Strategic Plan. Separate WAPDA business units should be created and corporatised as soon as practical, but only after careful preparation, and in a sequential manner that limits the risks and allows for learning-by-doing. Development of the wholesale market and contract arrangements must be a high priority item in Phase II to assure that the coordinating mechanisms are in place as decentralisation proceeds. The sale of assets to private investors should be carefully planned, with adjustments made to reflect experience gained through each sale.

Phase III: Test and Refinement of Competitive and Regulatory Structures

During this phase, the business, market, contract, subsidy, and other systems essential to a successful competitive privatisation will be tested and adjusted as necessary. As confidence in the new system increases, the remaining business units will be privatised. WAPDA's core role will be reduced to owning and operating the principal hydel facilities, presumably as profit-oriented subsidiaries. The transmission and despatch/market systems will be separated from WAPDA and will form an independent, national corporation. Methods will be developed to assure that the generators and consumers who benefit from and pay for these systems have a major influence on investment decisions and operational procedures. It will take many years to develop the investment criteria, cost-recovery mechanisms and regulatory rules to govern the provision of transmission services. For this reason, the Strategic Plan recommends that privatisation of the transmission entity should be one of the last steps in the transition process. As planning responsibilities are increasingly transferred to the privatised power sector, review of the market signals and the response of the generation, transmission, and distribution entities will be conducted to determine the adequacy of information flows.

During Phase III, the wholesale market and contract arrangements among the separate, largely-private entities in the PPS will become increasingly sophisticated. The retail rate and direct subsidy policies developed during Phase II will be implemented and tariff cross-subsidies will be phased out. The National Regulatory Authority will assume an increasingly important role, as the contracts imposed by WAPDA during the initial privatisation expire and are renegotiated, and as licenses and

regulations are adjusted in response to identified problems. In short, the long-term structure and operations of the PPS will be defined and put into place during this phase.

The benefits of privatisation and competition will grow significantly during this phase, as the PPS begins to function as a private, competitive industry and investors gain enough confidence in the system to begin investing significant amounts of non-guaranteed capital without high risk premiums. Risks will be minimised by the opportunity to make adjustments before final privatisation. A major risk in this phase will be that the benefits from corporatising and restructuring WAPDA may increase pressure to stop short of full privatisation and competition — pressure that should be resisted if the long-term benefits of privatisation are to be fully achieved.[19]

Phase IV: Full Operation of the Private, Competitive PPS

Eventually, WAPDA's successor organisations and the PPS as a whole will be structured and operated as described in the long-term competitive model of the previous section. Of course, it is likely that policy changes or external events during the transition process will cause modification of details or even some significant features of this long-term model during the transition period, or that one of the intermediate phases described above will be found to provide an acceptable degree of privatisation and competition, given the evolving objectives and realities of Pakistan. When the PPS has reached this stage, centralised GOP planning and implementation will no longer be necessary; the private sector will respond to market signals. This stage completes the transition from a centrally planned and operated power sector to a market-based private power sector.

[19] *In New Zealand, the improvements in efficiency and profits of ECNZ following corporatisation have been so dramatic that there is little political enthusiasm for moving ahead with privatisation, even though there are still significant economic benefits to be gained from introducing competition and reducing political interference in the industry. In New South Wales, significant efficiency improvements were made even without corporatisation, simply by putting a business-oriented management into ECNSW, instructing them to focus on the bottom line, and avoiding political interference; as a result, political support even for corporatisation of ECNSW has been reduced, even though there is still a long way to go to achieve the full benefits of corporatisation and privatisation. Successful privatisation requires political commitment over many years, with each step locked in through basic structural, legal and ownership changes as soon as possible.*

5

NATIONAL REGULATORY AUTHORITY

Regulation of privately-owned businesses should be limited to activities that cannot be disciplined through market competition owing to a variety of market deficiencies, including "externalities" that are not reflected in the costs of production (such as pollution) and the ability of market participants to exclude or control competitors. This Strategic Plan recommends maximising the role of competition and contracts in disciplining the operation of the power market, with regulation limited to where it is essential. Competition does not exist in any sector of the PPS, and many institutions needed for an efficient, private electricity sector have yet to be developed. Accordingly, a regulatory structure must oversee the transformation of the PPS and regulate only those aspects of the power industry that cannot be disciplined through competition.

A strong National Regulatory Authority is necessary to regulate those aspects of the electric power sector that remain a natural monopoly, to foster and preserve the competitive structure of the electric power industry, and to ensure the coordinated, reliable and adequate supply of electric power.

A. Regulatory Tasks and Objectives

There are several elements of the PPS that, by their very nature, may never be subject to effective competition. These include transmission, distribution "wire services," the use of land and water resources for power production, and rural electrification. In addition, there are elements of the PPS that may not be subject to competition for many years, such as power planning, procurement, and marketing, (e.g., supplying power to the newly privatised distribution companies and industrial, commercial and retail consumers), and may therefore require regulation until the proven presence of competitive pressures.

A variety of regulatory approaches are possible, from comprehensive regulation requiring the NRA to monitor the day-to-day activities of the regulated entities, to "light-handed" regulatory techniques that structure financial incentives to induce efficient management, acceptable prices, and the non-discriminatory provision of the regulated service.[20] As a general proposition, the NRA should minimise the burdens of regulation, in terms of both the scope of regulatory activity and the interference with the management of the regulated entities. Whenever possible, an incentive structure should align the interests of suppliers and consumers, thus eliminating the need for constant oversight. Requiring all electric services, such as power sales, transmission, and the distribution "wire" services, to be sold separately, i.e., "unbundling," can facilitate this, as can competition and performance standards and incentives. [21]

The role of the NRA and the appropriateness of its regulation will change through each phase of privatisation. Initially, the uncertainties associated with privatisation and the embryonic status of competition in Pakistan will require more aggressive forms of regulation, although the contracts and licenses established at privatisation may make formal regulatory proceedings less necessary for some time. Before competition is fully developed, but while the PPS is undergoing significant changes, an active NRA will be necessary. Eventually, as the PPS becomes fully competitive, the need for regulation will diminish and the NRA's latitude to adopt more "light-handed" regulation will increase.

[20] *For example, regulators can protect the interests of captive retail customers by monitoring the prudence of their supplier's power procurement decisions, either by after-the-fact regulatory review or by automatically establishing the prudence of procurement decisions utilising the results of competitive power solicitation programmes.*

[21] *Unbundling electric power services makes regulation a great deal easier. It enhances the amount of information available about transactions and minimises the opportunities for cross-subsidisation of services, thereby reducing the incentives for regulated entities to pursue inefficient transactions. More fundamentally, unbundling often limits the scope of regulation by introducing competition into the provision of a service that, because of its historic association with other natural monopoly services, has traditionally but incorrectly been assumed to be a natural monopoly.*

4.9

The NRA will serve a critical role during each stage of the implementation programme set forth in Chapter VI. It will monitor the privatisation effort, advise the GOP to ensure that privatisation does not undermine progress towards an adequate and reliable supply of electricity, and help determine the timing of each stage of the implementation programme.

1. Regulation of Natural Monopoly Functions

Historically, electricity supply, from generation to delivery to end-users, has been a natural monopoly. All aspects of the utility business exhibited economies of scale, and concentration of demand minimised the cost of providing electric service. A monopoly is "natural" because a single company will always be able to attain lower costs than several smaller competitors.

To avoid monopolistic abuses and to assure an ample supply of electric power at a reasonable cost, privately-owned utilities were granted monopoly franchises to generate, transmit, and distribute power. In return, utilities assumed a legal obligation to serve all customers within a given geographical, franchise area and became subject to extensive regulation. Utilities were able to exploit economies of scale associated with the power industry, thereby achieving the lowest possible production costs, while consumers were protected against monopolistic abuses.

In recent decades, however, technology advances have eliminated the economies of scale in generation, mitigating the need for regulation of that activity. Two aspects of power supply are still "natural" monopolies: (1) transmission and the corresponding despatch and pooling services; and (2) distribution "wire" services. As such, the national transmission entity and distribution companies should be subjected to price and limited command and control regulation. The NRA will supervise provision of these services, and the ultimate providers will have to obtain NRA or other government approval before undertaking new investment, issuing debt, disposing of assets, or extending socially desirable "subsidised" services.

a. Rate Regulation

Since the national transmission entity and distribution companies will be monopolies with captive customers, the rates, terms, and conditions of transmission, despatch and pooling services, and distribution "wire" services must be subject to strict regulatory scrutiny and approval.

To ensure the financial viability of transmission and distribution companies, tariffs must permit recovery of the full costs of providing these services plus a return on equity sufficient to attract financing for capital improvements and new construction. The return on equity will depend upon the business climate and financial health of the regulated company. It is likely that the return will have to be higher than is traditionally acceptable in Pakistan to compensate investors for the perceived risks of the newly privatised ventures and the uncertainties associated with investing in Pakistan. The required rate of return should drop significantly over time, however, as investor confidence is achieved and the regulated entities, the NRA, and the GOP establish a commercial track record.

The transmission and distribution companies should not, however, be guaranteed recovery of all their costs with a specified rate of return because a monopolist with both captive customers and such a guarantee has no incentive to control costs. Rate regulation should encourage efficiency by making the regulated entity's return on equity dependent on management's success at controlling costs.

There are two primary ratemaking techniques available to the NRA: cost-of-service or profit regulation, as typified by US regulation, and indexation or price regulation, as typified by UK regulation.

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Under cost-of-service regulation, regulators closely evaluate utility expenses after they have been incurred and then decide whether such costs should be recovered from customers and what rate of profit should be allowed. Generally, cost recovery is permitted if the regulator concludes that the expenses were "prudent," that is, reasonable in light of the circumstances known to management when the expenses were incurred. Utility rates are set to recover the allowed costs and profits. Cost reductions below projected levels result in higher profits to the utility until its rates are reviewed and possibly adjusted.

With indexation regulation, instead of closely reviewing management decisions to determine what costs should be recovered from customers, the regulatory authority establishes an initial price ceiling and indexation formula and allows the regulated entity to earn as much profit as possible by cutting costs below the ceiling price.[22]

The differences between cost-of-service regulation and indexation are not as great as it might first appear. With indexation, in setting the initial price and indexation formula, and in revising it periodically, the regulator must consider both the prudence of the utility's past costs and the level of its expected profits. Thus, in practice, the difference between profit and price regulation relates primarily to *how often* costs, profits and prices are reviewed, not to *whether* these factors are considered.

Cost-of-service regulation is well-understood, is relatively easy to implement, has been used successfully to regulate privately-owned electric utilities for decades, and gives regulators leverage over utility management. However, cost-of-service regulation can send inaccurate price signals and may blunt the profit incentives for regulated entities to take risks and improve efficiency.[23] Many US regulators are seeking ways to introduce some form of indexation or price regulation (often called "incentive regulation") in order to encourage productivity improvements, provide wider latitude for prices to reflect market conditions, and reduce regulatory uncertainty and the opportunities for political and regulatory interference. Indexing does not, however, eliminate all uncertainty and regulatory leverage as the formula used in the index remains subject to regulatory review and modification.

The best combination of cost-of-service regulation and indexation to use in Pakistan cannot be determined at this time.[24] Leverage over utility management has certain advantages, particularly in the context of Pakistan, where it has been suggested that investors have a very high discount rate and will take advantage of opportunities to pull their return and equity out of power investments as quickly as possible by reducing expenditures on operations and maintenance to imprudent levels. Active monitoring and leverage over utility management may be necessary to protect against this possibility, perhaps through required periodic reports that will enable the NRA to monitor private investor activities. How rates and the quality of electric power services should be regulated in light of these concerns requires further study.

Although no single technique solves all of the problems associated with cost-of-service rate regulation, the arsenal of ratemaking techniques is expanding and, when used in combination, can serve as useful regulatory tools.[25]

The NRA must also regulate the power marketing functions of the distribution companies, including determining whether to grant distribution companies exclusive franchises to sell power to certain customer classes or to allow the provision of only "wire" services to end users. If power supply franchises are not exclusive, then competition for power sales to residential, commercial and industrial customers (retail sales) can provide market discipline and the distribution companies' power sales may not have to be regulated. Indeed, experience in other countries indicates that robust

[22] *To take inflation into account and provide an incentive for productivity improvement, the price ceiling is generally allowed to increase year-to-year by a factor referred to as "RPI-X" — the retail price index (RPI) less a deflator (X) intended to reflect a feasible rate of cost reduction.*

[23] *Four problems are generally associated with traditional forms of cost-of-service rate regulation. First, traditional regulation sets prices based on past incurred costs rather than expected future costs. Second, cost-of-service rates may be deemed perverse, i.e., established without regard to the relative abundance or scarcity of power. When demand for power exceeds supply, rates drop as production costs are allocated over more sales units instead of increasing to allocate scarcity. Third, critics claim that, since regulators increase rates to accommodate increased costs (and decrease rates when costs are reduced), utilities are not rewarded for reducing costs nor are penalised for allowing costs to increase. Finally, traditional forms of cost-of-service rate regulation do not compensate utilities for risk taking. The benefits of risky ventures have often been passed through to customers, while the losses due to risky ventures are not allowed to be recovered from customers. This imbalance between risk and reward results in regulated utilities pursuing less risky, but more costly, activities and, in some cases, avoiding supply services altogether.*

[24] *As a practical matter, it is not feasible to regulate distribution companies' power sales to captive retail customers on any basis other than a full pass-through of costs-plus-reasonable-profit. Simple price ceilings indexed to inflation less some expected productivity improvement ("RPI-X" in the UK) may (or may not) work in the short run for services such as transmission or distribution "wire" services where most of the costs are fixed. But generation costs vary widely in the short run depending on fuel prices, plant availabilities, the weather, etc, so any simple price formula will subject the distribution companies to widely varying cash flows and risks. Pragmatic experience in the US and intense analysis in the UK led both systems to base the regulation of retail prices on the pass-through of wholesale power costs.*

[25] *Recently, critics of cost-of-service regulation have been exploring alternative forms of rate regulation, including: (1) marginal or incremental cost ratemaking which sets rates based on expected future costs; (2) ex ante*

regulation where regulators preapprove expenditures with cost recovery of such expenditures being guaranteed; (3) market-based rates that are negotiated without regard to cost-of-service but subject to a cost-based price cap or ceiling; (4) incentive regulation designed to encourage utilities to pursue "socially desirable" results, such as energy conservation, demand side management and use of renewable resources; and (5) formal and informal competitive solicitations for acquiring new generation.

competition for retail sales not only disciplines the rates utilities charge their retail customers but also results in significant efficiency improvements in utility operations.

Initially, the distribution companies' service franchise for power sales should be exclusive, at least for residential and small commercial and industrial customers. Even in the long run, a reliable supply of electricity is so important that distribution companies must have a legal obligation to sell power to all customers within their service areas on a regulated but full cost recovery basis.

To the extent that distribution companies' rates for power sales to certain customer classes remain regulated, tariffs and regulatory policies must encourage cost-effective conservation and the acquisition of power at the lowest possible cost. This is necessary in order to promote prudent management, to balance the risks and rewards associated with power procurement programmes, and to provide retail customers with accurate price signals regarding the relative scarcity/abundance of power supplies.

The regulation of the distribution companies is more complicated and politically sensitive than the regulation of the transmission, despatch, and pooling services, since there will be political pressure to continue cross-subsidies to residential customers and other segments of the economy. This Strategic Plan recommends the elimination of cross-subsidies as a long-term goal of privatisation, but recognises that during the transition period certain subsidies will have to be continued on at least a temporary basis. As mentioned before, the GOP should make direct payments to the distribution companies to continue socially desirable functions, such as rural electrification and lifeline rates. The resources necessary for these payments to the distribution companies should be raised through general taxation or taxation of electric sales over the national transmission system. These subsidies do not require distribution companies to be given exclusive service franchises.

The GOP may wish to eliminate cross-subsidies gradually. The separation of the AEBs into separate companies and the introduction of retail competition will make the preservation of the cross-subsidies difficult. Cross-subsidies among customer classes require that distribution companies be sheltered from retail competition. Cross-subsidies across regions require interregional/intercompany transfers. Thus, if the GOP desires to maintain cross-subsidies for some period, it may be necessary to restrict retail competition and perhaps even to delay separation of some AEBs as distinct business units.

Nonetheless, to eliminate existing cross-subsidies, the GOP should design the NRA and PPS to make it difficult to use rates to create cross-subsidies. Retail competition, limited initially, but increasing over time, cogeneration and self-generation all serve this objective. As long as such competition is limited to large industrial customers, the distribution companies will remain in a secure position to satisfy their obligation to serve residential, commercial, and small industrial customers. Once the NRA has gained confidence in the success of privatisation and the competitiveness of the retail market, it can relax the regulation of distributing companies' retail sales and relieve distribution companies of the bulk of their obligation to serve.[26]

Finally, since generation is no longer a natural monopoly, once a wholesale market is in place, the rates, terms and conditions for power sales by generation companies will not need to be regulated.[27] In the short run, existing generation plants will be subject to contracts imposed on them prior to privatisation, and new plants will result from competitive solicitations yielding long-term contracts. Thus, contracts and not necessarily formal regulatory processes will discipline prices and protect consumers. However, once the distribution companies procure their own power, a short-term energy market will develop. Absent competition, rates for short-term power sales will have to be regulated.[28] Competition for short-term sales of electricity should not be difficult to demonstrate, however, once the wholesale market becomes robust.

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[26] *Once relieved of most of their obligation to serve, the distribution companies will not have to plan and acquire generation capacity to serve customers other than residential customers and industrial and commercial customers who have requested such services. This is not to suggest, however, that customers who are not relying on the distribution companies' obligation to serve will be cut off from electric power. The distribution company will continue to serve as a delivery agent for such customers, and electric delivery service will continue to be provided on a non-discriminatory basis. The significant difference is price. Customers who have arranged to meet their own needs (and are not relying on the distribution company's obligation to serve), must be willing to pay whatever price the distribution company or other suppliers charge for power.*

[27] *There are still economies of scale to be obtained from large generation facilities. However, the potential market for power in Pakistan appears to be sufficiently large to support several generating companies. Generation is not a natural monopoly, because demand for power does not need to be concentrated and dedicated to one power supplier for the system to benefit from the economies of scale associated with power production.*

[28] *In evaluating the competitiveness of the wholesale power market, it is critical to recognise that power shortages and limited capacity do not necessarily indicate that the wholesale power market is not competitive. All markets go through periods when supply is less than demand of the "customary" price. In a properly functioning competitive market, limited supply will result in increased prices — which in turn allocate supply to those that value it the most and encourage additional investment that increases supply. Markets are not competitive when increased prices do not, over time, increase supply.*

52

The NRA should foster a stable regulatory environment conducive to the encouragement of private investment in power plants. The NRA should also help the distribution companies develop formal competitive power solicitation programmes. To regulate effectively, the NRA must also develop accounting standards and a uniform system of accounts with industry-wide applicability.

b. Command and Control

In addition to rate regulation, privately-owned utilities have been subject to various forms of command and control regulation, whereby utilities must obtain government approvals before undertaking certain activities. These controls include: (1) ensuring that utilities do not undermine their financial viability by engaging in unreasonable or unnecessary activities; (2) ensuring that utilities meet their legal obligation to provide electric service; (3) ensuring the reliability, coordination, and provision of electric power; (4) protecting national security interests; and (5) developing an electric power industry that is consistent with national priorities regarding the use of natural resources, including land and water.

Command and control regulation can require a utility to obtain a government granted franchise or license to engage in any aspect of the electric power business, including meeting prespecified standards designed to ensure the quality and reliability of service. A second form of command and control regulation is that of corporate regulation. For example, in the United States, privately-owned electric utilities must obtain government approvals to dispose of assets, to merge or consolidate facilities, to issue or acquire debt or securities, and to engage in transactions with affiliated entities or in business areas unrelated to electric power. Indeed, certain corporate structures and business activities are prohibited.

The NRA can also use command and control regulation to require utilities to provide socially desirable services or to conduct business in a manner consistent with certain national objectives. Electric utilities can be ordered to provide rural electrification, to use certain fuels or to procure power from particular sources of supply, and to engage in energy conservation and load management.

Command and control regulation interferes directly with the operation of the market by dictating particular results that are often unrelated to market signals. It also maximises the opportunities for political interference. The NRA should use such regulation only in situations where "externalities" require such action, or where "light-handed" approaches to regulation are not effective.

Since the transmission and distribution companies will be monopolies with captive customers, the NRA will have to help develop and police compliance with the rules that will govern the coordination, despatch, and pooling of generation facilities, as well as the operation of the national transmission grid. The NRA should also regulate such entities' corporate activities to ensure that they do not get involved in activities inconsistent with their primary responsibilities.[29]

2. Regulation to Ensure the Coordinated, Reliable, and Adequate Supply of Electric Power

In a fully competitive electric power sector, electricity prices and competition will result in an adequate and reliable supply of electricity at a reasonable price. However, this competitive state is not likely to be attained in Pakistan for many years. Therefore, the NRA must serve several important functions. First, the NRA must monitor the progress of privatisation. It will advise the GOP regarding measures to improve both the privatisation programme and the climate for private investment in power projects.

[29] *For example, to ensure the non-discriminatory provision of electric power services, particularly transmission and distribution services, it is simplest for transmission and distribution companies to be prohibited from investing in generation plants. In this fashion, neither type of entity has a financial interest in providing preferential services to an affiliated entity. Absent such a prohibition, the NRA will have to monitor transactions to protect against cross-subsidies and the various abuses that result from affiliated transactions.*

Second, the NRA should monitor the progress of the PPS in meeting Pakistan's power needs. WAPDA or some other government entity must remain the power supplier of last resort and be responsible for buying or building new generation if the private sector is unwilling to so. However, that government entity cannot also be responsible for deciding when the private sector investment is inadequate; otherwise the government entity will become the builder of primary resort. A better approach is to have the NRA or some other government authority responsible for authorising publicly financed investment in power facilities.

Third, the NRA will be responsible for ensuring adequate service by the transmission and distribution companies. Initially this can be accomplished by monitoring transmission and distribution company planning and, to the extent competitive discipline is inadequate, through rate regulation. If the distribution companies sell power to captive customers, the NRA can review least cost planning efforts, the use of conservation, system design, operation, maintenance practices, and contingency plans. "Light-handed" regulation is the best approach here.

Fourth, the NRA must also help establish and monitor the operation of the national grid and the power pooling and despatch system. Regulation may be necessary to ensure the coordinated economic despatch of generation and to provide pricing stability. The degree of regulatory involvement will depend upon the design of the power pooling/despatch system. Ideally, the NRA should work cooperatively with the PPS in designing the rules for power pooling and control despatch. Once pool and despatch operations have been established, regulatory involvement can be limited to monitoring pool operation and assessing the merits of any proposed changes to grid/pool operation.

Fifth, some entity associated with the government must integrate the provision of social programmes and national developmental goals into the operation of the private power sector. License terms can obligate private entities to comply with various goals, such as a distribution company's obligation to engage in rural electrification and to provide "lifeline" rates. The NRA need not be the entity responsible for developing and implementing national energy policy; in most other countries, these responsibilities are the province of an energy ministry that is more politically responsive than is desirable for the entity responsible for regulating the private power sector. Nonetheless, the NRA can be very useful in acquiring information from the private sector that will be important to the development of national energy strategy. In addition, the NRA is the logical choice for the GOP entity that will be responsible for monitoring the provision of subsidised services.

3. Regulation of the Use of Natural Resources

There are competing interests regarding the use of certain natural resources for power production. The two most obvious examples are hydel development and the siting of power plants and transmission facilities. The use of such resources often involves matters of national interest that are not reflected in the price of land or other resources and must therefore be regulated.

The GOP should explore the possibility of consolidating the regulation of certain natural resources, most notably water and land, for privately-owned power production under the NRA.[30] Under such a scheme, the NRA will issue permits for the private use of a natural resource only after concluding that such use is in the national interest and that there are no competing uses of that resource that should take precedence over power production.

The GOP might want to make the NRA the ultimate arbiter over whether land or water should be used for privately-owned power production. In making its decisions, the NRA will have to consider the opinions and recommendations of all other interested parties, including provincial governments

[30] *The NRA's activities in this regard should be limited to privately-owned power plants. The GOP should remain interested in developing large hydel projects that serve irrigation and other national interests not directly related to the production of power. The NRA should not be responsible for evaluating such projects. Rather, the GOP should decide whether or not to pursue those projects as a matter of national policy and then authorise WAPDA or some other entity to initiate such projects.*

and other provincial and federal resource agencies.[1] However, having made its decision, the NRA's judgment can preempt contrary provincial and other federal authorities. Further, the NRA can be given the authority to authorise the use of condemnation proceedings if the private sector is unable to obtain the ownership and rights to that resource through other means. Of course, the NRA will have to be granted this legal authority in its enabling legislation, and such legislation will have to be consistent with the constitution.

B. Structure of National Regulatory Authority

The GOP needs to address issues regarding the implementation of regulation, in addition to defining the appropriate scope of regulation. These issues include whether the NRA should be independent from other government agencies, the authority's political accountability, the design and staffing of the authority, the appropriate role for provincial governments, and the degree to which public participation should be permitted. The answers to these questions will depend upon the regulatory tasks that will be performed. Preliminary observations can be made based on other countries' experience with private power and regulation.

1. Autonomous

The NRA should be structured to minimise opportunities for political interference since the tasks performed are very sensitive. Tariffs recovering the full costs of electric service and minimising cross-subsidisation will confront politically vested interests. Further, the regulatory process will have a significant influence over the use of natural resources, the rules governing competition, and the distribution companies' power procurement and investment decisions. The regulatory process should be insulated from improper influence that skews regulatory decisions in favor of special interests.

There are many ways to shield the regulatory authority from undue political interference. First, the NRA should be completely autonomous from any other government agency or ministry. Second, the regulatory authority should have its own highly professional staff, including lawyers, accountants, economists, and electrical, mechanical, and environmental engineers. Thus, the NRA will not have to rely on the expertise of any other entity and will be able to examine critically information submitted by third parties.

Third, as discussed below, the NRA will be led by a five member commission. To ensure the authority's accountability, these individuals can be elected officials or political appointees subject to potential reelection or reappointment. However, direct election to these positions will likely make the regulatory authority too political, with candidates using their positions at the NRA as a platform for further political advancement, and will not guarantee that the Commission members are professionals with the technical expertise and qualifications needed for these positions.

Appointment is preferable to election, as it removes regulators one step from electoral politics and, therefore, provides some degree of insulation from political pressures. However, to protect against undue influence, the period of appointment should be fixed and made longer than the term for which a government has been elected into office. By structuring the term in this fashion, a government only reappoints commission members if it has received an additional electoral mandate.

Fourth, the NRA will require funding. In most countries, the regulatory authority's budget must be approved by the legislature, even if general taxes are not used as the agency's source of funding. In the United States, for example, the national authority that regulates wholesale tariffs and the licensing of hydel facilities is entirely funded through user fees imposed on the companies subject to

[1] *The environmental consequences of projects must be taken into account in making decisions about resource management. As such, environmental review and regulation should be institutionalised, but need not be made the responsibility of the NRA. This could be accomplished in a variety of ways including the specification of environmental standards through legislation or through a governmental environmental authority. However, it would still be advisable for the NRA, in balancing the competing uses of natural resources, to take into account environmental consequences. This could be accomplished by having the NRA solicit the views of those within the GOP responsible for environmental regulation.*

55

that agency's regulatory jurisdiction. Nonetheless, the revenues from the user fees are deposited in the national treasury and the budget of the agency must be approved annually by the U.S. Congress Similarly, a process that provides for accountability and yet minimises the opportunities for politica interference must be developed.

2. Commission Structure

Regulatory authorities fall into two different management structures: commissions and single administrators. In the case of the former, agency decisions are made by a group of individuals who render judgments by majority vote. In the latter case, agencies are managed and decisions made by a single individual. Commissions and agencies run by single administrators operate very differently from each other. There are advantages and disadvantages associated with both approaches, although the commission structure best suits the needs of Pakistan.

A single administrator is viewed as more efficient than a commission. A single administrator has greater control over the agency's staff, is able to render decisions more expeditiously, and is viewed as able to handle difficult political issues more decisively.

On the other hand, commissions are more politically neutral and less susceptible to improper influence and political interference. Commissions can range in size from as few as three to as many as nine or more members. Members are generally required to be of different political affiliation, with staggered terms of service. Commissions are particularly popular for the regulation of industries involving a high degree of controversy, where interested parties are uncomfortable leaving judgments to the predilections of one individual.

There is at least one other advantage to a commission. The regulation of the PPS will involve a number of difficult technical, engineering and economic issues. A commission structure puts the regulatory responsibility into the hands of a number of individuals, each of whom should bring technical expertise to the decision-making process. Further, the involvement of more than one individual also allows each commissioner to develop a greater depth of knowledge. These advantages can be strengthened through a requirement that commission members have a technical background relevant to the responsibilities of the NRA.

These factors are often cited as support for the proposition that commissions render better quality decisions than do single administrators, and the Advisory Team suggests that the commission structure is appropriate for Pakistan. Admittedly, commissions may be less efficient than single administrators. However, there are organisational designs and management techniques available to address the most obvious administrative problems. A strong chairman with the authority to hire and fire staff strengthens the commission's control over its staff and improves efficiency.

The commission for Pakistan will be composed of five members. A larger commission prolongs decision making, diffuses individual commission members' responsibility, and makes meaningful dialogue among members difficult. Conversely, a smaller commission will limit the amount of technical expertise that can be brought to bear in making decisions and will increase the opportunities for improper influence or interference.[32]

3. Technical Staff

The effectiveness of the NRA will depend on the quality of its staff. The NRA must have its own, highly professional staff that is able to monitor, understand and critique developments as they occur in the PPS. This will require the wide array of technical expertise noted above. The NRA must be able to review tariffs, understand the characteristics of a competitive market, and have a firm grasp

[32] *For an industry as complex as the PPS, more than three members is advisable to ensure sufficient depth of expertise on the Commission. Newly appointed Commission members always require a period of time, perhaps as much as a year, to learn how the Commission operates and understand the issues then pending before the Commission. A five member Commission ensures continuity of expertise and a larger pool of expertise.*

56

of the unique characteristics of the electric utility industry. The presence of a highly motivated, professional staff will be essential, not only to protect against undue political interference, but also to prevent the regulatory authority from becoming a captive of the industry it regulates. To facilitate the effectiveness of the NRA in its early years of operation, technical consultants to both the Commission and its technical offices should be financed by the World Bank, Asian Developme Bank, or other sources.

The cost of the regulatory staff may be reduced by making the NRA responsible for more industri than just the PPS. The principles that govern regulation are not unique to any one industry. Although the engineering aspects of the PPS are particular to the electric utility industry, the legal economic and accounting expertise necessary to regulate the PPS can also be used to regulate othe newly privatised industries. Many regulatory authorities, at least in the United States, are responsible for regulating more than one industry. For example, state public utility commissions ar often responsible for regulating electric, gas, telephone, and transportation utilities, as well as the banking and securities industries.

4. Federal Authority

The division of regulatory authority between federal and provincial authorities raises difficult and politically sensitive issues. Obviously, provincial authorities may want to maximise their control ove distribution companies and natural resources. The design of the regulatory structure must be sensitive to these interests.

On the other hand, the goal of a privatised PPS is to create a competitive, national PPS that, to the greatest degree possible, is insulated from political interference. Further, experience in other countries indicates that power markets are national in scope and state/provincial regulation often results in parochial interests dominating national interests. This is not a surprising result as investments in the power sector create benefits that extend beyond the borders of any one political entity or jurisdiction.

Accordingly, the approach that should be explored initially is to vest the NRA with the ultimate authority to regulate all aspects of the PPS that require regulation, but to create a regulatory proces that will ensure that the provincial governments' interests and opinions are fully incorporated into the NRA's decisions. This can be accomplished with varying degrees of influence and/or control being ceded to the provincial governments, ranging from giving the provincial governments an opportunity to comment on proposed regulatory action to affording such governments a veto right. This issue needs to be explored fully by the GOP since the division of regulatory authority between federal and provincial authorities will have a significant impact on all aspects of the PPS.

5. Public Participation

Finally, there is the issue of public participation. The argument favoring public participation is that regulatory action will be more acceptable to market participants if they have had an opportunity to participate in the process. Although the validity of this argument is difficult to prove, public participation in all aspects of government, including regulation, is consistent with the tenets of democratic societies.

However, it is also clear from experience in other countries that certain forms of public participation, notably formal litigation before adjudicatory tribunals, involve significant time and resources, and may contribute little to the quality of regulatory authorities' decisions. This experience indicates that public participation in the regulatory process must maximise the value of such participation while minimising its disruptive effects and delays in the regulatory decisions.

C. Creation of National Regulatory Authority

The GOP cannot create an effective regulatory authority quickly, but this should not pose a problem during the initial st ges of the PPS' transformation. In the first year or two, the primary focus of reform will be on reorganising WAPDA, improving the process for soliciting new generating capacity, designing new pricing and market arrangements, and privatising discrete, commercially viable assets. None of these activities require strong regulatory scrutiny. WAPDA will continue to procure new capacity, with the involvement of the Private Power Cell of the Ministry of Water and Power. Power purchased from newly privatised generation assets will be pursuant to long-term contracts with fixed rates. This situation will change as the distribution and transmission/despatch companies begin to act independently from WAPDA, the long-term contracts are renegotiated, and a competitive wholesale power market develops.

The GOP should take advantage of this transition period by creating a regulatory authority as quickly as possible — certainly no later than year end 1993. The NRA will serve an important role in implementing the Transition Plan, and the experience gained by creating the NRA will help ensure the availability of seasoned regulatory staff as the privatised PPS matures. Most importantly, private investors will only be willing to embark on substantial investments in the PPS if an independent regulatory authority has been established with clearly delineated authority.

6

THE IMPLEMENTATION PROGRAMME

The GOP can and should take significant steps toward privatisation immediately. Implementation of the competitive, private Pakistan power sector described in Chapter 4 will require a phased-in transition that will take many years. As explained in Chapter 4, the transition plan envisions four overlapping phases, characterised by increasing degrees of decentralisation, private ownership and market competition. During each phase WAPDA and the GOP must undertake a specific programme of action in order to move to the next phase.

This chapter details this implementation programme and outlines a schedule for completing each phase. The government should recognise that these dates are targets that may need to change. The GOP will be able to reevaluate the progress of its privatisation initiative at each step of the transition programme, enabling mid-course corrections or, even, dramatic redirection, if warranted.

Phase I: Initial Planning (Completed by December 1992)

This phase primarily involves preparation and adoption by the GOP of this Strategic Plan, preliminary work leading to the privatisation of the Jamshoro Power Corporation, preparation for corporatisation of the Faisalabad Area Board, development and implementation of a competitive bidding programme for new generation and preliminary work on the design of the National Regulatory Authority.

Task I.1: Develop and Adopt Strategic Plan

This Strategic Plan has been developed by the Advisory Team, in consultation with WAPDA.

Task I.2: Prepare Jamshoro Power Corporation for Privatisation

WAPDA will create a wholly-owned subsidiary, the Jamshoro Power Corporation (JPC), which will acquire the Jamshoro power plant from WAPDA. Following this transaction, WAPDA will sell stock in JPC either as a private placement or as a tender offer directly to the public. The work performed during Phase I will depend in part upon how JPC is to be sold to the public. For example, a private placement can result in potential investors becoming directly involved in the negotiations of the transaction documents between WAPDA and JPC.

The GOP should take steps to enhance the value of this plant. These include: (1) requiring WAPDA to enter into an operations and maintenance agreement with an operator of international repute prior to the transfer of the asset from WAPDA to JPC; (2) protecting private investors from risks associated with the plant's operation that are inconsistent with WAPDA's desire to sell the plant "as is," by means such as by providing performance guarantees and/or a maintenance cost cap, and reduced or limited penalties for non-compliance with the operation requirements of the Power Purchase Agreement during the first several years of JPC's operation of the Jamshoro facility; and (3) evaluating the advantages of delaying the sale of JPC until it has demonstrated an attractive commercial performance record. Further, owing to the critical need to privatise the first thermal plant successfully, the GOP and WAPDA may wish to prepare for privatisation a second, smaller generation plant that is located in a more stable business environment.

Task I.3: Develop a Labor Transition Programme

During Phase I, GOP and WAPDA will develop the Power Sector Labor Transition Programme. This Programme will allow the transition of ownership and operation from WAPDA to the private sector in a manner that provides adequate management flexibility to the private sector owner while assuring the WAPDA work force of ongoing employment opportunities. The Task will involve reviewing existing labor agreements and benefits and retirement programs, and a consideration of the approaches used in other privatisation programmes in Pakistan and elsewhere.

Task I.4: Begin Preparation of Faisalabad Area Board for Corporatisation

During Phase I, preliminary work for corporatising the Faisalabad AEB will begin with a definition of its management structure and assets, and identification of the tasks to be performed in Phase II to establish the Faisalabad AEB as a distinct and autonomous business entity .

Task I.5: Implement a Competitive Solicitation Process

During Phase I, the GOP and WAPDA will develop a competitive solicitation process for private power to replace the GOP's current process of relying on unsolicited proposals, with the objective of encouraging additional private investment in new generating capacity. Until a wholesale market is in place, WAPDA will function as a monopoly power purchaser and reseller. Eventually, AEBs and, perhaps, larger consumers, will be able to contract directly with generators, and the initial WAPDA contracts can be assigned to AEBs. As long as no more than a few, moderate sized projects are undertaken by WAPDA, the resulting contracts will not significantly interfere with the transition to or eventual operation of the competitive, private PPS. Also, WAPDA and the distribution companies will learn a great deal about the private power contracting business.

The principal elements of an effective, competitive solicitation process for WAPDA will need to include:

- Clear definition of the process, timetable, and evaluation criteria and methods;
- Procedures that ensure a competitive solicitation and objective selection of successful projects;
- dentification of the desired type of generation unit, with minimum specificity to enable bidders to have maximum flexibility in project design;
- Identification of potential sites appropriate for power projects;
- An approach to project/bid evaluation that focuses on the price, availability, and reliability of the offered power, rather than on rate-of-return and other technical details typically of concern to the GOP if it were to own and operate the projects itself;
- Elimination of unnecessary redundancy among GOP ministries in the review of project proposals; and
- A demonstrated commitment to accept the results of competitive solicitations within pre-specified participation criteria.

A competitive solicitation consistent with the above criteria can promote a more attractive business climate for private investment. However, to attract private sources of capital, the GOP should alter its method of evaluating power proposals, particularly its focus on return on equity. The GOP and WAPDA should focus instead on the quality of company management, the projected reliability and availability of the power source, and the attractiveness of the price relative to realistic alternatives. Also, the GOP must establish confidence among private investors that good proposals at competitive prices will be accepted.

Several different approaches to competitive solicitations are being used with success around the world, which can serve as models for Pakistan. The objective of this task during Phase I will be to tailor such a solicitation programme to the needs and characteristics of Pakistan. These solicitations will be issued during Phase II.

Task I.6 Design of Regulatory System

Analysis of the regulatory alternatives begins in Phase I. This work will define the regulatory tasks required by the proposed structure of the PPS, evaluate existing laws and regulations applicable to the PPS, draft legislation to create the authority, and assess the options available for the NRA to achieve its regulatory objectives.

Phase II: Initial Privatisation and Detailed Planning (July 1992- July 1994)

Phase II will begin in July 1992, although work related to these tasks will begin in Phase I. Phase II must be successful to provide momentum and credibility for the privatisation programme, even if some early deadlines need to be extended. The consecutive phasing of activities in Phase II needs to conform with the Strategic Plan. For example, continuing to sell portions of WAPDA's generation assets (beyond the first thermal plant) with long-term power purchase agreements prior to enacting market mechanisms and establishing regulatory procedures will make it harder to establish these arrangements. Phase II will continue for approximately twenty-four months and will include the following principal tasks.

Task II.1: Fully Privatise One Thermal Plant and Corporatise One Area Board

Privatisation of one thermal plant (presumably Jamshoro) and corporatisation of one AEB, e.g., Faisalabad, or a part thereof, should be completed during Phase II. The initial privatisation efforts are critical to maintaining the credibility and political viability of the entire privatisation programme. They must be widely perceived as yielding value to the GOP. The principal subtasks, which must be accomplished consecutively to meet this objective, include:

(a) Privatisation of Jamshoro (contingent upon availability of Financial Advisor by mid-1992)

- Establish a corporate entity (completed in Phase I).
- Establish power purchase, fuel contracts, and other transaction documents with advice of financial advisor.
- Establish commercial accounts and a balance sheet and conduct detailed financial modelling and analysis.
- Demonstrate commercial operation of the facility, preferably by bringing in outside O&M contractors.
- Choose a privatisation strategy, e.g., private placement versus tender offer directly to the public, including an assessment of selling JPC to WAPDA employees.
- Confirm/obtain legal authority to sell the assets (completed in Phase I).
- Issue a public stock prospectus and/or negotiate a trade sale.
- Float the stock or close the deal.

(b) Faisalabad AEB Corporatisation

- Define the operations and governance of the corporation.
- Establish and operate a separate WAPDA division/profit center.
- Value the corporate assets and liabilities.
- Establish commercial accounts and a balance sheet.
- Define transfer pricing and subsidy responsibilities.
- Prepare corporatisation documents.
- Corporatise the entity.

Creation and privatisation of viable business units from the several parts of WAPDA will require major changes in organisation, personnel, accounting and reporting procedures, etc., particularly for the AEBs. Financial records and accounting procedures will have to be disaggregated from WAPDA's finances. Any accounts in arrears will have to be allocated, if possible, and outstanding financial obligations must be assigned. Initially focusing on the corporatisation and privatisation of one generation plant and one AEB will provide experience for the broader effort to reorganise and privatise WAPDA as outlined in Tasks II.2 and II.3.

Two years of intensive effort were required to convert the UK Area Boards, which already existed as separate units with independent management, accounts and pricing, into businesses suitable for public flotation. Corporatisation of WAPDA's business activities will be far more complicated. Given the GOP's timetable, it may be possible to short-circuit some of what was required in the UK by giving the shares in the distribution companies to customers, as is being proposed in New Zealand. The process must not be rushed by unrealistic deadlines, which will result in operational problems and "fire sale" prices that will discredit the privatisation process. Therefore, privatising one thermal plant and corporatising one AEB as a distinct and autonomous business entity will be significant successes if completed during Phase II.

Task II.2: Decentralise and Restructure WAPDA into Business Units

Before the remainder of WAPDA can be privatised, it will be necessary to decide on a rational restructuring of WAPDA into separate business units. This process will entail definition of responsibilities and governance; organisation of accounts, asset values and balance sheets; determination of transfer pricing; etc. The business units defined during Phase II must reflect the desired long-term structure of the PPS outlined in Chapter IV: several thermal generation companies; at least one hydroelectric company (probably WAPDA or a subsidiary); several distribution companies with separate distribution and electricity supply divisions or businesses; and a transmission company with separate divisions to own, operate, or maintain the grid and to manage the despatch/market-making functions.

Deciding how the AEBs will operate is one of the most important tasks. There may be alternative configurations to their current structure that will better promote the objectives of privatisation and enhance the economic viability of the AEBs. For example, perhaps the principal urban areas should be treated as distinct companies, while the rural areas are combined into one or two subsidised rural electrification authorities. Much of the success of privatisation will depend upon the creation of economically viable distribution companies with government subsidies kept to a minimum and made transparent.

At a minimum, in Phase II the GOP should identify the appropriate business units and establish them as separate WAPDA divisions. It should also identify management of the business units, even

before corporatisation, and establish appropriate incentives, such as bonuses related to profits or sales price. Even if the GOP decides not to corporatise or privatise these functions, the separation of activities into discrete business units will facilitate cost tracking and accountability, and the creation of profit incentives will result in improved efficiencies.

Task II.3: Corporatise WAPDA as a Holding Company with Operating Subsidiaries

Once the appropriate business units are identified, the process of corporatising WAPDA as a holding company with operating subsidiaries (similar to the process described in Task II.I) can begin. Corporatising WAPDA and its operating subsidiaries will enhance managerial autonomy, codify the respective responsibilities of WAPDA's business divisions, encourage attentiveness to cost tracking, and increase accountability. These advantages should occur irrespective of whether WAPDA or any of its subsidiaries are privatised. However, corporatising WAPDA in this form will facilitate such privatisation.

Task II.4: Develop Commercially Viable Retail Pricing/Subsidy Policies

Developing viable pricing and subsidy policies will be one of the most important and difficult parts of the transition process. WAPDA's current accounting procedures and pricing policies result in nationally uniform prices that are too low on average and certainly too low during times of shortage.

During Phase II, the GOP must develop a programme to allow prices to move toward economically and commercially viable levels and structures. Eventually, the current nationally uniform retail tariffs will be replaced by a system of wholesale power prices (either a WAPDA bulk supply tariff or wholesale market prices) plus add-ons to cover distribution and other retail-related costs. Thus, retail tariffs charged by the AEBs and successor distribution companies will reflect the specific cost-of-service of individual AEBs, rather than the average cost of the entire PPS.

If differing, cost-based retail prices are regarded as socially unacceptable, the GOP must implement explicit subsidy arrangements, at least for a transition period, without undue distortions in retail prices or financial strains on the entities which administer the subsidies. This is best done through contracts that provide price protection to the identified groups by guaranteeing them a certain amount of power at a low price, while requiring incremental power to be traded at economically efficient prices with the GOP directly compensating the distribution companies for the provision of subsidised power. The government will have to define such contracts and subsidies before privatisation goes too far, both because premature privatisation will make it more difficult to put such contracts into place and, more importantly, because social and political opposition may make significant privatisation impossible without such arrangements. Full implementation of these contracts and subsidies will not be necessary until Phase III, but the contract forms and preliminary tests should be developed during Phase II.

Task II.5: Design and Implement Preliminary Electricity Market Arrangements

Decentralised, efficient operation of an integrated electricity system and, hence, effective competition are not possible without some sort of formalised wholesale pooling or market arrangements. Such a market must, at a minimum, provide for generators to be centrally dispatched to meet system demand at least cost, with compensation payments made among generators to share the benefits. Initially, this market may be no more than a set of non-discriminatory back-up and buy-back arrangements based on system marginal cost and incremental capacity values. Until such arrangements are in place, direct contracts between power suppliers and AEBs or consumers will not be practical. However, the ultimate structure of the PPS will require a more sophisticated market.

The GOP should determine the most appropriate market arrangements for the PPS by gathering operation and planning experts from various government ministries, e.g., WAPDA, Ministry of Water & Power, NRA, who, assisted by advisors with experience in the development of such markets elsewhere, will develop the concepts to produce a workable electricity market in Pakistan. Definition and preliminary implementation of such a market, including both capacity and energy trading, will be the objective of this Phase II activity, with evolution of the ultimate market to take place during Phase III.

Task II.6: Solicit and Contract Private Power Projects

The GOP will use the competitive solicitation process developed during Phase I to identify and contract private power projects.

Task II.7: Define/Develop Regulatory System

From the outset, the regulatory structure must be defined in broad terms, so that it can be properly reflected in the solicitation process and in the contracts needed for privatisation. During Phase II the regulatory tasks and structure of the NRA will be finalised, the NRA will be created and staffed regulations will be promulgated, and the NRA will begin to become involved in the regulation of the PPS, including helping to develop commercially viable pricing policies and electricity market arrangements. Chapter 5 identifies many of the issues that must be resolved in Phase II.

The exact role that the NRA will ultimately serve in the PPS cannot be finalised until later Phases when the workings of the market become known. For example, once all of WAPDA's thermal generation is privatised during Phase III and Phase IV, competition should discipline the prices generators charge. However, competition may not develop quickly, and regulatory arrangements may be required to control generators' prices, although the initial contracts will control generator prices, thereby protecting consumers for the term of these contracts.

Phase III: System Testing and Finalisation (August 1994 - August 1996)

Phase III, which should begin in mid-1994 and continue for two years, will be defined more fully during Phase II. The principal objective of Phase III is to test and refine the concepts developed during Phase II, while WAPDA remains in effective control of system operations. This test period will allow problems to be identified and solved without endangering system operations. Phase III will include the following principal tasks.

Task III.1: Test and Refine Wholesale Electricity Markets

The pricing and trading concepts for the energy and capacity wholesale markets will be further refined.

Task III.2: Refine Tasks and Responsibilities of the National Regulatory Authority

The NRA, created during Phase II, will become fully operational.

Task III.3: Negotiate and Implement Contracts for Existing Capacity

Energy and capacity contracts for existing generators will be defined and negotiated in Phase II and early in Phase III. These contracts will essentially be between the generators and distribution

companies (or large industrial and commercial customers). For thermal units, most such contracts will be with the distribution companies and large consumers and will underwrite the financing of the power plant purchase. The contracts will protect customers and generators from most of the uncertainty of the wholesale power market, while allowing such a market to provide the short-term price signals necessary for system efficiency.

Task III.4: Implement Retail Pricing/Subsidy Policies

The AEBs and distribution companies, if any have been privatised, will begin to implement the policies and tariffs developed in Phase II.

Task III.5. Privatise Selected Generation Plants and Area Boards

During the initial stages of Phase III, the corporatisation of the separate business units identified in Phase II will be completed and operation as independent business entities will begin. Selected privatisations will continue, but will generally occur only after the corporatised entities have established viable commercial performance records. Thus, early in Phase III the rate of privatisation is expected to slow. However, most of the assets scheduled for privatisation will be sold or be ready to be sold by the end of Phase III. Certain entities, such as the AEBs responsible for serving predominately rural and the frontier areas, may take longer to privatise. In some cases, to achieve the efficiencies of privatisation, the government may have to encourage private ownership of these AEBs by paying direct subsidies reflecting the shortfall between the costs of providing electricity services and the expenses that can be recovered through tariffs.

Task III.6: Define Grid/Despatch/Market Arrangements

The transmission grid and the despatch/market-making functions should ultimately be separated from WAPDA as one or even two private entities. However, the precise form of ownership is not critical, as long as effective separation is maintained between these monopoly "service" functions and ownership of any generation, as long as the grid and the despatch/market functions are responsive to the needs of the generators, distribution companies, and large industrial users who will use and ultimately pay for the grid and the market.

Phase IV: Full Implementation (1996 onward)

In Phase IV, the PPS will begin to operate as a competitive, largely privately-owned industry. Any commercially viable thermal plants or AEBs not previously privatised will be corporatised or privatised. As the initial contracts expire, the distribution companies and generators will recontract on their own and the distribution companies will solicit contracts with new generators. The new generators may include private thermal and smaller scale hydel generators, as well as any new WAPDA hydel projects that the GOP approves because their non-power benefits make them economic, even though private generators will not undertake them. WAPDA will be precluded from building new thermal generation.

The roles of the distribution companies and the NRA will evolve over time. Initially, the distribution companies' service franchise for power sales should be exclusive, at least with regard to residential, commercial, and small industrial customers. As such, the distribution companies' sales to their retail customers will have to be regulated. Also, the embryonic nature of competition will require the NRA to monitor the competitiveness of the electricity market and, absent competition, wholesale power sales will also have to be regulated.

Once the PPS becomes fully competitive, the role of the NRA in regulating prices for wholesale and large retail consumers will become more limited. Competition to serve retail customers may be introduced and, over time, expanded to allow distribution companies to be relieved of their obligation to serve as power supplier to many, if not most, classes of retail customers, although the distribution companies will always have an obligation to provide "wire" services. Regulation will be limited to transmission and distribution "wire" services, maintaining the competitiveness of the PPS and ensuring that subsidised services are provided.

The ultimate structure and operation of the PPS will be determined by a number of factors that cannot be determined accurately at this time. These will more properly be addressed by the GOP, the NRA, and the various participants in the PPS as the industry moves through the transition period. All parties will have to work cooperatively together. The GOP and the NRA will have ultimate responsibility to assess the progress of privatisation and to decide what steps, if any, should be taken to take full advantage of the opportunities presented by private ownership of the PPS.

66