

A Report to the Operations Evaluation Department  
Asian Development Bank

For the Country Assistance Program Evaluation for Pakistan

# Evaluation of the Power Sector Operations in Pakistan

by  
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## ABBREVIATIONS

ADB	—	Asian Development Bank
GDP	—	gross domestic product
IPP	—	independent power producer
KESC	—	Karachi Electric Supply Corporation
MTDF	—	Medium Term Development Framework
NEPRA	—	National Electric Power Regulatory Authority
NTDC	—	National Transmission and Despatch Company
PEPCO	—	Pakistan Electric Power Company (Private) Limited
PCR	—	project/program completion report
PPA	—	Power Purchase Agreement
PPIB	—	Private Power and Infrastructure Board
RRP	—	report and recommendation of the President
TA	—	technical assistance
WAPDA	—	Water and Power Development Authority

## NOTE

In this report, "\$" refers to US dollars.

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## I. INTRODUCTION

### A. Background

1. This report, prepared for the Operations Evaluation Department (OED) of the Asian Development Bank (ADB), presents the findings of a review of ADB's activities in the power sector in Pakistan since 1990.<sup>1</sup> The start date reflects substantial changes in the Pakistan power sector in the early 1990s, when there was a move from public sector provision to a mixed model with public and private sector components. The review aims to provide an independent assessment of ADB's assistance to the sector, its impact on sector development and on a wider scale, and its impact on the country's economic development and poverty alleviation. It also seeks to identify lessons and areas where the Government, ADB, private sector, and other stakeholders can work together more effectively to achieve the ultimate goal of providing electricity at an affordable cost, and developing an efficient and financially viable power sector. It is part of the work undertaken for the Pakistan Country Assistance Program Evaluation (CAPE), which will in due course support the formulation of a new Pakistan Country Strategy and Program (CSP) to be approved in 2006.

2. The evaluation is focused not just on the projects and technical assistance (TA), which ADB funded, but on the entire energy sector. It is conceptually not possible to evaluate the impact of ADB's assistance without examining the performance of the power sector as a whole. This is because ADB's assistance was not undertaken in isolation but was accompanied by investments and TA from other multilateral and bilateral financing institutions, e.g., the World Bank, Japanese Bank for International Cooperation (JBIC), Kreditanstalt für Weideraufbau (KfW), and by the Government. Their activities have a crucial impact on the performance of ADB's contributions.

### B. The Pakistan Power Sector

3. Pakistan had gross domestic product (GDP) per head of \$637 in 2004. It has one of the least developed power sectors compared to other countries in Asia. Table 1 provides some key electricity indicators for selected countries in the Asia Pacific region (see Appendix 1 for further details). Electricity consumption per head in Pakistan is below the level of countries such as India and Indonesia but ahead of Vietnam and Sri Lanka (and Bangladesh, Cambodia, and Nepal, which are not included in the table). The level of household electrification, at 55%, is below that in Sri Lanka and Vietnam. The share of new and renewable energy in capacity is particularly high in Pakistan, reflecting the successful exploitation of the country's hydroelectric capacity. Tariff levels are comparatively low.

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<sup>1</sup> The review was carried out by David Parish and Shahid Ahmed in June 2005.

**Table 1: Cross-Country Comparison Electricity Indicators for Asia Pacific, 2000–2002**

Country	Installed Capacity per Capita (kW)	New and Renewable Energy Share of Capacity <sup>a</sup> (%)	Ratio Between Maximum Demand and Installed Capacity	Electricity Consumption per Capita (kWh)	Electricity Intensity in GDP (kWh/\$)	Electricity Loss <sup>b</sup> Per Unit Generated (%)	Electrification Rate <sup>c</sup> (%)	Household Electricity Tariff (US Cents/kWh)
Australia	2.16	21	81	9,652	0.40	7	100	6.97
Bhutan	0.17	1	25	222	0.41	3	5	1.03
Hong Kong, China	1.69	—	80	5,612	0.22	12	100	13.99 <sup>d</sup>
India	0.11	—	—	357	0.73	26	88	3.54 <sup>e</sup>
Indonesia	0.11	16	—	382	0.64	—	82	—
Japan	2.00	8	67	6,479	0.14	4	100	17.33
Malaysia	0.64	14	66	2,693	0.79	10	97	6.58 <sup>f</sup>
Mongolia	0.32	0	—	785	1.87	18	24	4.62
Pakistan	0.11	67	67	310	0.60	24	59	5.18
Papua New Guinea	0.11	38	—	147	0.18	0	45	5.35
Philippines	0.18	32	54	488	0.40	16	78	13.05
Singapore	1.70	0	—	7,454	0.27	3	100	8.34
Sri Lanka	0.10	63	76	276	0.34	21	68	5.35
Thailand	0.45	17	62	1,589	0.34	7	99	6.38
Viet Nam	0.08	55	74	269	0.73	16	80	5.87

— =not available.

<sup>a</sup> New and renewable energy includes geothermal, hydropower, solar PV, wind, combustible renewables and waste, and fuel cells.

<sup>b</sup> Electricity loss is the ratio of transmission and distribution losses to the total electricity generation.

<sup>c</sup> Electrification rate is calculated as the ratio of total urban and rural population with access to electricity to total rural and urban population of the country.

<sup>d</sup> Tariff of Hong Kong Electric Company Ltd.

<sup>e</sup> Tariff in Rajasthan.

<sup>f</sup> Tariff of Tenaga Nasional Berhad (Peninsula Malaysia).

Source: United Nations Conference on Trade and Development.

4. The installed capacity of the system as at June 2004 is shown in Table 2.

**Table 2: Installed Capacity of the System**

Fuel	Total (MW)	Available (MW)
Thermal	12,567	10,592
Hydro	6,493	4,727
Nuclear	462	360
<b>Total</b>	<b>19,522</b>	<b>15,679</b>

5. The breakdown of capacity by operator as at June 2004 is shown in Table 3.

**Table 3: Breakdown of Capacity**

<b>Operator</b>	<b>MW</b>
WAPDA	11,297
KESC	1,756
IPPs	6,007
Nuclear	462
<b>Total</b>	<b>19,522</b>

6. The breakdown of demand by consumer category is shown in Table 4.

**Table 4: Breakdown of Demand**

<b>Consumer Category</b>	<b>Percentage</b>
Domestic	43
Industrial	30
Commercial	6
Agriculture	11
Other	10
<b>Total</b>	<b>100</b>

7. The past 15 years have been a period of significant change in Pakistan's power sector. A brief chronology of key events over this period is attached as Appendix 2. In 1990, the sector was dominated by two integrated public utilities: the Water and Power Development Authority (WAPDA), a government-owned statutory body, and the Karachi Electric Supply Corporation (KESC), a public limited liability company in which government has a controlling interest. Structural reform was under consideration from the early 1990s. Significant change began in 1994 when a new power policy permitted the development of private independent power producers (IPPs), selling electricity to both WAPDA and KESC under power purchasing agreements (PPAs).

8. The IPP contracting was overseen by the Private Power and Infrastructure Board (PPIB), which is an implementing agency for energy policy. The PPIB was set up in 1994 to provide a one window facility for investors in the power sector. It negotiates, executes and administers agreements with IPPs and provides an interface between IPPs and government.

9. The IPP policy was originally designed to address a shortfall of about 1,500 megawatt (MW) in generation capacity at a time of tight constraints on public expenditure. It succeeded in attracting both foreign and local investors into the sector. However, the authorities continued to contract further IPP capacity beyond the required level and as a result capacity outran demand. Over 3,000 MW of private IPP capacity came on stream in 1997 alone. Maximum demand fell from 84% of capacity in 1994 to 64% in 1998. Some reduction in this ratio was desirable in order to enhance system reliability and reduce the incidence of power cuts. However, power demand growth stalled following the Asian financial crisis, exacerbating the excess capacity problem. Under the payment mechanism of the PPAs, monthly capacity payments consisting of debt service, fixed operations and maintenance (O&M) costs, insurance and return on equity on an internal rate of return basis were assured even if no electricity was purchased. In addition IPPs received payments for energy purchased on a per unit energy charge basis. Payments were guaranteed by the Government. There were a number of disputes with IPPs in the late 1990s

when government tried to reduce costs through tariff reductions. A more detailed description of government policy is in Appendix 3.

10. Government adopted a policy of unbundling for the power sector, which was enshrined in the 1997 NEPRA Act and the 1998 WAPDA Act. This involves separating responsibility for energy sector policy (which remains with the Government), from regulation of the sector (which has been passed to the National Electric Power Regulatory Authority [NEPRA]) and operations, which are being divided among generation, transmission, and distribution companies.

11. There are three parts to the regulator's mission:

- (i) To ensure safe, reliable, efficient, and affordable electric power to the electricity consumers of Pakistan.
- (ii) To facilitate the transition from a protected monopoly service structure to a competitive environment.
- (iii) To maintain a balance between the interests of consumers and service providers.

12. In discharge of this mission, the regulator sets performance standards and lays down rules for generation, transmission, and distribution. It issues licenses to the entities responsible for generation, transmission, and distribution and approves tariffs at the retail level and between sector entities. It should lead to a reduction in political interference in the power sector, especially in tariff decisions.

13. As part of the unbundling process, WAPDA has been separated into a number of entities responsible for generation (four generation companies), transmission (the National Transmission and Despatch Company) and distribution (nine distribution companies). The process of separating out the various entities and corporatization is still in progress. Pakistan Electric Power Company (Private) Limited (PEPCO), a separate agency within WAPDA, is responsible for this restructuring and preparation for privatization. It is planned to privatize the generation and distribution companies in due course through the Privatization Commission but efforts to date have not been successful.

14. KESC has been privatized, as an integrated utility, by the Privatization Commission. This complex and time consuming transaction, which involved extensive analysis and numerous decisions by the Government and the Privatization Commission, supported by financial advisers and ADB, has been completed successfully. The original purchaser, a Saudi company, Kanooz Al Watan, failed to meet the payment deadline. However, the second ranked bidder, Hassan Associates purchased a 71% stake in KESC on 1 December 2005 to conclude a well thought through and determined privatization process.

15. The Government has recently established an Alternative Energy Development Board, as part of the Prime Minister's Office to oversee development of alternative energy resources such as small scale hydro plants, wind power and off grid generation plants. The Agency is still in the early stages of its work but the government has set ambitious targets for the development of alternative and renewable energy resources.

### **C. ADB's Assistance Program**

16. ADB has a long standing involvement in Pakistan's energy sector, dating back to the 1970s, covering both gas and power. Since the mid-1980s, loans to the electric power sector have totaled \$1,688 million and to the natural gas sector \$454 million. Support has taken the form of loans, equity investments, TA, and policy dialogue on sector reforms. Full details are set out in the next section.

### **D. Methodology of the Evaluation**

17. The evaluation adopted two main approaches:

- (i) Interviews with officials in the main agencies in the Pakistan power sector including the Ministry of Water and Power, the Privatization Commission, PPIB, the Alternative Energy Development Board, NEPRA, WAPDA, PEPCO, KESC, the National Transmission and Despatch Company, the Ghazi Barotha Taraqiati Idara (the nongovernment organization [NGO] managing resettlement issues at Ghazi Barotha), gas companies which supply gas to the power sector, other development partners such as the World Bank and JBIC and various distribution companies and independent power producers.
- (ii) Analysis of information in reports including ADB reports, i.e., reports and recommendations of the President (RRPs), project completion reports (PCRs), TA completion reports (TCRs), project performance audit reports (PPARs), back-to-office reports (BTORs), annual reports, accounts of the utilities, consultants' reports, and reports and studies prepared by other development agencies active in the sector

18. In addition, the mission visited the Ghazi Barotha project and inspected some of the assets, which had been procured with ADB funding.

## **II. EVALUATION OF ADB'S ASSISTANCE PROGRAM**

### **A. Loans and Investments**

19. ADB has a long standing program of investment in the power sector, reflecting the importance of the sector to economic development and growth. The loans, which have been undertaken in the sector since 1985, are shown in Table 5.

**Table 5: Loans Undertaken in the Pakistan Power Sector Since 1995**

<b>Description</b>	<b>Date of Approval</b>	<b>Date of Closure Per Loan Agreement</b>	<b>Actual Date of Closure</b>	<b>Amount Approved (\$ Million)</b>	<b>Amount Disbursed (\$ Million)</b>	<b>Amount Cancelled (\$ Million)</b>
Loan 1073: WAPDA 11th Power	20 Dec 1990	30 Jun 1994	30 Jun 1997	215.0	207.1	7.9
Loans 1143/44: WAPDA 12th Power (Sector)	01 Jun 1992	30 Jun 1998	21 Nov 2000	250.4	253.5	-3.1
Loan 1314/15: KESC 6th Power (Sector)	22 Sep 1994	31 Dec 1998	06 Oct 2003	200.0	75.8	124.2
Loan 1424: Ghazi Barotha Hydropower	16 Jan 1996	30 Jun 2002	20 Jan 2004	300.0	254.5	45.5
Loan 1807: Energy Sector Restructuring Program	23 Nov 2000	31 Dec 2003	19 Jan 2004	300.0	153.0	147.0
Loan 1808: Energy Sector Restructuring Program	23 Nov 2000	31 Dec 2003	14 Dec 2004	50.0	50.4	
Loan 1809: Capacity Enhancement in the Energy Sector	23 Nov 2000	31 Dec 2003	30 Jan 2004	5.1	0.0	5.1
<b>Total</b>				<b>1,320.5</b>	<b>994.3</b>	<b>326.6</b>

KESC = Karachi Electric Supply Corporation, WAPDA = Water and Power Development Authority.

Note: Loans 1808 and 1809 were denominated in SDR and have been converted to US\$ at the November 2000 exchange rate of SDR1 = US\$1.28.

20. In addition, in March 1996, ADB participated in an IPP project, through both a loan and equity investment in the Fauji Kabirwala Power Company.

21. The WAPDA eleventh power project (Loan 1073)<sup>2</sup> was approved in 1990 and put in place to finance transmission, distribution and power factor correction equipment. The scope of works to be funded was changed during the disbursement period to give greater emphasis to transmission. A favorable bid process also enabled extension in the scope of the project. A total of \$207 million of the loan was disbursed and the balance of \$8 million was cancelled. The closing date was extended twice by a total of 34 months because of delays in starting design and bid documents and pressure of work in area boards. The performance of ADB and WAPDA was evaluated as satisfactory. Covenants on system losses and to a lesser extent self financing ratios were not complied with.

22. The WAPDA twelfth power sector loans (Loans 1143/1144)<sup>3</sup> were focused on generation capacity, transmission capacity, grid substations, and associated capacity improvement. A number of projects were considered for funding and the Kot Addu combined cycle plant and the Chasma hydropower plant were eventually selected. The loan amount was \$250 million but it was planned to use the loan as a basis for mobilizing cofinancing for a range of projects. The PCR rated the project as successful despite some significant delays in implementation. The closing date was extended from June 1998 to November 2000. A major cause of these delays

<sup>2</sup> ADB. 1990. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grants to the Islamic Republic of Pakistan for the WAPDA Eleventh Power Project*. Manila.

<sup>3</sup> ADB. 1991. *Report and Recommendation of the President to the Board of Directors on Proposed Loans and a Technical Assistance Grant to the Islamic Republic of Pakistan for the WAPDA Twelfth Power (Sector) Project*. Manila.

was lack of counterpart funds. Conditions on the loans included 18 covenants. Compliance with financial covenants was poor with conditions on debt service cover, self financing, accounts receivable, technical losses, and financial reporting not complied with.

23. The KESC sixth power sector loans (Loans 1314/1315)<sup>4</sup> were designed to give KESC the opportunity to reinforce, rehabilitate, and extend its transmission and distribution system. At appraisal it included various elements to improve transmission, distribution, load dispatch, system protection, telecommunications and computerization, as well as assisting with demand side management and consulting. A \$200 million loan was approved in September 1994 and was designed, with cofinancing, to support total investment of \$678 million. Loan effectiveness was delayed by failure to meet financial conditions. Subsequently, because of a shortage of counterpart funds, only the investment in the transmission system and the consulting services were implemented and this required three extensions to the closing date. The overall project cost was reduced by 80% because of the cancellation and \$113 million of the planned ADB loan was cancelled. KESC did not comply with any financial and operational covenants on the loan which covered reduction in transmission and distribution losses, accounts receivable, debt service coverage and self financing. Transmission and distribution losses, according to KESC records, increased significantly over the period rather than reducing in accordance with the covenants. The loan was rated as partly successful in the PCR.

24. Loan 1424 funded ADB's contribution of \$300 million to the Ghazi Barotha hydropower project, which was a component of WAPDA's least cost development plan for the power sector. This project was cofinanced with the World Bank (\$350 million), JBIC (\$350 million), KfW (\$147 million), the European Investment Bank (\$60 million), and the Islamic Development Bank (\$40 million). The World Bank financed feasibility study work for this project and had overall responsibility for donor coordination during implementation. There were a number of covenants on system losses, accounts receivable, debt service, and self financing which were only partly complied with. In particular, WAPDA's self financing deteriorated considerably in 2000 and 2001 and system losses worsened slightly over the period. The shortages of counterpart funds led to some delays in project implementation. The project is now operational and the draft project completion report rates it as successful.

25. Loans 1807/1808<sup>5</sup> were part of a major program loan designed to support reform in the energy sector and accompanied by TA support through Loan 1809 (footnote 5) in order to help the reform process. The loan was linked to Pakistan's structural adjustment program and arrangements were closely coordinated with the World Bank and International Monetary Fund, which also provided Pakistan with loans at around the same time. The loan was not linked to any power sector projects and the Ministry of Finance was the executing agency, with various power sector institutions responsible for aspects of reform implementation. A wide range of loan conditions was agreed in a six-page letter from the Government along with an 11-page policy matrix. These covered the institutional and financial restructuring of WAPDA and KESC along with the development of the role of the power regulator. The loan was structured in four tranches, including an incentive tranche, with disbursement linked to performance on the reform program.

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<sup>4</sup> ADB. 1994. *Report and Recommendation of the President to the Board of Directors on Proposed Loans and Two Technical Assistance Grants to the Islamic Republic of Pakistan for the KESC Sixth Power (Sector Loan) Project*. Manila.

<sup>5</sup> ADB. 2000. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the Islamic Republic of Pakistan for the Energy Sector Restructuring Program*. Manila.

26. ADB made a private sector investment, both loan and equity, in an IPP. This was the Fauji Kabirwala Power Company. The IPP was developed in concert with local and United States based investors. Out of a total project cost of \$170 million, ADB contributed an equity investment of \$5.3 million, a \$32 million loan and a complementary loan of up to \$65 million. Private banks also provided funding. The project has operated successfully and is repaying loans on time and paying a dividend on its equity. This project exploited an indigenous source of low to medium heat rate gas, which would otherwise not be usable as an energy source, and demonstrated the potential for using such gas for other power projects. The gas field had been developed through an ADB funded Oil and Gas Development Project.

27. Further loans to the power sector are planned for renewable energy development, transmission and distribution. The ADB Board approved, in December 2005, a loan to Pakistan's first hydro IPP project. Further private sector investments, for both hydro and thermal IPPs are under consideration.

## B. Technical Assistance

28. ADB has directly grant funded a series of TA projects for the Pakistan energy sector in recent years. The details are shown in Table 6.

**Table 6: ADB Technical Assistance for the Pakistan Energy Sector**

TA Number	Title	Date Approved	Estimated Cost (\$)
1625	Power Generation Coordination Improvement and Tariff Training	Jan-92	585,000
2162	KESC Restructuring and Privatization Study	Sep-94	300,000
2163	Demand Side Management Study	Sep-94	90,000
2594	Natural Gas Import Study	Jul-96	622,000
2809	Private Hydropower Policy Study	Jun-97	100,000
2525	Power Efficiency Project	Jan-96	950,000
			(lapsed offer) <sup>a</sup>
3409	Capacity Building of the National Electric Power Regulatory Authority	Mar-00	1,472,000
3502	Support for Privatization of KESC	Sep-00	2,060,000
3711	Restructuring the Gas Sector	Sep-01	1,250,000
4130	Institutional Capacity Building of the National Transmission and Despatch Company Limited	Jun-03	750,000
4500	Capacity Building of the Alternative Energy Development Board	Dec-04	150,000

<sup>a</sup> Lengthy delays were encountered in obtaining responses after the TA letter had been forwarded for signing, and as a result the context in which the TA was approved change. The TA approval has lapsed and the Government has been informed. The power efficiency project that would have been formulated under the TA has been dropped from the list of ADB's program of assistance for Pakistan as agreed with the Government.

29. Generally these TAs were carried out to a good standard. The topics they cover demonstrate their close connection to the sector reform program and their outcomes have influenced this program. Discussions with beneficiaries suggest that they obtained value from the advice provided by the TAs.

30. Some TAs were less successful. For example, the outputs from the demand side management study (TA2163) did not materialize because of the cancellation of large parts of the associated loan to KESC. The power efficiency TA, which was included with the Ghazi Barotha project was not taken up by the Government and was cancelled. However, in general,

the Government has been keen to undertake TAs and has demonstrated its commitment through its willingness to provide cofinancing for some of them. For example, half the cost of the support for KESC privatization came from the Government, as did 20% of the cost of the TA for restructuring the gas sector. The Government has also been willing to accept a TA loan (Loan 1809) and contributed \$1 million of the cost of TA projects under this loan.

31. There are TCRs for four of the TAs as shown in Table 7.

**Table 7: TCR Data of Four ADB Technical Assistance**

TA Number	Title	Planned ADB Contribution (\$)	Actual Cost to ADB (\$)	Original Closing Date	Actual Closing Date	TCR Rating
1625	Power Generation Coordination Improvement and Tariff Training	585,000	488,513	Apr-95	Aug-95	Generally Successful
2162	KESC Restructuring and Privatization Study	300,000	239,021	Sep-96	Jun-03	Partly Successful
2594	Natural Gas Import Study	600,000	525,557	Feb-97	Dec-00	Generally Successful
3409	Capacity Building of the National Electric Power Regulatory Authority	1,000,000	947,558	Oct-00	May-03	Generally Successful

Source: Asian Development Bank documents.

32. In several cases, there were delays in completing TAs. However, in general these delays did not prevent the projects from being successful. The delays arose for external reasons such as the events of 11 September 2001 and because governments changed and sometimes took time to complete steps necessary to use the TA effectively. The KESC restructuring and privatization study was rated as only partly successful because of numerous changes to the terms of reference and changes in attitudes to the work by the Government and by KESC as executing agency. Some of the funding was eventually redirected to funding restructuring at WAPDA. However, international experience suggests that gaining commitment to power sector privatization is a time consuming process and hence the delays and changes of approach are perhaps a necessary part of a process that did eventually come on track. Asking an entity to act as executing agency on a project designed to lead to its own privatization is inherently likely to lead to delays.

### C. Policy Dialogue

33. In addition to its financial commitment to the Pakistan energy sector, ADB has also been extensively involved in policy dialogue with the various entities in the sector, particularly government but also agencies such as WAPDA, PEPCO, KESC, the Privatization Commission, and the PPIB.

34. Sometimes aspects of the policy dialogue are documented (for example the 1998 power policy was heavily influenced by ADB advice). But in general it is less well documented than the other aspects of ADB's involvement. However, the dialogue is of critical importance because it is a major part of the way in which ADB has offered its experience and advice to influence the evolution of the policy environment for the sector. For example, in the recent past ADB has been heavily committed to helping in the privatization of KESC and has financed the financial advisers who have assisted in marketing the company to international investors. ADB has been actively involved in the work, which was undertaken and regularly participated in meetings over privatization progress. The dialogue extends to all the main participants in the power sector.

35. The quality and consistency of the policy dialogue has clearly benefited from the continuous long term engagement of a single project officer. Advice and decision making have been consistent over time and founded in a deep understanding of the situation in the country and the sector.

### **1. Assessment of Key Issues**

36. The CAPE is focused on a number of issues relating to ADB's power sector strategy. These are:

- (i) What strategies were pursued for utilizing ADB resources?
- (ii) How were strategic choices made?
- (iii) Were these choices sound in terms of the evidence available (or could have been available through analysis) at the time they were made, and in light of the results of those decisions?
- (iv) What was the relative influence of the various elements of strategy on the ADB's lending program?
- (v) What was the quality of ADB's formalized country strategies?
- (vi) Irrespective of strategy, what was the quality of the program for dimensions to soundness?
- (vii) Were the choices made by those managing the program the right ones for maximizing results attainment?
- (viii) How have the sectors, and their institutions, supported by ADB operations performed?
- (ix) In what ways may ADB resources have contributed to these sector outcomes, or not as the case may be?
- (x) Was there effective synergy between ADB resources and those of others?
- (xi) How can choice selection and decision making processes be improved in the future?

37. The evaluation of performance is set out below under these headings.

### **2. What Strategies Were Pursued for Utilizing ADB Resources?**

38. Since the introduction of the 1994 government power policy, which marked a watershed in power sector planning in Pakistan, ADB has pursued four broad strategies in the sector. These are:

- (i) To minimize costs and improve governance and efficiency in the sector and ensure financial viability. Reducing the level of system losses in the transmission and distribution system, arising through both theft and technical factors, has been a continuing focus of ADB.
- (ii) To support sector unbundling, corporatization, independent regulation, and private investment in power. In this respect, ADB was both developing and helping to support what has become an international consensus about the best approach to power sector structuring.
- (iii) To promote the use of indigenous fuel and renewable energy resources. Pakistan has indigenous gas reserves which are used for power generation as well as substantial hydroelectric capacity. ADB is now at the forefront in supporting renewable energy resources.

- (iv) To be selective in the institutions and activities that received support. In particular, ADB has taken leadership in supporting KESC through a working relationship which dates back to 1972. The World Bank has played a similar role with WAPDA.

### **3. How Were Strategic Choices Made?**

39. ADB has made its choices about projects and strategies to support for a variety of reasons. The most important are:

- (i) Past program decisions. ADB's commitment to working with KESC dates back as far as 1972.
- (ii) Support for an international consensus on restructuring and development of the power sector. The move away from publicly owned integrated power utilities to an unbundled industry structure with a power sector regulator and separate entities responsible for generation, transmission and distribution has been a theme of power sector reform in many countries around the world. ADB has both participated in the development of this policy and supported its implementation. ADB's policy paper on energy,<sup>6</sup> published in 1995, places considerable emphasis on restructuring power utilities and attracting private sector investment. This is reiterated in the revised policy paper, published in 2000.
- (iii) Opportunity. The Ghazi Barotha project in particular required participation from a number of donors because of its size, complexity and cost. The World Bank took the overall lead among development partners at both the feasibility study stage for the project and in its implementation. ADB became involved as a lender because the project provided a least cost solution to meeting future generation capacity needs.

### **4. Were these choices sound in terms of the evidence available (or could have been available through analysis) at the time they were made, and in light of the results of those decisions?**

40. The mission has concluded that the program of investments funded by ADB was sound. The various projects and programs were designed to support sensible projects which in turn were components of a sound overall investment program. The conditions attached to the various loans were formulated so as to help meet strategic objectives for the sector.

### **5. What was the relative influence of the various elements of strategy on the ADB's lending program?**

41. The various elements of the strategy all influenced the program. For example, the Ghazi Barotha project supported both the least cost program for development of generation and supported use of indigenous resources. The program loan and much of the TA have focused on sector restructuring issues. All recent TAs have focused on sector restructuring issues. ADB's IPP investment in Fauji Kabirwala supported a viable private sector generation which is both repaying loans and earning dividends. This power station uses indigenous low to medium heat rate gas, which would otherwise not be usable as an energy source.

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<sup>6</sup> ADB. 1995. *Energy Policy of the Asian Development Bank*. Manila.

## **6. What was the quality of ADB's formalized country strategies?**

42. There are various references to energy in all ADB's country strategy documents. The level of detail and vision for the sector varies considerably between the documents. In 1985–1989 strategy recognized the energy sector as a top priority for the Government. In spite of this, ADB envisaged gradually reducing its overall share in the lending portfolio in the long run. Bilateral donors were expected to take up more projects in the sector with ADB devoting additional resources to coal and biomass energy. There was no reference to structural reform or the private sector. By 1990–1994, the focus had changed and ADB expected private sector involvement. ADB supported continued public investment, but on a smaller scale.

43. By 1995–1998, ADB is supporting government's strategy of maximizing private sector involvement through both new investment and privatization and aims to create a favorable environment for this through TA. ADB interventions are planned to be selective, to reduce the demand/supply gap, improve transmission and existing facilities and reduce dependence on imported fuels. The strategy for this period is the most detailed and thorough. By 1999–2001, the focus of strategy has changed and the emphasis is on the sector's financial condition. ADB proposes to use a program loan, with policy dialogue, to promote sector restructuring, privatization and commercialization.

44. By 2002–2003, ADB plans no further interventions in the sector but will continue to focus on indigenous energy, privatization and the enabling environment for private investment. In 2004–2006, the strategy is restricted to a summary of planned assistance such as a renewable energy project and a standby project on transmission. The strategy for 2005–2006 cites a strategic focus on power sector reforms through restructuring, privatization and unbundling. Proposed activities include technical assistance and projects in renewable energy, transmission and distribution. The strategies for both 2003–2003 and 2004–2006, and to a lesser extent 2005–2006, are brief and do not give a coherent overall picture of ADB's plans and the reasons for them. In this respect they are weaker than the strategies for 1995–1998 and 1999–2001, which give a better overall picture.

45. While the strategies for the power sector set out in the various country strategy documents are bland and in some ways disappointing, in this respect they are similar to the sections for other sectors. The strategies do evolve over time in response to the country's changing needs and level of development and changes in ADB's energy policy.

46. One notable feature of the strategy documents is the frequency with which they proposed reduced commitment to the power sector. In part this reflects the optimism during the 1990s that development partners would be able to leave the future development of the power sector to the private sector once privatization was complete. The 2005–2006 strategy is more realistic in not repeating this expectation.

## **7. Irrespective of strategy, what was the quality of the program for dimensions to soundness?**

47. The quality of ADB's program was generally good in that investment went into worthwhile projects which were completed as designed, albeit with some cancellations and delays. The program was also designed to address major areas of capacity shortfall.

**8. Were the choices made by those managing the program the right ones for maximizing results attainment?**

48. Given the less than satisfactory overall results obtained by the Pakistan power sector, discussed further below, it is tempting to conclude that ADB decisions contributed to the problems and that ADB should have pressured government more vigorously and more effectively to restructure the sector and ensure financial viability. However, the mission concludes that those managing the program did as much as they could to push through reforms necessary to reduce power losses, relate tariffs more closely to costs, improve revenue collection, promote sector unbundling and achieve commercialization and privatization.

49. For much of the past 15 years ADB has been between a rock and a hard place in running its power program in Pakistan. A stable power supply is vital for the economic growth of Pakistan and employment creation. Power cuts and the inability to offer supplies impose costs on the economy, which far exceed the value of financial savings in power utilities. Power shortages have been commonplace and the need for sector reform has been apparent. Government has agreed with the principles. Disengagement by ADB would, based on international experience, be unlikely to have prompted improved government efforts to achieve reform and financial viability. Moreover, there has always been a nominal commitment to a reform program and limited steps have been taken from time to time to make reform effective. But at the same time, the sector has performed poorly in financial terms. Adherence to financial covenants has been poor and reform programs have been delayed repeatedly.

50. Within this difficult and unsatisfactory framework the mission concludes that the choices made by ADB management were sound. This conclusion is based on the following factors:

- (i) Cash to the sector was limited. There have been few new loans in recent years. The last project or sector loan was in 1995, for the Ghazi Barotha project. The program loan provided in 2000 should be viewed as part of Pakistan's structural adjustment program rather than purely a power sector intervention and was preceded by several years of policy dialogue, supported by TA, without any new lending.
- (ii) There were detailed and consistent conditions on loans relating to sector performance and reform. Covenants on power system losses, management of accounts receivable, self financing ratios and debt service ratios have been requirements of all recent loans. The program loan contained a very detailed series of commitments on both reform and finance and the loan was divided into four tranches with payments contingent on meeting reform conditions.
- (iii) Sanctions were imposed when covenants were not met. Over half of the last loan to KESC was cancelled. The Ghazi Barotha loan was delayed because of noncompliance with financial covenants.
- (iv) Intensive TA and policy dialogue was provided to promote reform. The list of ADB technical assistance projects is tribute to the intensity with which ADB has supported many major aspects of the reform program, in particular the changes at KESC and the creation of NEPRA.
- (v) Project selection was sound. The projects in which ADB has invested have generally performed satisfactorily and contributed to sector needs.
- (vi) Coordination with other development partners, and in particular the World Bank, was generally successful. Despite some differences over detailed policy issues and tactics, the World Bank and ADB have worked well together in promoting sector reform.

51. The continuity of ADB's effort has been facilitated by the continuous engagement of a single project officer on the Pakistan program. This has simplified the process of ensuring continuity of approach, especially in an environment where the policy dialogue with government is often not being fully documented.

**9. How have the sectors, and their institutions, supported by ADB operations performed?**

52. The overall performance of the power sector and its institutions over the past 15 years has been at best moderate. Sector unbundling, corporatization, and privatization have proceeded very slowly. As long ago as 1991, WAPDA was instructed by government to commence privatization of portions of its operations. ADB offered to provide support for a KESC privatization study in 1991. A "Strategic Plan for Privatization of the Power Sector" was adopted by government in 1992. Kot Addu Power Plant (1,638MW) was transferred to private sector management in 1996 through a privatization process whereby initially 26% of the shares were transferred with management control. Later an additional 10% of the shares were transferred to the private owner. In December 2005 a majority stake in KESC was sold to a private investor. Private finance has been attracted into the generation sector through IPPs. While unbundling has been completed, the various entities created from WAPDA still lack independence from WAPDA and from one another. The nine distribution companies, which were created in 1998, are still financially integrated with WAPDA, lack the technical skills to operate independently, do not have notified tariffs and have managers who are WAPDA employees.

53. Performance has also been moderate. Technical transmission and distribution losses have continued and, in the case of KESC, grown over the past decade. Financial results have fluctuated but generally been disappointing since the mid 1990s. Every covenant on debt servicing and counterpart funding has been missed, thus delaying projects. Investments in generation, transmission and distribution got out of balance, with excess generation capacity in the late 1990s.

54. ADB and World Bank have been clear and consistent in their focus on these areas and government has stated support in principle in agreeing loan conditions and public statements. The reforms, while complex, do not require such long periods to complete. The means to reduce technical losses and improve financial performances are well understood. Hence, the outcomes must be viewed more as a failure of implementation of government policy than of ADB strategy.

55. There are a number of explanations for this failing, some of them clearly external to the Pakistan power sector. First, government has been unstable with several changes of regime over the period. Second, Pakistan's nuclear tests caused a rift in relations with ADB and other development partners. Third, external events such as the 11 September 2001 terror attacks and war in Afghanistan influenced Pakistan heavily and caused the withdrawal of international resources from the country for a time. Fourth, the Asian financial crisis impacted on Pakistan, in common with other countries, and contributed to a short term reduction in power demand at a time when capacity was being added rapidly. Fifth, international investors are now far more cautious about power sector investments in developing countries and hence the environment for privatization of power sector assets is more difficult than it was in the late 1990s.

56. But at the same time, it is clear that the commitment to reform and performance improvement of those working in the power sector has been neither complete nor consistent. Creating PEPCO as a subsidiary of WAPDA was bound to cause delays because some senior staff in WAPDA were certain to have a personal career interest in delaying restructuring.

Transferring responsibilities out of government and to the power regulator means ministers and civil servants giving up responsibilities they have exercised for many years and this was also an inevitable source of delay. Having multiple agencies involved in the sector is also a certain recipe for delays as it becomes necessary to get overall commitment to required changes.

57. But it is important to emphasize that there are many positive features to government's reform efforts. For example:

- (i) The power sector has made excellent use of indigenous sources of hydro capacity and gas, which provide a high proportion of total energy needs.
- (ii) NEPRA has been established as a power sector regulator and has demonstrated its ability to review tariff submissions and work at arms' length from government.
- (iii) There has been considerable progress on restructuring WAPDA. Institutional unbundling is complete in so far as the new structure is concerned although there are a number of steps required to complete commercial separation of the new entities.
- (iv) The privatization of KESC has been achieved. This is a considerable achievement for government and has involved many difficult decisions in areas such as recapitalization.
- (v) Indebtedness between sector entities and government, which was a major issue at the time of the program loan, has now been largely resolved and transactions have largely been put on a commercial basis. The level of debts in the sector has been reduced as a result and is now at or close to commercial levels.
- (vi) System losses in transmission and distribution have been reduced slightly and there appears to be a better focus in the distribution sector on achieving and sustaining improvements.
- (vii) Generation, transmission, and distribution resources have been brought back into better balance after the excessive investment in IPPs in the mid-1990s.

Overall, the mission considers that the current position of the power sector is far better than it has generally been over past decade and provides a good framework for sustainable further development.

**10. In what ways may ADB resources have contributed to these sector outcomes, or not as the case may be?**

58. ADB resources have contributed to the sector in a number of ways, both operational and intellectual. ADB's loans and investments have helped the power sector to expand, benefit from the country's hydro capacity and improve transmission and distribution networks. They have supported a least cost development program. Perhaps more important has been the intellectual contribution in helping to establish an operational program for the implementation of sector restructuring through unbundling, commercialization and privatization. Both the World Bank and ADB have made major contributions in this area and helped the government through the most difficult steps of the reform process.

**11. Was there effective synergy between ADB resources and those of others?**

59. ADB resources have complemented resources generated within the power sector and those provided by the Government, by other development partners and by the private sector.

60. The resources provided by the Government and generated within the sector are intimately connected in that it is largely government decisions on tariffs that have influenced the ability of the sector to raise funds internally. The government has also been the interlocutor with ADB and other development partners in a policy dialogue on reform of the sector. Synergy here has been less than fully effective because government and sector agencies often had difficulty in raising the counterpart funds to complement ADB resources. This has led to delay and cancellation of projects. Synergy on policy dialogue also left something to be desired. While there was general agreement over principles, government has had difficulty in adhering to commitments over sector financial and operational performance, unbundling, commercialization, and privatization.

61. ADB has worked with other development partners, in particular the World Bank, on the cofinancing of investment projects and on policy dialogue with government. All recent loans have achieved a high level of synergy with other development partners. The program loan was coordinated with the IMF and World Bank as part of Pakistan's structural adjustment program. The Ghazi Barotha loan was part of a package in which ADB, the World Bank, JBIC, KfW, EIB, and IDB all participated along with local funds. The KESC sixth power sector loan of \$200 million loan was designed, with cofinancing, to support total investment of \$678 million.

62. On policy dialogue, the World Bank and ADB worked together in providing thought leadership to the development partner community and the sector. Throughout the past decade, there has been a high level of consistency between the approaches of the two major development partners, as well as with the IMF in agreeing Pakistan's structural adjustment program. There has also been an agreed division of labor, with the World Bank taking the lead on WAPDA and ADB on KESC. Both banks have provided complementary TA.

63. There have been differences of view between ADB and the World Bank. The 1994 power policy was largely based on World Bank advice and ADB had reservations over the price offered to generators and the location of some of the generation projects. The World Bank view was that the terms offered were the minimum necessary to attract private sector interest. Subsequently, ADB helped with a revised version of the investment policy, which became the 1998 power policy. This policy has attracted criticism for failing to attract any investment, although it was promulgated at a time when there was little need for new investment and many IPPs were in dispute with government over unilateral requests for tariff reductions. It is virtually impossible to reach a view on the various differences of view so long after the event. Moreover, IPP policy worldwide has been largely a matter of learning by doing in an environment where there was virtually no experience 15 years ago. There have been significant and beneficial improvements to contracting arrangements over this period. The differences between ADB and the World Bank should be viewed as legitimate and entirely understandable differences of view in an environment where both parties were largely committed to the same overall policy of unbundling, commercialization, privatization, and attracting private investment.

64. Synergy with private sector investors was also good. ADB worked with other investors to promote the Fauji Kabirwala project and more generally the mid-1990s were a period when private investors came into the sector. The only shortcoming on synergy with the private sector arises from a sector perspective, because too many IPPs were commissioned in the mid-1990s. However, this reflected government decisions, which were taken against the advice of development partners. More recently, ADB has helped to develop the enabling environment for private investment in power projects through assistance with government's 1998 power policy.

## **12. How can choice selection and decision making processes be improved in the future?**

65. This evaluation of ADB's assistance program in Pakistan is generally positive and improvements to choice selection and decision making processes can be made most effectively by building on the strong base of knowledge and involvement which ADB has developed over the many years that it has been involved with Pakistan's power sector.

66. The key areas where ADB may be able to improve in future are through:

- (i) A better articulation of ADB's vision, strategy and objectives for the power sector. This could be a part of ADB's next country strategy or produced as a separate document if the country strategy proves unsuitable.
- (ii) A regular annual commitment of funds to the power sector, with a degree of flexibility over the ways in which the funds might be used provided that the entities using the funds were financially and operationally viable.
- (iii) An annual and public exchange of commitments between ADB and the government to document the results of ADB's policy dialogue with government and to set out steps being taken to meet (and where necessary modify) the agreed strategy and objectives and pursue further reform objectives for the sector.
- (iv) A strengthening of ADB capabilities in the power sector at its Pakistan Resident Mission.
- (v) Seeking greater involvement from bilateral donor agencies in funding the continuing TA needs of the power sector.
- (vi) Widening the type of support offered through TA to include possible twinning arrangements as well as advice from competent firms of consultants.
- (vii) Greater support for investment initiatives that would clearly benefit the poor.

67. These recommendations need to be understood not only the context of ADB's and government's past performance but also in the context of the present situation of the power sector. This position is explored in some detail in the following section of the report. The concluding section then provides an overall assessment of ADB's assistance program, identifies lessons from experience to date, and sets out recommendations in more detail in the light of current sector conditions.

### **III. MAIN ISSUES FACING THE SECTOR**

68. The Pakistan power sector is potentially at a turning point. Government has taken some difficult decisions, for instance in restructuring KESC and undertaking its privatization. Sector restructuring is in progress, albeit slowly. Losses of power have been reduced slightly in some areas. However, as ADB considers its future strategy in the country and sector there are a number of major issues to be addressed. The most important of these are the risks facing sector reforms, potential capacity shortfalls and rising investment needs and the sector's continuing financial problems.

#### **A. Risks Facing Power Sector Reforms**

69. Reform of the power sector is clearly a work in progress. There are many obstacles to be overcome before the reform process is complete. In the short term, the sector is moving towards completion of the unbundling process with a "single buyer plus" power market and a

regulator reviewing tariffs between sector entities and for consumers. IPPs continue to have 25-year government guarantees on their PPAs. The longer term aim is for a fully competitive power sector in which there are multiple buyers and sellers. Distribution companies will be able to buy power direct from generation companies and pay NTDC a wheeling fee to bring power to their distribution areas. Large industrial consumers will also be able to purchase power direct from generators. There will be a pool market for trading power between generators and retailers. IPPs will no longer have government guaranteed PPAs but will have contracts with distribution companies and large users. In due course the market will become fully competitive and there will be competition at household level. The role of the regulator will diminish as the role of competition increases.

70. There are numerous risks to this process, in both the short and the longer term, which may prevent or delay the achievement of a fully reformed power sector.

71. The main short term issues before reaching the “single buyer plus” market model are

- (i) the creation of independent and commercial distribution companies,
- (ii) the establishment of a financially viable single buyer,
- (iii) resolving the role of government in providing subsidy, and
- (iv) achieving an appropriate regulatory balance between the interests of customers and investors.

72. Nine distribution companies have been created out of WAPDA. However, they are some way from achieving autonomy. Their finances are wholly in the hands of WAPDA headquarters, which receives all revenue and pays all bills. Tariff applications to NEPRA have also been largely handled centrally. Some senior managers are still on the WAPDA payroll rather than the payroll of the distribution company. The companies are generally reliant on WAPDA technical support for management of their high voltage distribution networks. WAPDA continues to appoint a number of members of the Boards of Directors. Government has not yet approved tariffs for the companies. Only five of the distribution companies have created web sites and of those who have none has yet published its accounts on the Internet. The companies have balance sheets which are at best barely solvent and in some cases already insolvent. Arrangements to transfer business assets are agreed in principle but not completed. There is optimism in the industry that these issues can be resolved quite quickly. However, the track record would suggest that any optimism is misplaced. The distribution companies were created as long ago as 1998 and it should not take this long to give them full independence.

73. Under the new industry structure, there are plans to create a Central Power Purchasing Agency (CPPA), which would buy power from the generators and sell to the distribution companies. The distribution companies in turn would be allowed to procure their demands from any other generation sources under the “single buyer plus” model envisioned by NEPRA. However, there has been no significant progress in the establishment of the CPPA. There is a possibility of converting the existing WAPDA Power Privatization Organization (WPPO) into CPPA. The CPPA may operate as a branch of NTDC. The role is very risky financially in that CPPA’s ability to pay generators will depend on it receiving payment in turn from distribution companies. All the distribution companies face solvency issues and several of them are making losses and likely to continue to do so. The arrangements for passing increases in fuel, and hence generation, costs to consumers through tariffs are not in place and this creates a risk that even solvent distribution companies could quickly become insolvent by selling electricity for less than its purchase price.

74. Current tariff levels and structures involve substantial cross subsidies, from industrial and commercial consumers to agricultural and small (under 50kWh per month) domestic consumers. At some stage government has to decide a subsidy policy, i.e., does it wish to support the subsidization of small domestic and agricultural consumers and if so how is this to be financed. A direct subsidy policy will be costly. A cross subsidy policy runs the risk that industrial consumers will seek power supplies from elsewhere as soon as they are able to do so because this will reduce their costs. The distribution companies are entitled to a 3-year notice period before customers move to other suppliers, which will delay the problem but not resolve it. Privatization and long term financial viability in the sector depend on establishing a structure which is workable in the long term. The sector also receives overall subsidies in the form of both direct subsidies (to KESC) and the provision of free capital on which no return is expected (to both KESC and WAPDA). These will continue to be necessary so long as government fails to notify tariff increases allowed by NEPRA. For example, NEPRA allowed a tariff increase to KESC in October 2004, which has still not been notified. Such behavior will also discourage private investors from entering the distribution sector.

75. NEPRA and the government (including the PPIB) are currently in dispute over various tariff issues on IPPs. The Prime Minister's Office has recently asked an adviser to resolve controversy between the two over tariff rules. This dispute has a positive side in that it demonstrates a degree of independence on the part of the regulator. But if disputes cannot be resolved this may put at risk future investment in generation projects and the sale of distribution companies. Regulation is always as much an art as a science and ultimately NEPRA has to resolve tariff disputes on a basis that will attract investment as well as protecting consumers. An independent, light handed, nondiscriminatory regulator is absolutely critical to the future success of the power sector.

76. The resolution of these tariff and regulatory problems could be close at hand. Discussions are in progress within Government over the issue of subsidy policy and the status of the single buyer. With resolution of these issues Pakistan could quickly achieve an effective, regulated power market, albeit largely within the public sector, based on the single buyer model. This would be a significant achievement for which both the government and development partners such as ADB and the World Bank would deserve credit.

77. Such an achievement should give all market participants confidence that future issues in the reform of the sector can be effectively resolved. However, there is no doubt that the sector faces major longer term challenges in order to progress from the single buyer market to a more complex market structure in future. Continuing issues which are likely to have to be resolved include

- (i) the complexity of the industry structure,
- (ii) the length of time required to complete privatization,
- (iii) arrangements for transition to a competitive market,
- (iv) ensuring implementation of a least cost generation and transmission plan,
- (v) achieving an appropriate balance between renewable and hydro/thermal energy, and
- (vi) keeping up to date with international technical developments.

78. There are five central government agencies with responsibilities in the power sector and provincial governments also have power sector responsibilities. The Ministry of Water and Power is the sponsoring ministry for the sector and oversees issues of energy policy. The Privatization Commission, under the Ministry of Privatization, deals with privatization issues and

handled the sale of KESC. The Private Power and Infrastructure Board implements government power policies and in particular aims to attract private investors to generation projects. The Alternative Energy Development Board (AEDB) is part of the Prime Minister's Office and is promoting the exploitation of alternative energy resources such as wind power and small scale hydropower projects. Provincial governments, rather than central Government, have responsibility for hydropower projects of up to 50MW. NEPRA and central Government are already in dispute. The mechanisms required to introduce to the grid alternative energy resources, which are unlikely to be commercially viable in the short term, will be complex and difficult for AEDB and NEPRA to agree. Provincial governments lack the expertise of PPIB in creating the environment to sponsor private sector power investment.

79. Privatization efforts could continue for years. The successful sale of KESC is a major step forward. In future, the nine distribution and four generation companies created from WAPDA are also supposed to be privatized. The efforts of the Privatization Commission for privatization of Jamshoro Power Generation Company (JPGL) and Distribution Company of Faisalabad (FESCO) received set backs after NEPRA announced their tariff determinations. All the short listed bidders for these companies who had invested their time and money in carrying out the due diligence are waiting for the resolution of the tariff dispute between the Government and NEPRA.

80. Even when NEPRA sets commercially viable tariffs, which are notified by Government, some of the distribution companies (in particular TESCO, the company responsible for the Tribal area and perhaps others) appear to be unviable and will be difficult to sell even in the medium term. There are alternative privatization models that may be considered such as asset leases and management contracts but development of such models will be time consuming and complex. The appetite for the companies stock is likely to be limited and the Privatization Commission will probably need to schedule sales over a number of years. Few international investors showed interest in purchasing KESC. Moreover, it will not be in the sector's interests to have privatization sales competing for funds with new generation projects. However, until the sector has been substantially privatized and there is sufficient generation capacity to meet normal demands on the system, the transition to a fully competitive power market is unlikely to be desirable or feasible.

81. Arrangements for transition from a single buyer market plus model in which the market is contestable for larger consumers to the final model of a fully competitive market are bound to be complex. Indeed it may even be premature to be thinking about arrangements for a fully competitive model. NEPRA is working on the basis that such a transition may be achievable by 2012. This seems unlikely and ADB itself envisaged a longer time scale in the appraisal of its program loan. The key feature of a purely competitive market is that it can finally eliminate the need for any government guarantees to the sector. While this may be desirable in principle it will come at a price in that investors are bound to demand a premium for operating in a market with merchant power plants and shorter term contracts with distributors and large consumers.

82. Ensuring that the sector follows a least cost generation and transmission investment program is bound to raise some problems. Private sector investors generally prefer to undertake construction of thermal fuel base load plants as there are fewer risks than in hydropower projects or peak load plants. They may also be concerned by the prospects of WAPDA building hydropower plants with negligible marginal costs of operation and prejudicing utilization of their plants. WAPDA, PPIB, and the Government may have difficulty in promoting hydropower projects (in the public or private sector), in particular in the early stages before feasibility studies are complete.

83. It is government policy to have 10% of energy supplies (2,700 MW) from renewable resources by 2015. This is an ambitious objective. Investigations are already under way into various wind power projects but these are unlikely to be commercially viable in the short to medium term as capital costs are in the region of \$1 million per MW. For comparison, gas turbine combined cycle plants cost about \$0.75 million per MW. Moreover, wind power projects cannot offer firm power supplies because of the unreliability of the wind. Government may wish to intervene in the generation market to some extent (as happens, for example, in the United Kingdom) to ensure that such projects are constructed in order to reduce use of fossil fuels and increase indigenous energy use. The impact of such efforts on the overall power market are bound to be contentious.

84. In discussions with PPIB, NEPRA, NTDC and retailers it was clear that Pakistan has benefited substantially from international expertise in power sector reform and methodologies for contracting IPPs, regulating utilities, managing the single buyer role and similar areas. The power sector will continue to need this expertise. Contractual arrangements for IPPs are being improved all the time, generally with benefits for both generators and buyers. Regulation is a fast evolving field and NEPRA's role will change as the market moves to greater competition. The necessary skills will have to be brought into Pakistan through TA as the leading edge developments are inevitably taking place elsewhere in the world.

## **B. Potential Capacity Shortfalls and Rising Investment Needs**

85. Demand on the power sector is growing rapidly, reflecting the expansion in the Pakistan economy. Table 8 sets out growth rates of GDP and electricity sales in recent years. The relationship between the two is not simple. Electricity demand generally grows more quickly than GDP but with exceptions in, for example, 1998 and 2003. There are a number of possible explanations for this such as unserved power demand, investment by industry in captive power plants, changing rates of theft and different growth rates in different sectors of the economy. However, both recent data and international experience suggest that power demand is likely to grow more rapidly than the economy as a whole for the next few years. GDP is forecast to grow by over 6% this year.

**Table 8: Growth Rates of GDP versus Electricity Demand Growth**

<b>Year Ending 30 June</b>	<b>Growth Rate of GDP</b>	<b>Maximum/Peak Demand (MW)</b>	<b>% Increase in Maximum Demand</b>	<b>Energy Demand (GWh)</b>	<b>% Increase in Sales</b>
1995	5.3	9,697	2.19	40,456	6.83
1996	4.6	9,791	0.97	42,468	4.97
1997	1.9	10,081	2.96	44,078	3.79
1998	3.5	10,554	4.70	45,646	3.55
1999	4.2	10,922	3.48	43,207	(5.34) Decrease
2000	3.9	11,144	2.03	45,518	5.34
2001	2.2	11,578	3.89	48,480	6.50
2002	3.4	11,993	3.58	50,332	3.80
2003	5.1	13,017	8.53	54,397	8.07
2004	5.8	14,058	8.00	59,092	8.63

GDP = gross domestic product, GWh = gigawatt-hour, MW = megawatt.

Source: Information collected by the Evaluation Team from various sources in the Pakistan power sector.

86. Growth in demand implies that substantial investment will be needed to maintain continuity of supplies. Even with demand growth of 5% per annum, substantially below both growth rates over the past 2 years and the expected growth rate of the economy, capacity needs will expand by about 700 MW per annum in the short term and more rapidly in the medium term. Pakistan's Medium Term Development Framework envisages a GDP growth rate of 7.6% per annum between 2005 and 2010 and an expansion in generation capacity of 7,880 MW over that period (over 1,500 MW per annum). Beyond 2010, capacity is expected to increase by a further 20,120 MW by 2015. The least cost approach to meeting these needs will be a combination of reducing transmission and distribution losses together with hydro, gas, oil and coal fired plants. Loss reduction should be a high priority because it frees capacity quickly and cheaply. Gas plants are generally cheapest with costs of less than \$0.75 million per MW but hydro plants have lower operating costs. Letters of interest have been issued by the Private Power and Infrastructure Board for 11 projects with a total capacity of 2,346 MW and at a total likely investment cost of \$2.22 billion, an average cost of just under \$1 million per MW.

87. Because their past investments were successful, there is an interest in new generation projects from both local and international investors. But there has to be considerable doubt over whether investment on the scale of \$700 million to \$2 billion per annum can be financed. International power companies certainly have less appetite for foreign investments in generation projects than they had in the mid 1990s.

88. Generation is the most capital intensive area of electricity supply. However, there are also substantial investment needs in the transmission and distribution sectors. Recent estimates from the utilities suggest that:

- (i) NTDC is looking to invest 26 billion rupees over 5 years in transmission, equivalent to about US\$100 million a year.
- (ii) The distribution companies estimate their investment at over 50 billion rupees over 5 years, equivalent to about \$200 million per year.
- (iii) KESC has investment needs of about 14 billion rupees over 5 years, equivalent to about \$50 million per year.

89. Taken together, these investment needs amount to about \$350 million per annum over and above the investment needed in generation. It may prove possible to cope with a lower investment level in practice but these figures are indicative of substantial investment needs in the transmission and distribution sectors. ADB has already put in place proposals for substantial new loans for transmission and distribution in the 2005/06 Country Strategy and Program Update.

90. One of the alternatives to these investments in the power sector is further substantial investment by industry in captive power generation plant. Typically such plant uses fuel oil. Such investment may be acceptable as a second best solution in cases where the industrial investment would otherwise not take place. But it is clearly inferior to carrying out investment in an efficient power sector, which should be more capable of exploiting low cost hydro power capacity and developing more efficient large scale power plants using indigenous gas. Captive plants also deprive the power sector of their most profitable and best paying customers.

### C. Resolving Financial Issues in the Power Sector

91. The Pakistan power sector has faced a series of financial problems over the past 15 years. Loan agreements have generally contained financial conditions and failure to meet these conditions has on occasions led to loan commitments being unutilized because, for example, of failures to raise counterpart funds. The project completion report for Loans 1143/1144<sup>7</sup> draws attention to delays in making the loan effective because of WAPDA's failure to meet conditions on accounts receivable. Subsequently, WAPDA failed to meet commitments on transmission losses, accounts receivable, self financing ratio and debt service coverage ratio during implementation. A total of \$113 million out of \$200 million committed to KESC under Loans 1314/1315 (footnote 4) was cancelled and the project significantly reduced, largely because of KESC's failure to meet loan conditions relating to counterpart funds. JBIC and EIB also cancelled loans, which were originally intended to support the same projects. The draft project completion report on Loan 1424<sup>8</sup> draws attention to WAPDA's failure to mobilize adequate counterpart funds and the adverse impact this had on project timing because lending was deferred by ADB. The lending conditions for Loans 1807/1808/1809 (footnote 5) include numerous conditions relating to the financial restructuring of both KESC and WAPDA.

92. ADB has worked with other development partners in trying to establish a financially sustainable structure for the power sector. For example, in April 2002 a Financial Improvement Plan for the power sector was agreed between the Government and multilateral financial institutions. Subsequently, in February 2003 a letter of intent was sent to the International Monetary Fund (IMF) detailing planned financial reforms in the power sector, following WAPDA's default on debt service obligations.

93. During the past 5 years there have been improvements and government has faced up to some difficult decisions about sector finances. But the power sector remains in a parlous financial condition. This is reflected in the results of both KESC and WAPDA.

94. The financial and operational performance of KESC has been consistently poor over the past 10 years. Until 1994/95 KESC made profits. However, in the following 10 years the company has made a loss every year. In 2001/02 and 2002/03 losses were more than 50% of total revenues.

95. One of the major factors behind the poor performance of KESC was high levels of losses of electricity (through technical factors and theft) and poor collection of amounts due from customers. According to KESC figures, published in its annual reports, transmission and distribution losses rose steadily from 27.4% of supply in 1993/94 to 41.1% in 2001/02. Since then the level of losses has fallen slightly to 37.8% in 2003/04 and the company expects a further decline this year. Results for the first half of the year are encouraging with a reduction to 34.2%. However, these figures may present an unduly flattering picture of KESC's performance. Figures elsewhere in KESC's reports show figures for energy production and sales and suggest that losses rose from 32.2% of total production in 1993/94 to 44.6% in 2001/02 and have since improved to 40.9% in 2003/04. These higher figures include losses at the generation stage and hence are not on the same basis as figures for transmission and distribution losses.

96. Figures on transmission and distribution losses may be unreliable. In 2001, the PricewaterhouseCoopers report on the privatization of KESC suggested that actual losses might be higher than KESC's figures suggested with the outcome masked by over billing, average

<sup>7</sup> ADB. 2003. *Project Completion Report on the WAPDA Twelfth Power (Sector) Project*. Manila.

<sup>8</sup> ADB. 2005. *Project Completion Report on the Ghazi Barotha Hydropower Project*. Manila.

billing and inaccurate metering. The figures in KESC's annual reports are different from the figures quoted in WAPDA's Power System Statistics. According to the 29<sup>th</sup> Issue, published by the Planning Department of WAPDA in February 2005, KESC's transmission and distribution losses rose from 24.8% of supply in 1993/94 to 47.4% in 2002/03. The level of losses has fallen slightly to 44.7% in 2003/04. Moreover, ADB has itself now decided to place less stress on conditions relating to system losses and focus instead on financial issues. This may well be a better approach in setting conditions for loans but system losses remain an important measure of management efficiency and are certain to be a focus of attention by NEPRA.

97. KESC has also had continuing problems in collecting revenues from power consumers. An approximate measure of performance at collecting debts can be obtained by looking at the level of bad debt provisions made year-on-year by the company. These have risen from about 1% of revenue in 1992/93 to as high as 8% in 1997/98. They have continued to exceed 6% in the past 2 years. The company believes that this will improve in the near future, but there is bound to be a delay because of the bad debt policy of the company. No provisions are made until 2 years have passed after a bill has been issued and debts are provided in full only after a 4-year wait for payment. The debts, which are being provided for in 2003/04 were therefore reflected in billings in 1999/2000 and the following 2 years. According to company figures, current collection rates are running at about 97% of billings. The likelihood of future improvement is borne out by the fact the overall level of outstanding debts dropped in 2003/04 and has fallen further in the half year to 31 December 2004 to a level equivalent to less than 3 months revenue. While there is scope for further improvement, this is a reasonably commercial level of performance.

98. KESC is persistently loss making and, even with a better performance on controlling theft of electricity and bad debts, it will have problems in breaking even. Recent trends appear encouraging in that total costs were only 22% greater than revenue in 2003/04 compared with 42% in 2002/03 and 57% in 2001/02. However, this improvement is misleading because a large part of it has been achieved by a major capital reconstruction of the company. Government has swapped over 80 billion rupees of debt for equity over this period and this has substantially reduced KESC's financing costs, which are now very low. A more consistent comparison looks at KESC's expenditure excluding financing costs. These have fallen from 132% of KESC's revenue in 2001/02 to 120% in 2003/04. Accounts for the first half of 2004/05 show a discouraging trend with operating costs increasing faster than revenue and financial losses increasing, in spite of the reduction in technical losses.

99. For the past 2 years, the Government has given a subsidy to KESC (in addition to the capital reconstruction) amounting to 5.8 billion rupees in 2002/03 and 9.6 billion rupees in 2003/04. There is a planned reduction to 6.5 billion rupees in 2004/05, which may be difficult to achieve based on results for the year to date, even though KESC remains confident. KESC received a subsidy of 6.2 billion rupees by the end of March so cash flow will need to improve significantly in the final quarter and there is no evidence to suggest how this will be achieved. The subsidy ensures that KESC can fund some necessary improvements to its system, which are themselves necessary to reduce system losses (both technical and non technical).

100. WAPDA is a significantly larger company than KESC. Although its relative performance is better than KESC, in aggregate its financial needs are greater. It has made financial losses in a number of recent years, but these have never exceeded 11% of the authority's revenue. Losses in 2004/05 are likely to be significant because of a combination of increasing fuel prices and unchanged tariffs. WAPDA received a supplementary grant from government of 21.162 billion rupees in May 2005, which was in addition to an amount of 5.457 billion rupees received

earlier in the fiscal year. Thus total support to WAPDA during this fiscal year was almost 27 billion rupees.

101. System losses are a recurrent problem and have been in the range of 25–28% in recent years with little apparent trend. Bad debt provisions have been in the range of 1–2% of revenues. In both cases these results are better than those achieved by KESC. Overall it appears that WAPDA as a whole could achieve financial viability without undue difficulty through a combination of improved efficiency and increased tariffs, provided that it is allowed to pass fuel cost increases on to consumers promptly.

102. The unbundling of WAPDA is creating a number of new entities. They are being passed assets and liabilities from WAPDA. All of the distribution companies that have been created are currently either insolvent or on the verge of insolvency. This means that they would be unable to contract for power purchases in a purely commercial environment. However, PEPCO is considering financial reconstruction, through debt for equity swaps, in all the distribution companies. This will eventually have to be decided by government, which will have to forgo repayment of the debt. The example of KESC suggests that there is a willingness to face up to the implications and costs of this sort of transaction.

103. There are considerable differences between the distribution companies in their performance on transmission and distribution (T&D) system losses. This is illustrated in Table 9.

**Table 9: Transmission and Distribution Losses, 2003–2004**

<b>Electricity Supply Company</b>	<b>Percent</b>
Faisalabad	10.4
Islamabad	14.9
Gujranwala	16.0
Lahore	17.4
Multan	22.0
Quetta	22.5
Peshawar	31.4
Hyderabad	41.4

Source: Water and Power Development Authority.

104. No figures are available for the Tribal Electricity Supply Company but its performance is certain to be poor. The losses in Multan, Quetta, Peshawar, and Hyderabad exceed levels that NEPRA is likely to find acceptable for tariff purposes. It may require subsidy from government to cover excess costs in the short term. Such subsidy is assumed in the current financial projections for the distribution companies.

105. NTDC finances also raise significant issues. The main concern here is how the company can manage the risks associated with being the single buyer in the Pakistan power system. This role carries significant risks if one of the retailers defaults and there is every possibility that this will happen with the poor position and performance of the weaker retailers.

106. None of the issues discussed above are insoluble. With commitment and goodwill they could be largely resolved within the next 2 years. The problems over system losses in the weaker distribution companies, including KESC, might require a longer time frame than this but the methods of achieving improvements are well understood. Government subsidies may be required for distribution operations in remote areas but such subsidies have been used before and could be put on a sustainable basis without undue difficulty. However, the history of the

sector suggests that financial reforms are among the most difficult to implement and a longer time frame may be needed in practice.

#### **IV. CONCLUSIONS, LESSONS, AND RECOMMENDATIONS**

##### **A. Assessment of ADB and Government/EA Performance**

107. This assessment of performance in the power sector is based on OED's five standard evaluation criteria of relevance, efficacy, efficiency, sustainability, and institutional development and other impacts. These components are summarized at the conclusion of the section to provide an overall assessment.

##### **1. Relevance**

108. Investment in the power sector is at present highly relevant to Pakistan's development objectives. GDP growth exceeded 5% in 2003 and 2004 and is likely to do so again this year. The Medium Term Development Framework (MTDF) for 2005/10 identifies energy security as one of the five pillars of growth, alongside water resource development, transport and communications, human resources and reform. The MTDF envisages a GDP growth rate averaging 7.6% for 2005–2010. This will continue to be driven by large-scale industry, which is growing considerably more rapidly than GDP as a whole, implying that electricity demand will also grow more rapidly than GDP. The Government and all development partners have identified greater investment in infrastructure, in cooperation with the private sector, as a key requirement to meet growth objectives.

109. This current situation remains consistent with the picture throughout the evaluation period. For example, in its seventh plan, quoted by ADB in the RRP for Loan 1073 in 1990, the Government identified the need "to substantially increase electricity supply to sustain the projected growth of the economy." In the RRP for Loans 1314/1315 in 1994, ADB concurred with the Pakistan Prime Minister that "Development of the energy sector is crucial to support continued growth of Pakistan's economy." In 2000, the Government's letter to ADB, setting out its commitments under the program loan, opened by saying that "the development of the energy sector...is critical to the achievement of the medium term economic framework and the government of Pakistan has recognized it as a priority area."

110. The lending strategy for Pakistan power has also been consistent with ADB's energy policy. It has significantly supported sector unbundling, commercialization and privatization, private sector participation in generation, improved governance, use of co-financing and capacity building. Progress has been slow in some of these areas, but where change has taken place it has consistently been in the right direction. The main area where results have not been achieved is in achieving sector financial viability.

111. The lending strategy for power has also built on ADB's various Pakistan country strategies, which have been prepared every two to four years. Overall, the mission considers that the power sector lending activities have been highly relevant to the needs of Pakistan.

##### **2. Efficacy**

112. ADB has applied five assistance modalities to Pakistan's power sector, public sector loans, a program loan, a private sector loan and investment, TA grants, and policy dialogue. The mission's conclusions are:

- (i) The public sector loans, aimed at expanding and maintaining the generation, transmission and distribution capacity of the Pakistan power system, generally achieved the expected outputs, albeit after delays and cancellation of some components. However, many of the conditions on those loans were not adhered and the loans did not meet objectives in areas such as reducing system losses and improving self financing. Conditions relating to power sector reform were partially met and often after delays.
- (ii) The single program loan had some successes in such areas as resolving the indebtedness of the power sector. However, privatization was not achieved on schedule and the unbundling of the sector has continued to be subject to delays.
- (iii) The private sector loan and investment contributed to a successful generation project.
- (iv) TA grants have covered a range of issues vital to the sector reform and generally contributed positively to policy dialogue and reform progress.
- (v) The policy dialogue, although largely undocumented, has been a significant factor in promoting reform and without this dialogue other assistance modalities would have been markedly less successful.

113. The assistance program is evaluated as efficacious. It has helped raise use of indigenous resources, augmented system capacity and contributed to partially successful reform of the sector. Against this, the financial position of the sector remains precarious, the sector has had a continuing negative impact on the government's fiscal position and reform has been far slower than was expected or necessary.

### 3. Efficiency

114. Table 10 below sets out the financial and economic internal rates of return (FIRR and EIRR) for the four most recent loans for which PCRs have been completed.

**Table 10: Financial and Economic Internal Rates of Return for Four Most Recent Loans with Project Completion Reports**

Loan	RRP		PCR	
	FIRR (%)	EIRR (%)	FIRR (%)	EIRR (%)
1073 – WAPDA Eleventh	12.8	11.2	Negative	Negative
1143/1144 – WAPDA Twelfth	12.9	23.6	12.6/11.9	13.5/13.9
1314/1315 – KESC Sixth	10.3	17.2	9.1	15.1
1424 – Ghazi Barotha	13.0	17.9	14.2	31.4

EIRR = economic internal rate of return, FIRR = financial internal rate of return, KESC = Karachi Electric Supply Corporation, PCR = project completion report, RRP = report and recommendation of the President, WAPDA = Water and Power Development Authority.

Source: Asian Development Bank project completion reports.

115. The PCR for Loans 1143/1144 evaluated the two subprojects funded through the loan separately. With the exception of loan 1073, the results are generally satisfactory with returns exceeding the executing agency's cost of capital. Only the Ghazi Barotha loan performed better than expected at appraisal but this is particularly important because of the huge size of the overall investment in this project.

116. The Fauji Kabirwala investment was expected at appraisal to provide a return of 22.5% on ADB's equity investment. This return has probably been bettered in view of the excellent results which the company is achieving but this has not been documented through a PCR.

117. ADB loans were generally subject to delays, in particular because of the inability of the executing agency to mobilize counterpart funds. More than half of Loans 1314/1315 was subject to cancellation for this reason.

118. Overall the mission assesses the assistance program as efficient.

#### **4. Sustainability**

119. Sustainability has a number of dimensions. From a technical point of view, the power sector entities in Pakistan appear competent to maintain and operate the assets which have been procured with ADB funding and the assets are operating well. From a human resources viewpoint, the sector is able to meet most of its needs. Continued support may be needed in accessing best practice skills in such areas as regulation and IPP contracting and adapting those practices to meet Pakistan's needs and development objectives. However, this reflects the situation facing all developing countries since these areas of activity are new and developments are taking place all the time in developed countries from which developing countries need to benefit. The newly created distribution companies are also facing some issues in human resources in recruiting financial specialists and engineers with experience of high voltage distribution.

120. The main area where sustainability is questionable is finance. The sector has lost money consistently over the past decade and will suffer further losses in 2004/5. A major factor is the system losses and the sector has a poor record on improving performance in this area.

121. Overall the assistance program is evaluated as sustainable.

#### **5. Institutional Development and Other Impacts**

122. The mission considers that three impacts should be reviewed under this heading, institutional development impact, socioeconomic impact and environmental and sociocultural impact. The conclusions are:

- (i) The institutional development impact has been considerable, with a different industry structure established over the past fifteen years, including an industry regulator and unbundled generation, transmission and distribution companies and significant private sector investment in generation. However, the pace of development has been disappointing. Although government has committed to reform principles and policies, the pace of implementation has been slow.
- (ii) Many families and businesses have benefited from the expansion of power supplies. The poorest households, with low power consumption, have benefited from a lifeline power tariff, which has been subsidized by government and other power users. However, the socio-economic impact of the power sector has in some ways been disappointing. The RRP for the program loan included a poverty impact assessment, which concluded that corrupt practices and the consequent cash shortfall in KESC "affected poor consumers more than other consumer groups" and that "poor consumers are especially susceptible to corrupt practices in collection, billing and connection fees." At the same time, ADB

lending has not focused at all on rural electrification, although the World Bank was active in this area and had a largely unsuccessful loan to support rural electrification. This situation is marked with Bangladesh, which used to be East Pakistan, where rural electricity cooperatives have had considerable success in extending supplies in rural areas.

- (iii) ADB's Ghazi Barotha loan had considerable environmental and socio cultural impacts directly because of impacts on river flows and resettlement issues and indirectly because of reductions in emissions compared to possible alternative thermal plants. The World Bank took a lead role on these issues and ADB was only involved to a limited extent. In general they seem to have been well handled.
- (iv) The Fauji Kabirwala project also had a significant environmental impact in that it enabled economic utilization of an indigenous gas resource that would otherwise probably have been unusable because of a poor heat rate. This reduced use of other fuels.

123. Overall, the mission rates the assistance program as moderate in its institutional development and other impacts.

## 6. Overall Evaluation

124. The overall evaluation of the assistance program is set out in Table 11.

**Table 11: Overall Evaluation of the Assistance Program**

Criterion	Weight	Assessment	Rating Value	Weighted Rating
Relevance	20%	Highly Relevant	3	0.60
Efficacy	25%	Efficacious	2	0.50
Efficiency	20%	Efficient	2	0.40
Sustainability	20%	Likely	2	0.40
Institutional Development and Other Impacts	15%	Moderate	1	0.15
Overall	100%	Successful		2.05

Source: Evaluation Team estimates.

125. This evaluation may be compared with the results of ADB's internal PCRs for the four recent loans, which have been subject to PCR. The results are in Table 12.

**Table 12: PCR Ratings of Four Recent Loans**

Loan Number	Description	PCR Rating
1073	WAPDA Eleventh Power	Partly Successful
1143/1144	WAPDA Twelfth Power (Sector)	Successful
1314/1115	KESC Sixth Power (Sector)	Partly Successful
1424	Ghazi Barotha Hydropower	Successful

KESC = Karachi Electric Supply Corporation, PCR = project completion report, WAPDA = Water and Power Development Authority.

Source: Asian Development Bank project completion reports.

126. The evaluations of the WAPDA Twelfth Power and the Ghazi Barotha Hydropower projects seem fair in the light of the conclusions in the PCRs. The evaluation of the WAPDA Eleventh Power project as partly successful reflects the poor financial results which WAPDA was achieving after the project was completed. These reduced the financial and economic returns on the project. The evaluation of the KESC Sixth Power loan as partly successful is an optimistic assessment for a loan of which well over half had to be cancelled for noncompliance with loan covenants. As a result of the cancellation, many of the objectives of the loan were inevitably not accomplished.

127. Overall, the evaluation of the program is therefore slightly more favorable than the evaluation of four of the major loans. This reflects recent improvements in financial, institutional and operational performance of the sector. The program is now showing results for the policy dialogue and conditions that have been imposed on loans over a number of years.

## **B. Lessons Identified**

128. The mission has identified the following lessons arising from the assistance program:

- (i) Consistent policy dialogue with government was vital to the success of the assistance program.
- (ii) The policy dialogue needed both donor coordination and TA to be effective.
- (iii) Timetables for reform action set out in the program loan conditions were optimistic and did not allow enough time to establish the pre conditions for privatization.
- (iv) ADB lending is most useful if it is leveraged by working with other sources of finance, both public and private.
- (v) Institutional and managerial changes and incentive structures are needed to achieve better management of system losses and performance.

129. ADB has made five sector and project loans to Pakistan in the past 15 years. All these loans have associated conditions but they have mostly been managerial in nature, relating for example to system losses, accounts receivable, tariffs, project management and data requirements. However, the policy dialogue which led to sector unbundling, corporatization, and privatization has been continuous over this period. The dialogue that led up to the program loan lasted over 2 years for example and this loan was the first to include policy conditions related to sector reforms. Such dialogue is vital when supporting complex reforms of the sort that have taken place in Pakistan. The occasional opportunity provided by setting loan conditions is not sufficient to ensure that reform takes place. The policy dialogue is not well documented but has acknowledged significance in the Pakistan power sector and has been consistent over many years. The continuous input of a single ADB project officer over this period has undoubtedly contributed to the consistency and quality of the dialogue.

130. It is unlikely that ADB policy dialogue in isolation would have led to significant progress in sector reform. However, the dialogue was supported by donor coordination and TA. The donor coordination, with the World Bank and the IMF in particular, was close and this is clear from, for example, conditions on the program loan and the loan for Ghazi Barotha. TA has helped the Pakistan power sector with many of the difficult aspects of reform such as privatization and regulation. It has also helped ADB to sustain its policy dialogue by being able to offer something on the table at a time when it was not making new loans.

131. The reform timetables set out in ADB's program loan have not been met. The loan was considered in November 2000, at the same time as the government sent its commitment letter. The plan envisaged the privatization of one distribution company and one generation company from WAPDA by December 2001 and of KESC by December 2002. While it is valid to set ambitious targets for program lending this objective was never realistic in view of the necessary preliminary steps for a transaction. Efforts were made to privatize the Faisalabad distribution company but these were frustrated by the absence of an agreed power tariff structure and other factors. In retrospect it might have been better for the lending conditions to focus on completing various steps towards privatization rather than the transaction itself.

132. Several of ADB's loans have been made in conjunction with other lenders in both the public and private sectors. This has two advantages. It helps to mobilize more resources for major projects which ADB or other individual donors would be unlikely to be able to fund in isolation. The Ghazi Barotha project is a good example. It also helps to keep other development partners on message with reforms. For example, when ADB cancelled loan commitments to KESC other development partners followed suit.

133. Conditions for reducing system losses and improve debt collection were a feature of several ADB loans. However, these conditions sometimes achieved very little. KESC's system losses rose significantly at a time when it was committed to significant reductions. WAPDA's system losses have changed little over the period. It is only when significant institutional and managerial changes have been put in place that there have been improvements.

### **C. Recommendations: Future Assistance Priorities**

134. Pakistan's power sector is at a strategic crossroads. The Government is near to the end of a key stage of the reform process in that it has completed some of the most difficult components of the unbundling and corporatization of the power sector. There are some further decisions to be made before this reform is complete but the most significant changes, such as establishing a regulator and separating distribution and generation companies out of WAPDA, have already taken place. The privatization transaction for KESC has now been completed and is a significant step in the reform process.

135. The economy is growing rapidly and power demand is expanding more rapidly than GDP, as would be expected at this stage of development. Power cuts continue to be a problem in many areas of Pakistan, particularly in Karachi, and required investment in the sector could reach or even exceed \$2 billion per annum over the next few years. The private sector may provide some of the investment resources but it is unlikely that the entire sum can be mobilized privately in the current international investment climate. Development partners such as ADB therefore have a continuing and crucial role to play in guiding and financing the development of the power sector.

136. The mission's key recommendations are:

- (i) ADB should agree with the Pakistan government on a succinct but meaningful medium term strategy for the power sector.
- (ii) The strategy should be accompanied by an annual lending framework, which would also be agreed between government and ADB.
- (iii) ADB should actively seek private sector investment opportunities and aim to leverage private sector funding.

- (iv) ADB should strengthen its capacity for policy and other dialogue in its Pakistan Resident Mission.
- (v) In formulating future lending plans, ADB should aim to identify some pro-poor investments for inclusion.
- (vi) ADB should aim to widen options for TA.

137. The proposed medium-term strategy would build on ADB's long standing involvement in policy dialogue, but place it on a clearer footing and ensure that it becomes more visible as a contribution to the reform process. It should be published, either through ADB's country strategy or, if that is not a suitable vehicle, through another mechanism so as to encourage public debate on the issues. It should have the following components:

- (i) It should acknowledge that investments needs in the sector could amount to \$2 billion per annum and could rise further over time and explain that an overarching objective of the strategy is to enable Pakistan, with ADB assistance, to meet that investment need.
- (ii) It should indicate a willingness to consider even very large projects, such as multi billion hydro electric projects which Pakistan is considering, provided of course that projects are properly appraised and adequate safeguards are in place. The Pakistan government has already approached the World Bank seeking support for a \$10 billion program of funding for hydroelectric projects spread over the next 15 to 18 years. It would add to the credibility of such a program if ADB offered commitments alongside the World Bank.
- (iii) It should stress that assistance is conditional on continuing reform and on adopting commercial principles for the sector as a whole and for individual companies.
- (iv) It should articulate a structural vision for the future of the power sector, whereby there would be a competitive market with all consumer groups contestable by different suppliers. Both generation and distribution would generally be privatized. However, it would acknowledge that achievement of this vision would probably be outside the 3 to 5 year time frame of the strategy. Privatization of some aspects of distribution may not be feasible or desirable for much longer.
- (v) It should emphasize that ADB is prepared to be flexible in the areas that it supports, provided that they match with the strategy. If, for example, a distribution company is clearly mismanaged, and hence not commercial, then ADB should state that the company will not qualify for its support.
- (vi) It should include an outline of planned investments and expected progress on sector reform over the 3- to 5-year period.
- (vii) It should cover other aspects of ADB's energy policy such as promoting energy efficient practices, clean air mechanisms and high environmental standards.

138. The strategy document could be initiated by ADB. However, it should be developed and discussed with government before finalization. ADB needs to be confident that the strategy enjoys broad government support before publishing it. The Government could be invited to offer its formal reaction in a section of the strategy document or through its annual development planning activities.

139. The strategy should be supported by an annual lending and evaluation framework, which should also be made public. The lending framework would suggest amounts to be lent over the following year and projects that would be supported. It would also detail objectives to be met for the following year relating to sector reform. These objectives would be specific, measurable,

achievable, results oriented and timebound. If such a framework were being put in place today, the objectives would probably relate to the creation of independent and commercial distribution companies, the establishment of a financial viable single buyer, resolving the role of government in providing subsidy and achieving an appropriate regulatory balance between the interests of customers and investors. These are the four major issues that currently impede completion of the new single buyer market. From the second year onwards, the framework would include an evaluation of sector performance over the previous year. Available funding for the following year would be adjusted up or down depending on both performance for the previous year and the commitments to change for the forthcoming year.

140. An exchange of letters between ADB and the Government would probably be the simplest way of making this framework effective. Each side would set out its commitments and plans in the light of the evolving policy environment. Drafts of the proposed letters would be exchanged between the two sides before finalization to ensure consistency of approach.

141. These proposals are not meant to create an environment in which every aspect of power sector dialogue between government and ADB is made public. Sometimes confidentiality is vital to ensuring an open exchange of views and there are many detailed aspects of these sorts of discussions, which it would be inappropriate to make public in this way. The content of any public documents need not go significantly beyond the sort of information that appears in RRP's and in commitments that government makes from time to time to development partners and in its own published plans.

142. Documenting the policy dialogue in this way would help to address the risk that the present project officer might move on to another role. His continuity of involvement has been a significant factor in ensuring the quality and consistency of ADB's approach. Documenting the dialogue would make it easier to pass responsibility on to a successor in due course.

143. The investment needs of Pakistan's power sector are substantial. For the next few years, annual investment of \$700 million to \$2 billion may be needed in generation. ADB and other development partners cannot meet these needs in full. At the same time, international private investors are showing only limited enthusiasm for new power projects in developing countries. ADB's private sector operations can play a critical role in providing funding which leverages other capital investment from both local and international investors, thus increasing the overall resources available to the sector. In the medium term, private investment may also be able to support projects in distribution companies.

144. The overall effectiveness of the assistance program could be enhanced by strengthening the capability of ADB's Pakistan Resident Mission for policy and other dialogue in the power sector. The World Bank office in Islamabad already has two energy specialists and they enable the World Bank to be in more regular contact with the local power sector and to influence developments in country on a day-to-day basis. The ADB mission in Dhaka, Bangladesh also has a resident energy specialist who plays a significant role in managing ADB's energy sector program. ADB should explore the job descriptions and jobholders for these positions and define a similar role in its Islamabad office. The eventual recruit would almost certainly be a Pakistani national with significant energy sector experience. The position should probably be filled by a new recruit as ADB lacks any energy specialist in the office at present. However, this proposal need not mean additional staff in the Pakistan mission office but may be achievable by restructuring of responsibilities between staff members. The specialist would need continuing support from ADB headquarters and elsewhere on the technical aspects of the reform program.

145. The implications of these proposals for staffing at ADB's headquarters should be quite limited. There should be some time savings on day-to-day tasks from having an energy specialist based in the mission in Islamabad. On the other hand, the proposed medium term strategy will require additional efforts from headquarters staff. The strategy will be documenting a dialogue that already takes place and hence the extra resources needed should be small. A potentially more significant issue is the implications of an increased lending program. In the mission's opinion, an ADB lending program of \$200 million per annum (equivalent to about 10% of Pakistan's power sector's annual investment needs) would necessitate additional staff resources.

146. Power sector investment is vital to helping the poor in the long term as it is a precondition for industrial and other development. ADB has also actively sought to help poorer consumers through agreeing a lifeline tariff for small power consumers. Distribution networks have been extended progressively in rural areas. However, the mission believes that ADB could be more aggressive in trying to help poorer consumers, for example by providing additional support for rural electrification. A previous World Bank loan for this purpose had disappointing results but nevertheless ADB should consider activities in this area. The alternative energy program may produce suitable opportunities for funding off grid electrification projects. Alternatively, consideration might be given to supporting rural power cooperatives along the lines of similar institutions in Bangladesh. Investment should take place in locations where the capacity of generation and transmission resources is sufficient to ensure that services can be provided reliably.

147. ADB has a fine record of supporting reform through well thought out TA interventions. The Pakistan government has valued these interventions and been willing to borrow in order to access TA. However, this attitude may be changing, with a greater stress on investing borrowed money in productive assets. This development coincides with a downward trend in the amount of grant resources that ADB will be able to offer for TA in the sector. Pakistan has a clear continuing need for TA in order to progress its reform program. ADB should therefore endeavour to locate further sources of TA funds through bilateral donors.

148. In the recent past, TA has been provided almost exclusively through consultancy. In some cases, consultants may not be able to give the sort of hands on experience that is needed to, for example, NEPRA. Consideration should therefore be given to a wider range of TA options such as twinning (whereby NEPRA might be twinned with a developed country regulator) to provide support through next stages of reform.

## ELECTRICITY INDICATORS IN PAKISTAN

Item	Fiscal Year Ending 30 June									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Installed Capacity (MW)</b>										
Public Hydel	4,725	4,825	4,825	4,825	4,825	4,825	4,825	5,009	5,009	5,009
Public Thermal	4,926	5,738	6,238	5,070	5,070	5,070	4,871	4,741	4,741	4,741
Private Hydel			0	0	0	0	0	30	30	30
Private Thermal			0	3,061	3,788	3,905	4,748	5,430	5,715	5,715
Nuclear			0	0	0	0	0	325	325	325
<b>Total</b>	<b>9,651</b>	<b>10,563</b>	<b>11,063</b>	<b>12,956</b>	<b>13,683</b>	<b>13,800</b>	<b>14,444</b>	<b>15,535</b>	<b>15,820</b>	<b>15,820</b>
Addition during the year (MW)	1,529	912	500	1,893	727	117	644	1,091	285	0
<b>Energy Generation</b>										
Public Hydel	19,436	22,858	23,206	20,858	22,060	22,448	19,288	17,196	18,941	22,253
Public Thermal	22,960	23,268	25,492	19,184	17,619	15,909	19,157	16,858	18,684	19,646
Private Hydel								63	115	97
Private Thermal			161	10,740	13,580	15,326	17,428	24,338	23,120	22,044
Nuclear										
<b>Total</b>	<b>42,396</b>	<b>46,126</b>	<b>48,859</b>	<b>50,782</b>	<b>53,259</b>	<b>53,683</b>	<b>55,873</b>	<b>58,455</b>	<b>60,860</b>	<b>64,040</b>
Maximum Demand (MW)	8,067	8,252	8,278	8,552	8,825	9,192	9,289	9,718	10,108	11,044
Energy Sales (GWh)	32,131	35,032	36,925	38,529	39,422	38,900	40,910	43,384	45,204	47,421
Number of Consumers ('000s)	8,592	9,067	9,482	9,869	10,217	10,800	11,585	12,166	12,678	13,318
Villages Electrified	50,927	57,170	62,127	64,568	65,951	67,183	68,292	69,887	71,561	73,807
<b>Losses (%)</b>										
Auxilliary	2.6	2.6	2.9	2.4	2.0	1.7	2.2	2.0	2.2	2.1
Transmission	8.8	7.6	7.7	8.2	8.5	7.8	7.2	7.9	7.8	7.8
Distribution	12.8	13.9	13.8	13.5	15.5	18.0	17.4	15.9	17.7	17.9
<b>System Losses</b>	<b>24.2</b>	<b>24.1</b>	<b>24.4</b>	<b>24.1</b>	<b>26.0</b>	<b>27.5</b>	<b>26.8</b>	<b>25.8</b>	<b>27.7</b>	<b>27.9</b>

GWh = gigawatt-hour, MW = megawatt.

Source: Information collected by the Evaluation Team from various sources in the Pakistan power sector.

### KEY EVENTS IN THE PAKISTAN POWER SECTOR SINCE 1990

Year	Month	Event
1990	Dec	ADB approves WAPDA Eleventh Power Project loan
1991	Dec	ADB approves WAPDA Twelfth Power Sector (Project) Loan
1992	Jul	Government adopts "Strategic Plan for the Privatization of the Pakistan Power Sector"
1993	Oct	Prime Minister sets up High Level Task Force on the Energy Sector to draw up an outline for a new energy policy
1994		Creation of PPIB
1994	Mar	High Level Task Force reports
1994	Apr	Government announces a comprehensive policy framework and package of incentives to encourage private sector participation in power generation
1994	Sep	ADB approves KESC sixth power sector loan of \$200 million
1995		Government introduces complementary policies to promote private finance in hydro power and transmission
1995	Oct	Publication of "Energy Policy of Asian Development Bank"
1996	Jan	ADB approves Ghazi Barotha loan of US\$300m
1996		Partial privatization of Kot Addu Power Plant Company
1997	Dec	National Assembly passes NEPRA Act
1998	Apr	Cabinet approves new power policy, requiring competitive tendering for new IPPs.
1998	May	Nuclear tests lead to sanctions against Pakistan
1998	Sep	Partial cancellation of KESC sixth power sector loan
1998	Nov	Government approves financial package for restructuring of KESC
1998	Dec	WAPDA Act amended to permit establishment of PEPCO and unbundling of WAPDA
2000	Aug	Government approves Privatization Law
2000	Nov	Government commits to energy sector restructuring program as part of ADB loan negotiations
2002		Government introduces new power policy with additional tax incentives and clearer organizational framework
2002	Apr	Financial Improvement Plan for the power sector agreed between government and multilateral financial institutions
2003	Feb	Government sends letter of intent to IMF detailing planned financial reforms in the power sector
2003	May	Government establishes Alternative Energy Development Board and sets target of 10% renewable energy in energy mix by 2015.
2003	Aug	Inauguration of Ghazi Barotha hydropower project
2005	Feb	Offer for sale of KESC
2005	Jun	Winning bidder fails to complete purchase of KESC
2005	Dec	KESC sold to Hassan Associates

ADB = Asian Development Bank, IMF = International Monetary Fund, IPP = independent power plant, KESC = Karachi Electric Supply Corporation, PEPCO = Pakistan Electric Power Company (Private) Limited, PPIB = Private Power and Infrastructure Board, WAPDA = Water and Power Development Authority.

## POWER POLICY OF THE PAKISTAN GOVERNMENT

1. The Pakistan government has issued three significant policy statements on the power sector in recent years. All of them have been designed to attract private finance for generation projects. The 1994 power policy was the first such statement by the government of Pakistan and the policy was designed with assistance from the World Bank. Implementation of the policy was the responsibility of the Private Power and Infrastructure Board (PPIB). Investors were offered a guaranteed price for power supplies through a bulk supply tariff and were able to make their own proposals about the technology and fuel to be used. The thermal projects were constructed under build-own-operate (BOO) arrangements. The Water and Power Development Authority (WAPDA) and Karachi Electric Supply Corporation (KESC) were purchasers of the power under long-term contracts. But the federal government gave guarantees over payment obligations and convertibility. Investors also received tax incentives through exemption from income, sales and other taxes.

2. The policy achieved some successes. There were investments of \$3 billion in the power sector and numerous international power companies entered the Pakistan market. However, the policy only attracted thermal projects and some of the projects were in unsuitable locations. Subsequent policy changes aimed to attract more investment into hydro and transmission projects but these proved less successful.

3. Policy was changed considerably in 1998, with assistance from the Asian Development Bank. Under the new policy, bidders were expected to tender through international competitive bidding on the basis of power tariffs. Selection would be based on the minimum levelized tariff. Detailed feasibility studies would be prepared before the bidding. Unsolicited proposals would be permitted from project sponsors in the absence of feasibility studies for projects. Implementation was under the BOO model for thermal projects and the build-own-operate-transfer (BOOT) model for hydro projects. There were some tax incentives but fewer than in 1994. The Government continued to provide payment and other guarantees. Provincial governments were involved as well as the federal government.

4. The policy did not attract any investment. Neither the environment in Pakistan nor the international power sector environment was conducive to investment at this time. A number of IPPs were in dispute with government because of requests for reductions in their tariffs.

5. In 2002, the Government announced a further new policy structure designed to be more investor friendly. The arrangements are broadly similar to the 1998 policy. However, there are additional tax incentives for investors. In addition, responsibility for projects of over 50 MW now rests unambiguously at the federal level, with all projects passing through a one-window facility with the PPIB. Smaller projects of fewer than 50 MW are the responsibility of the provinces.

6. Other aspects of government policy have stayed broadly consistent over the past decade. For example, the thrust of the Government's policy as outlined in the Seventh Five-Year Plan (FY1999 to FY1993) was directed at resource mobilization for energy investment, efficient substitution of domestic energy for imported products, and the management of energy demand through appropriate pricing policies. The main objectives within the power subsector were:

- (i) To substantially increase electricity supply to sustain the project growth in the economy, eliminate load shedding and electrify most of the rural areas through

accelerating the exploration and development of domestic oil, coal, gas, hydroelectric and renewable resources.

- (ii) To reduce power system losses and to establish an efficient load management system.
- (iii) To draw upon the financial resources and expertise of the private sector and to strengthen the financial capacity of the concerned utilities to self-finance investment programs and to reduce the burden on government resources.

7. The impacts of changes in the Eighth Five-Year Plan (FY1994 to FY1998) were minimal. The stated objectives in that plan were to (i) accelerate the development of domestic energy resources such as large and small hydro sites, oil, gas and coal as part of the least cost energy investment program; (ii) reduce the losses in the production and transport of energy through the rehabilitation and retrofitting of power system facilities, refineries and energy intensive industries; (iii) restrain the growth in energy demand through demand side measures and investments to improve energy efficiency and conservation; (iv) strengthen the operations and management of sector institutions including building up their environmental managerial capability and (v) accelerate the process of restructuring and privatizing the energy sector to make it more competitive and efficient.

8. There are few differences between this statement and the intentions set out in the plan for 2005/06. The government is now pursuing a policy to enhance power generation by harnessing more indigenous resource based generation like hydroelectric, coal and gas etc. In order to improve the hydroelectric/thermal mix towards more hydroelectric, a greater number of hydroelectric projects have been approved for implementation. The plan also refers to improved sectoral efficiency, institutional strengthening, an enhanced role for the private sector and the benefits of KESC privatization. There are plans to improve transmission in order to ensure a stable and uninterrupted power supply, to reduce system losses and to connect new consumers to the grid, particularly in villages.