



Extended Annual Review Report

Project Number: 40943
Loan Number: 2329
Equity Investment Number: 7254
September 2014

Equity Investment and Loan Karachi Electric Supply Company Post-privatization Rehabilitation, Upgrade, and Expansion (Pakistan)

This is the abbreviated version of the document that excludes commercially sensitive and confidential business information that is subject to exceptions to disclosure set forth in ADB's Public Communications Policy 2011.

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – Pakistan rupee/s (PRe/PRs)

		At Appraisal	At Project Review
		25 April 2007	31 March 2014
PRe1.00	–	\$0.0165	\$0.0102
\$1.00	–	PRs60.66	PRs98.06

ABBREVIATIONS

BQTPS	–	Bin Qasim Thermal Power Station
EBITDA	–	earnings before interest, taxes, depreciation, and amortization
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
HSEQ	–	health, safety, environment, and quality
IBC	–	integrated business center
IFC	–	International Finance Corporation
KEL	–	K-Electric
KESC	–	Karachi Electric Supply Company
KTPS	–	Korangi Thermal Power Station
O&M	–	operation and maintenance
PEPCO	–	Pakistan Electric Power Company
WAPDA	–	Water and Power Development Authority

WEIGHTS AND MEASURES

GWh	–	gigawatt-hour
km	–	kilometer
kV	–	kilovolt
MW	–	megawatt

NOTES

- (i) The fiscal year (FY) of the Government of Pakistan and most of Pakistan's public and private institutions and corporations ends on 30 June. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2013 ends on 30 June 2013.
- (ii) In this report, "\$" refers to US dollars.

Vice-President	L. Venkatachalam, Private Sector and Cofinancing Operations
Director General	T. Freeland, Private Sector Operations Department (PSOD)
Director	D. Purka, Infrastructure Finance Division 1, PSOD
Team leader	S. Kondo, Investment Specialist, PSOD
Team members	R. de Leon, Associate Investment Officer, PSOD
	S. Durrani-Jamal, Senior Economist, PSOD
	M. Hashimi, Investment Specialist, PSOD
	M. Manabat, Senior Investment Officer, PSOD
	J. Munsayac, Safeguards Specialist, PSOD
	A. Porras, Senior Safeguards Officer, PSOD
	M. Principe, Senior Safeguards Officer, PSOD

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BASIC DATA
KESC Post-privatization Rehabilitation, Upgrade, and Expansion
(Loan No. 2329 – Pakistan; Equity Investment No. 7254 – Pakistan)

Key Dates	Expected	Actual
Concept Clearance Approval	Dec 2006	7 Dec 2006
Board Approval	Mar 2007	29 May 2007
Loan Agreement	Apr 2007	4 Jun 2007
Loan Effectiveness	2008	16 Jul 2008
First Disbursement	2008	29 Jul 2008
Final Disbursement	2009	23 Dec 2011
Loan Closing	Dec 2009	Dec 2011
Loan Reprofiling Approval		18 Jan 2010
Partial Prepayment and Conversion of Loan to Equity	Dec 2010	18 Dec 2012
Commercial Operations Date	Aug 2008 (KTPS) Jan 2012 (BQTPS)	Sep 2009 (KTPS) April 2012 (BQTPS)

BQTPS = Bin Qasim Thermal Power Station, KTPS = Korangi Thermal Power Station.

Project Administration and Monitoring	No. of Missions	No. of Person-Days
Fact-Finding	2	46
Negotiation	2	28
Project Administration	20	88
XARR Mission	1	20

XARR = extended annual review report.

EXECUTIVE SUMMARY

In May 2007, the Board of Directors of the Asian Development Bank (ADB) approved a direct loan of \$150 million (or Pakistan rupee equivalent) to Karachi Electric Supply Company (KESC) to implement a turnaround plan following its privatization in 2005. The turnaround plan comprised (i) generation rehabilitation and expansion, (ii) transmission and network investments, and (iii) upgrading of commercial systems. To provide an enhanced yield for ADB's exposure, the project included a conversion option for ADB to subscribe for equity shares at a pre-agreed price using up to \$25 million of loan prepayment proceeds.

KESC's original sponsors and operation and maintenance (O&M) contractor were unable to successfully implement the turnaround plan. In September 2008, Abraaj Capital took management control over KESC and replaced the original O&M contractor with an Abraaj Capital-appointed team. With an established operational track record in large-scale turnaround investments, Abraaj Capital achieved the following: (i) 1,010 megawatts (MW) of new power generation capacity added, (ii) 10 new grids energized, (iii) 62 kilometers (km) of new transmission lines laid out, and (iv) 189 km of existing transmission lines rehabilitated. As of December 2013, KESC's average transmission and distribution losses of 26.33% were on track to hit a targeted 26.0% by December 2014, and its average collection ratio of 86.51% was on track to hit a targeted 92.0% by December 2014. The 220 MW combined cycle Korangi Thermal Power Station was commissioned in 2009, and the 560 MW combined cycle Bin Qasim Thermal Power Station was commissioned in 2012.

To implement KESC's turnaround, the undisbursed portion of ADB's loan was reprofiled in 2010. KESC achieved net profitability in June 2012, the first time since 1995, and it has since remained profitable. In December 2012, ADB exercised the pre-agreed conversion option and converted \$25 million of its loan to common shares because of KESC's success with its turnaround, and because the market price of the shares was considerably higher than the pre-agreed price. In January 2014, KESC officially changed its name to K-Electric (KEL).

The evaluation of ADB's investment in KEL is based on four main criteria: (i) development results, (ii) profitability of ADB's investment, (iii) quality of ADB's work, and (iv) ADB's additionality. An overall rating is derived from the underlying ratings of these four criteria.

Development results of the project are rated *excellent*. This aspect was evaluated using four categories: (i) contribution to private sector development and other ADB strategic development objectives, (ii) business success, (iii) contribution to economic development, and (iv) environmental, social, health, and safety performance.

The contribution to private sector development and other ADB strategic development objectives is rated *excellent*. The project demonstrated how private equity supported by long-term financing can create systemic improvements in a power utility and turn it from being a loss-making entity to being profitable in 2012. Some of KEL's initiatives are being replicated by other power utilities in Pakistan. Following KEL's successful privatization and turnaround performance, the Government of Pakistan intends to further divest its shares in various public sector entities. The project's business success is rated *excellent*. The project's contribution to economic development is rated *excellent*.

KEL's environmental, social, health, and safety performance is rated *satisfactory*. Key potential environmental impacts are continuously being mitigated and monitored at the corporate and power plant levels. Since the new thermal plants were developed on the sites of

existing thermal power stations, no endangered flora or fauna species were affected. Land acquisition was completed before the project's approval in 2007. An emergency response plan, including health and safety awareness training, is part of the safety management system strategies that positively contribute towards KEL's safety culture. KEL's practice of collaborating and partnering with nongovernment organizations and civil society groups is notable, ensuring effective ways of communicating with communities and implementing community programs.

Although the undisbursed portion of ADB's loan was reprofiled, the original loan maturity date was retained, which required KEL to make larger principal and interest payments. KEL has made all principal and interest payments on time. The equity subscription option provides ADB with additional compensation for the risks. Thus, ADB's investment profitability is rated *excellent*. ADB's work quality is also rated *excellent*. The project is fully in line with ADB's energy sector strategies. It served as an important example of the continuous support between the Central and West Asia Regional Department and the Private Sector Operations Department during the pre- and post-privatization phases of KEL. ADB also demonstrated flexibility in accommodating the changes necessitated by the reprofiling exercise. Without ADB's participation, the project would not have materialized; therefore, ADB's additionality is rated *excellent*. KEL's funding requirement was large and immediate, and the amount and the term of financing required were not available from the commercial banking or capital markets. ADB's presence also enhanced KEL's capability to mobilize financing in local markets. Overall, the project is rated *highly successful*.

The project's main issues were: (i) the original sponsors and O&M contractor were unsuccessful in implementing the turnaround due to a lack of experience in implementing required changes in a power company in a highly complex and politicized situation; and (ii) because the transaction was structured more as a project financing (but is in fact a corporate financing), a covenant limiting KEL's financial indebtedness was too restrictive in relation to the increase in KEL's assets. Thus, KEL has repeatedly requested waivers over extended periods causing some administrative burden.

The project also demonstrated the following features that could be replicated in designing new projects: (i) robust security through a debt servicing mechanism drawn from a master collection account, and (ii) an option to convert part of the loan into equity at a strike price (further reduced in 2010) that provided flexibility to choose between surety in loan repayment and risk compensation. The project was complex and challenging, and it required ADB to be heavily engaged as a financier with a fair degree of flexibility. This should be expected for any future investments by ADB in similar turnaround plans.

I. THE PROJECT

A. Project Background

1. Pakistan's continued and growing power deficit particularly impacts the city of Karachi, the country's industrial and commercial capital, which currently receives approximately 1,600 megawatts (MW) of electricity, or 11% of Pakistan's total power capacity. In 2006, the city faced a power deficit of 1,064 MW (or 67% of the city's total available power supply). Demand for power in Karachi has been increasing at an average rate of 8% per year since 2000.

2. In May 2007, the Board of Directors of the Asian Development Bank (ADB) approved a direct corporate loan of up to \$150 million (or Pakistan rupee equivalent) to Karachi Electric Supply Company¹ (KESC) to support KESC's comprehensive capital investments in its generation, transmission, and distribution infrastructure. ADB's financing was fully disbursed in US dollars and is without government guarantee.

3. KESC is the only vertically integrated power utility in Pakistan and is solely responsible for the generation, transmission, and distribution of electricity to Karachi and surrounding areas, servicing about 2.2 million customers. It is the first and only privatized integrated utility in Pakistan. Privatized in late 2005, it remained a loss-making utility (from 1996 to 2011) suffering from a lack of power generating facilities, poor quality transmission and distribution networks, and frequent service disruptions on account of insufficient capacity investment and weak corporate governance.

4. During 1995 to 2005 (the last decade of state ownership), there was limited capacity investment in KESC. Due to poor maintenance and obsolescence of existing plants, KESC's generation capacity was derated² and thermal efficiency stood at 25%. Its transmission and distribution network suffered from poor maintenance and overloading as a result of underinvestment and poor management systems and controls. Transmission and distribution losses were high at 35%, half of which were due to outright power theft (e.g., illegal connections and meter tampering).

5. The Government of Pakistan decided to privatize the utility to improve KESC's performance and infuse private capital and expertise into KESC. After its privatization, KESC embarked on an urgent and comprehensive turnaround strategy based on (i) generation rehabilitation and expansion, (ii) transmission and distribution network investments, and (iii) upgrading of commercial systems.³ To implement its strategy, KESC refocused its activities and brought in new management resources. KESC asked ADB to take a leading role in funding its turnaround strategy, as a continuation of ADB's pre-privatization support for KESC's transition from a state-owned enterprise to a private sector company.⁴ Aside from ADB, KESC also sought funding support from the International Finance Corporation (IFC) and major local banks.

6. Effective 19 January 2014, KESC officially changed its name to K-Electric (KEL) as part of the company's rebranding to mark its 100th year of incorporation.

¹ Formerly Karachi Electric Supply Corporation. The change from "corporation" to "company" was implemented in 2010.

² Derating means operating a plant at less than its rated maximum power in order to prolong its life.

³ Including upgrading commercial information technology infrastructure and improving customer service centers.

⁴ By the time of KESC's privatization in late 2005, KESC had received a total of six sector loans from ADB for approximately \$350 million, and five technical assistance projects worth \$1.7 million.

B. Key Project Features

7. KEL's turnaround strategy had multiple aspects: (i) existing generation facilities were to be rehabilitated to increase power generation by 220 MW; (ii) two new combined cycle, dual-fuel plants—the 220 MW Korangi Thermal Power Station (KTPS) and the 560 MW Bin Qasim Thermal Power Station (BQTPS)—were to provide 780 MW of incremental generation capacity; and (iii) the transmission and distribution network would be modernized to allow discharge of additional power via new investments in grid stations, newer lines, and real-time, state-of-the-art supervisory control and data acquisition system management. Reduced technical losses would translate into additional revenues and satisfied customers for KEL.

8. Through this project, ADB intended to demonstrate to the government (and to other governments of developing member countries) that large-scale utility privatizations in a megacity such as Karachi can be successfully managed from the planning stage to a stage where operations are private sector-led and sustainably financed.

9. To boost overall potential yield and provide additional compensation for the risks borne by ADB and IFC, both lenders were given the right to subscribe to up to \$25 million each in equity shares at a predetermined price until December 2012. Quarterly debt servicing for the senior debt is drawn from a master collection account of KEL, where payments of electricity bills of KEL's largest regularly paying customers are accumulated.

C. Progress Highlights

10. In December 2005, the government sold 72.17% of its stake in KEL to two original sponsors: Al-Jomaih Holding, a large and well-established Saudi conglomerate, and National Industries Group, one of the largest industrial conglomerates in Kuwait. The original sponsors made an initial equity investment in KES Power, a company established for the sole purpose of investing in KEL. Siemens was appointed as a technical contractor for the operation and maintenance (O&M) of KEL.

11. After 3 years of operations, the original sponsors and Siemens were not able to implement KEL's turnaround strategy successfully. Construction of the KTPS plant was beset by delays caused by serious design issues, force majeure events, and the political situation in Pakistan. No progress had been made on the construction of BQTPS. Siemens' management team could not reduce transmission and distribution losses as projected, causing substantial losses to KEL. Higher implementation costs increased pressure on working capital. Yearly cash losses eroded the recent equity investment. The public and the government grew more and more frustrated as electricity load shedding increased.

12. In early 2008, the original sponsors approached Abraaj Capital⁵ to join as a partner in KES Power and invest in KEL. After a thorough appraisal of KEL, Abraaj Capital agreed in June 2008 to invest into KES Power and become KEL's majority shareholder. In September 2008, Abraaj Capital took over the management of KEL, replacing the executive management team with full-time Karachi-based experts in electric utility turnarounds. The original O&M contractor, Siemens, was replaced by an Abraaj Capital-appointed team. ADB and IFC engaged in discussions with Abraaj Capital in September 2008, and both organizations reviewed Abraaj

⁵ Abraaj Capital is a private equity firm focused on investing in emerging markets, specifically the high growth economies of the Middle East (including Turkey), North Africa, and South Asia (India and Pakistan). Founded in 2002 and headquartered in Dubai, United Arab Emirates, Abraaj Capital has over \$6.6 billion in funds under management.

Capital's investment program to turn KEL around, as well as the capability of the new management team. Despite the failures of the previous management and the challenging political and economic environment, ADB and IFC felt that Abraaj Capital was the right partner to pursue the turnaround strategy, especially since Abraaj Capital had an established operational track record in large-scale turnaround investments.⁶ Upon consent by ADB and IFC, Abraaj Capital acquired 50% of the shares in KES Power through one of Abraaj Capital's investment vehicles, Infrastructure and Growth Capital Fund Special Purpose Vehicle 21, which infused equity into KEL in tranches within 3 years until April 2012. The sponsors from the original privatization still hold 50% of the shares in KES Power.

13. Under Abraaj Capital management, KEL set forth a revised capital expenditure and financing plan to revamp its turnaround strategy. The initial estimated project cost under the original sponsors' business plan increased on account of additional capital expenditures for the construction of two 90 MW Jenbacher gas turbine thermal power stations, the conversion of these plants into combined cycle mode, and the construction of more transmission and distribution facilities. More capital expenditures were also targeted for the rehabilitation of existing generation, transmission, and distribution facilities. All these plans required significantly more working capital.

14. The construction of KTPS was brought back on track under the new management. KTPS became fully operational in September 2009, a year behind the original schedule. For BQTPS, the engineering, procurement, and construction contract was awarded, on a turn-key basis, by KEL to Harbin Power Equipment, a Chinese contractor, in May 2009. No delays in construction were experienced, and the plant was fully commissioned in April 2012. These two new thermal plants improved KEL's overall generation efficiency.⁷

15. Aside from these generation projects, Abraaj Capital also effected transmission upgrades, including transformer capacity increases and the implementation of supervisory control and data acquisition systems, in about 60 KEL transmission grids by December 2009. Network reliability and system availability were improved with the completion of the 220-kilovolt (kV) distribution ring around Karachi, bringing on-line new grid substations. Since Abraaj Capital took over KEL management, 10 new grids of 132 kV and 11 kV have been energized, 62 kilometers (km) of new transmission lines have been laid out, and 189 km of existing transmission lines have been rehabilitated. New and rehabilitated transmission lines are of 220 kV and 132 kV.

16. To allow KEL additional flexibility in implementing its turnaround strategy, it was necessary to reprofile the undisbursed portion of the ADB and IFC loans, with the disbursed amounts maintaining the original payment terms.⁸ A new repayment schedule was put into place that was synchronized with the anticipated increase in earnings after the completion of the 560 MW BQTPS, although the final maturity of the reprofiled loan remained the same as the original loan. To compensate for the flexibility granted to KEL, ADB received additional commercial premiums: (i) the interest rate margin of the ADB loan was increased; (ii) the \$25 million equity conversion option availability was extended to December 2012; and (iii) the predetermined

⁶ In 2007, Abraaj Capital executed the largest leveraged buyout to date when it purchased Egyptian Fertilizers Company and successfully exited less than a year later.

⁷ Generation efficiency is the ratio between the useful electricity output from the generating unit during a specific time period and the energy value of the energy source supplied to the unit in the same time period.

⁸ In July 2008, ADB disbursed \$50 million. This tranche was not reprofiled. Only the undisbursed balance of \$100 million was reprofiled and then disbursed between June 2010 and December 2011.

share price for the equity conversion was reduced, offering greater financial upside for ADB. ADB's Investment Committee approved the loan reprofiling in January 2010.

17. In December 2012, ADB exercised the equity conversion option in full. KEL prepaid \$25 million of its loan, and the prepayment proceeds were invested back by ADB as equity as provided for in the pre-agreed conversion mechanics. ADB's equity investment represents a 2.53% stake in KEL as of 31 March 2014, without any lock-up period.

II. EVALUATION

A. Project Rationale and Objectives

18. As set out in the report and recommendation of the President,⁹ the project aimed to (i) address an immediate and accelerating energy crisis in Karachi, and help address a growing energy deficit in Pakistan; (ii) introduce higher energy efficiency into KEL, which was one of Pakistan's least efficient power utilities; (iii) and support private sector development. As the first large-scale infrastructure privatization in Pakistan, the success or failure of KEL will have major implications for future privatizations.

19. These objectives were achieved by the project. KEL's own generation capacity increased from 1,336 MW at privatization in December 2005 to 2,341 MW as of June 2013. Around 54% of the energy distributed by KEL goes to customers without any service interruption, while the remaining customers experience scheduled load shedding of 3–6 hours a day, depending on the neighborhood's payment and loss profile.¹⁰ This is much better than in other parts of the country (including the capital city of Islamabad), where load shedding averages 8–10 hours per day. Strategic installations (such as those in water pumping stations and hospitals) and major industrial zones have been exempt from load shedding. KEL's transmission and distribution losses decreased from 35% in June 2006 to 26% in December 2013.

20. KEL's privatization led to Abraaj Capital's participation as a foreign direct investor. Abraaj Capital's significant equity injection demonstrated its long-term commitment to transforming KEL into a world-class private utility. Its successful efforts to turn around the business showed the viability of foreign direct investments in Pakistan's infrastructure sector. The success of KEL's privatization spurred the government to pursue privatization of more state-owned entities, and it is now set to implement the country's largest-ever privatization program.

B. Development Results

21. Development results of the project are rated *excellent*. The results were evaluated according to (i) contribution to private sector development and other ADB strategic development objectives, (ii) business success, (iii) contribution to economic development, and (iv) environmental, social, health, and safety performance.

⁹ ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Islamic Republic of Pakistan for KESC Postprivatization Rehabilitation, Upgrade, and Expansion*. Manila.

¹⁰ Neighborhoods with good paying customers are classified as low loss areas, and these do not have any power interruptions. Other areas that are classified as medium loss, high loss, and very high loss experience power service interruptions.

1. Contribution to Private Sector Development and Other ADB Strategic Development Objectives

22. The project demonstrated how private equity supported by long-term debt financing can create widespread improvements in a loss-making power utility. Through the investment and professional management of Abraaj Capital, supported by long-term debt financing, KEL successfully transitioned from a loss-making state-owned entity to a privatized company that achieved profitability for the first time in 17 years in June 2012.

23. Upon assuming management of KEL, Abraaj Capital (i) targeted capital expenditures to improve overall system efficiency, (ii) rationalized the tariff structure¹¹ to improve cash flow management, and (iii) aimed to improve the public's dim view of the company through customer focus groups.¹² Following a voluntary separation scheme, noncore activities were outsourced to reduce operating costs to allow the company to focus more intently on core activities. KEL's customer-to-employee ratio increased from 143:1 to 221:1.

24. Reductions in transmission and distribution losses translated into additional revenues and cut KEL's net losses. To reduce opportunities for power theft, the following initiatives were introduced: (i) the use of aerial bundled cables, which are coated to prevent illegal hook connections; (ii) the connecting of customer lines to elevated pole-mounted transformers, which makes it easy to determine line losses; and (iii) the use of electrostatic meters that cannot be tampered with.

25. The integrated business center (IBC) concept,¹³ which segregated geographic service areas and made each a profit center, was a new way to operate the business of KEL. Introduced in April 2009, it was a cornerstone of the turnaround plan because it addressed the challenge of losses relating to residential customers. IBCs led to improvements in service quality, a reduction in billing and power outage complaints, and reduced response times, resulting in greater acceptance of KEL by the public. By 2012, IBC coverage exceeded 80% of billable customers, and 17 of the 28 IBCs currently have a recovery rate of over 97.1%, representing over 80.1% of KEL's total revenue. For the remaining 11 IBCs, which are in areas with high theft and weak law and order, KEL has started contracting distribution service providers that are prominent businesses in these areas. Through the distribution service provider arrangement, KEL is given access to these high security risk areas.

26. KEL also successfully implemented a segmented load shedding (service interruption) model. Demand patterns for Karachi were segmented, which revealed that only 33% of the city was causing half of the transmission and distribution losses due to power theft. KEL therefore based its load shedding decisions on a neighborhood's payment and loss profile, so that those with low levels of power theft and good payment records (almost 54% of Karachi) are exempt from load shedding. KEL offers to share information on its initiatives with other power

¹¹ Under a multiple year tariff regime, KEL's tariff is performance based. It makes a return through reduction in transmission and distribution losses, and improvement in plant efficiency.

¹² A series of open house sessions allowed customers to meet face-to-face with KEL senior management, including the chief executive officer, and vent concerns and frustrations, often resulting in immediate resolution. At least 2,000 consumer queries were addressed through these forums.

¹³ The first IBC was established in Karachi's Defense neighborhood with 80,000 covered consumers. Segregating geographic service zones made it easier for KEL to match bill payments against power units sold. Transmission and distribution losses in Defense decreased from 33% in April 2008 to 16% in April 2009. The IBC offers consumers a 24-hour, one-window facility for all connection, billing, and payment queries. IBCs were organized as self-contained "profit centers," where accountability for losses, collections, productivity, and profitability of the area rests with the IBC head.

distribution companies in the country, and KEL's segmented load shedding model is being replicated by the Peshawar Electric Supply Company, which serves over 2.6 million consumers and has transmission and distribution losses as high as 36%. Other power distributors in Islamabad, Multan, Hyderabad, and Lahore are expected to follow suit to reduce losses and improve their efficiency.

27. KEL's post-privatization turnaround project has led to more foreign and local market financing. In 2010, during the loan reprofiling, the Austrian export credit agency Oesterreichische Kontrollbank Aktiengesellschaft provided KEL financing for two 90 MW thermal power stations running on Jenbacher engines. Local commercial banks also provided funding to KEL at reprofiling. In May 2012, during KEL's first attempt to access local capital markets, it successfully launched and raised PRs2 billion through term finance certificates to refinance its short-term borrowings. In February 2014, KEL launched *sukuk* (Islamic bonds) worth PRs6 billion, which were fully subscribed in 12 business hours. These instances demonstrate that privatization of KEL attracted lenders and investors in local debt and equity markets, underpinning future capital raising activities.

28. The project created direct temporary or permanent employment of local people, for skilled and semi-skilled work. During the construction of KTPS, an estimated 270 workers were employed. The plant's O&M is being handled by 120 employees. For BQTPS, an average of 755 workers (430 Chinese workers supplied by Harbin Power Equipment and 325 locals) worked at the construction site from January 2010 to March 2012, reaching a peak of 1,530 construction personnel (814 Chinese and 716 locals) from April to May 2011. Training in China was provided to 30 KEL employees for skills required to operate and maintain BQTPS. There were 25 new KEL positions created during the construction of BQTPS, and upon full commissioning, 139 new KEL positions were created and filled. Currently, the plant's O&M is undertaken by 215 employees.

29. Following KEL's successful privatization, the government is set to implement the country's largest-ever privatization program, involving 68 public companies, including Pakistan State Oil, Sui Southern Gas, Pakistan International Airlines, Pakistan Steel Mills, and various power distribution companies. In June 2014, the government sold its 19.8% stake in United Bank. In FY2015, the government is looking at a partial divestment of its shares in Pakistan Petroleum, and Oil and Gas Development Company. By December 2014, the government also intends to divest its shares in Habib Bank and Allied Bank. The privatization of these companies is expected to bring in intellectual and financial equity, as well as much-needed private investment into the country.

30. The impact of the project on private sector development and ADB strategic development objectives is rated *excellent* (Appendix 2).

2. Business Success

31. The turnaround strategy being implemented by Abraaj Capital has resulted in financial profitability for KEL, despite a lack of stable gas supply and circular debt plaguing the whole power sector. The loan by ADB to KEL was a corporate loan to finance the turnaround of KEL, which required capital expenditures for (i) generation rehabilitation and expansion, (ii) transmission and distribution network investments, and (iii) upgrading of commercial systems. In terms of business success, the project is rated *excellent*.

3. Economic Sustainability

32. Economic benefits are driven by the amount of power produced in KTPS and BQTPS, and hence available for consumption. In terms of economic sustainability, the project is rated *excellent*.

4. Environmental, Social, Health, and Safety Performance

33. As the project was classified as environment category B, preparation of an initial environmental examination was required by ADB. Social and environmental impact assessment reports were prepared by KEL. The “no objection clearance” for the project was issued by the Sindh Environmental Protection Agency on 9 July 2007. Other applicable government permits were secured, such as those under the Shop and Factories Act of 1934 and boiler licenses necessary for thermal power plant operations.

34. Key potential environmental impacts during operations such as air emissions, thermal discharge, wastewater effluent discharge, noise, and solid waste management are continuously being mitigated and monitored by KEL’s health, safety, environment, and quality staff, both at the corporate and power plant levels. Monitoring results show that all tested parameters comply with Pakistan’s National Environmental Quality Standards and international standards. KEL has obtained various international certifications and has integrated these into plant operations to further increase efficiency, minimize environmental impacts, improve health and safety performance, and ensure compliance with government regulatory requirements and international standards. An emergency response plan, including health and safety awareness training, is part of the safety management system strategies that positively contribute towards KEL’s safety culture. KEL is committed to maintain its good corporate environmental performance through compliance with local and international standards and adherence to its sustainability policy. Detailed information on the environmental impacts and mitigating measures is in Appendix 4.

35. The project is categorized as C for involuntary resettlement and C for indigenous peoples. Both KTPS and BQTPS were constructed on non-tribal lands, and land acquisition for both plants was completed long before the project’s approval. BQTPS was constructed on land within the existing power station site at Port Mohammad Bin Qasim Industrial Estate, Bin Qasim Town, District Malir, Karachi. KTPS was constructed within the existing plant site allotted for the establishment of power stations in Korangi, leased by the Ministry of Defense for 99 years from 1962.

36. BQTPS and KTPS have had positive social development impacts, including through providing employment opportunities to the local community and implementing social programs that benefit the community. KEL regularly collaborates and partners with nongovernment organizations and civil society groups to engage with local communities and implement community programs. Detailed information on social impact is in Appendix 5.

37. When the project was designed and approved by ADB in 2007, KEL did not foresee labor restructuring at the company. However, the new management led by Abraaj Capital triggered changes to ensure KEL’s achievement of its turnaround strategy, pursuing a large-scale labor restructuring. KEL conducted consultation meetings with labor unions on the planned labor restructuring, rationale, and compensation package to be offered. Despite strong resistance by labor unions, which filed lawsuits and organized violent protest actions against the company, KEL offered a voluntary separation scheme to its 4,300 noncore employees in late

2010 and also in July 2011 to allow more employees to avail themselves of the scheme. By February 2012, more than 3,000 noncore employees had availed themselves of the scheme. The remaining noncore employees were retrenched and offered the equivalent of 1 month's salary plus all the benefits that were available under the voluntary separation scheme. KEL has outsourced its security, bill distribution, and other noncore services. Initiatives have been undertaken to further train and develop remaining core staff capacity. KEL's preparation of the retrenchment plan and the voluntary separation scheme was in line with best practices.

38. While KEL is not aware of any labor issues or complaints from construction workers during the expansion of BQTPS and KTPS, KEL needs to keep and maintain records related to the monitoring of labor conditions and standards. ADB has requested that KEL continue to strengthen the record keeping and documentation of its operations and those of contractors and subcontractors. In line with KEL's sustainability policy and ADB's social protection strategy, KEL has also been requested to monitor its compliance with national labor laws and the International Labour Organization's core labor standards.

39. Overall, the project's environmental, social, health, and safety performance is rated *satisfactory*.

C. ADB Investment Profitability

40. ADB's investment profitability is rated *excellent*. The pricing of ADB's loan was identical to that agreed between KEL and IFC, and in line with the pricing proposed by the local commercial banks as well as other comparable transactions by ADB in Pakistan. An equity subscription option was added for further risk compensation.

41. In 2010, at the time of the loan reprofiling, the interest rate margin of the undisbursed portion of the ADB loan, amounting to \$100 million, was increased. However, final maturity of the loan remains unchanged even after the reprofiling.

42. KEL has made all principal and interest payments on time. While not yet realized, ADB's equity investment in KEL has substantially appreciated with the company's strong financial position.

D. ADB Work Quality

43. ADB's overall work quality is rated *excellent*, based on the project's (i) screening, appraisal, and structuring; and (ii) monitoring and supervision.

44. The project is consistent with ADB's country partnership strategy for Pakistan, which emphasizes the importance of infrastructure development and private sector participation.¹⁴ The project is also fully in line with ADB's energy sector strategy,¹⁵ with an emphasis on reducing poverty by creating energy infrastructure for sustainable economic growth and promoting private sector involvement by restructuring the sector. The project complements ADB's wider support to Pakistan's energy sector. Also, the project exemplified ADB support to KEL by the Central West Asia Regional Department before the privatization and by the Private Sector Operations Department post-privatization. ADB (together with other senior lenders) ensured debt servicing would be secured from a master collection account. Aside from this security structure, a

¹⁴ ADB. 2009. *Country Partnership Strategy: Pakistan, 2009–2013*. Manila.

¹⁵ ADB. 2000. *Energy 2000: Review of the Energy Sector Policy of the Asian Development Bank*. Manila.

negative covenant that limits KEL's financial indebtedness was also put in place. In the area of project screening, appraisal, and structuring, ADB's effectiveness is rated *satisfactory*.

45. Monitoring and supervision quality is rated *excellent*. During the reprofiling exercise and throughout the post-privatization activities, ADB demonstrated its flexibility to accommodate the necessary changes for the success of KEL's turnaround strategy, as well as to protect its investment. ADB keeps itself fully informed of project developments by maintaining close contact with KEL and its management, as well as through lenders' meetings and site visits. ADB also reacts promptly to waiver requests submitted by KEL, seeking clarification on the rationale before evaluating these requests. The frequency of these requests for waiver and/or consent requires constant monitoring of KEL's operational and financial performance. KEL's financial statements and reports are provided to ADB on a quarterly basis, and ADB prepares internal quarterly monitoring reports highlighting operational and financial performance, key risk issues, and development impact.

E. ADB's Additionality

46. ADB's additionality is rated *excellent*. Without ADB participation, the project would not have happened. KEL's funding requirement was large and immediate, and the amount and the term of financing required by KEL were in excess of funding available from commercial banks or capital markets in Pakistan. The fact that multilateral institutions, including ADB, provided financial assistance to the turnaround strategies of KEL provided comfort to financial institutions and investors from within and outside of the country for this and follow-on financings.

47. ADB's participation added value by continuing ADB's long-standing commitment to the successful privatization and turnaround of KEL, and by demonstrating to the government that large-scale megacity utility privatizations can be successfully structured from the planning stage to a stage where operations are private sector-led and sustainably financed.

F. Overall Evaluation

48. The overall evaluation is *highly successful*, as summarized below.

Table 1: Evaluation of KESC Post-privatization Rehabilitation, Upgrade, and Expansion

Indicator/Rating	Unsatisfactory	Partly Satisfactory	Satisfactory	Excellent
Development Impact				X
Private sector development				X
Business success				X
Economic sustainability				X
Environmental, social, health, and safety performance			X	
ADB Investment Profitability				X
ADB Work Quality				X
Screening, appraisal, and structuring			X	
Monitoring and supervision				X
ADB Additionality				X
	Unsuccessful	Partly successful	Successful	Highly successful
Overall Rating				X

ADB = Asian Development Bank.

III. ISSUES, LESSONS AND RECOMMENDED FOLLOW-UP ACTIONS

A. Issues and Lessons

49. **Sponsor commitment and capability.** The original sponsors and O&M contractor were unsuccessful in implementing the turnaround, due to a lack of experience in implementing required changes in a power company in a highly complex and politicized situation. Following privatization, challenges from the state ownership era remained within KEL, including a lack of proper investment in generation assets, inefficient plants, unmotivated human resources, and high transmission and distribution losses. KEL's turnaround was predicated on the commitment and expertise of Abraaj Capital, which had assumed management control from the original sponsors. Abraaj Capital immediately tackled priority issues and made the turnaround successful in a short period of time. Successful implementation of any post-privatization turnaround project requires financial and operational capability, extensive expertise in corporate turnaround, and a strong commitment to address related challenges.

50. **Robust security through a master collection account.** Debt servicing by KEL is drawn from a master collection account, where electricity bill payments from KEL's largest regularly paying customers are accumulated. This provides strong protection to the senior lenders. The likelihood of payment default is relatively low given the past payment pattern of these blue-chip companies to KEL. This robust security provided comfort to the senior lenders in financing KEL as it tackled a series of challenges in implementing the turnaround strategy.

51. **Administrative burden stemming from covenants.** Although it was a corporate financing, the transaction was structured more as a project financing. A covenant limiting KEL's short-term debt and excess payables to the government seems too restrictive given the steady asset growth of KEL, and its increased customer base. This covenant requires KEL to carefully manage the size of its short-term borrowing to finance its working capital as well as to balance government receivables and payables. KEL has repeatedly asked senior lenders for temporary waivers and an increase in the prescribed ceiling for extended periods, which has led to time consuming and costly processes to grant consent to such requests. Agreeing on a debt limit level that incorporates a buffer to reflect the asset size of the borrower in the near future may reduce this administrative burden.

52. **Conversion feature.** In December 2012, ADB exercised the option to convert part of the loan into equity at the original initial public offering price (further reduced in 2010). ADB's equity investment in KEL has since substantially appreciated with the company's strong financial position. A partial equity conversion feature provides flexibility to choose between surety in loan repayment and risk compensation.

53. **Committed team.** Throughout the process, from appraisal to monitoring and supervision of the transaction, the project team has been committed and engaged as a lender to, and later as a minor investor in, KEL. KEL management faced challenges during the implementation of the turnaround strategies that were complex and required prompt attention. At every juncture, the project team supported KEL based on the belief of the eventual success of the turnaround. In addition, the team was flexible while also maintaining the security of the loan. This level of commitment should be expected for future investments by ADB in similar turnarounds.

B. Recommended Follow-Up Actions

54. The safeguards team has recommended that KEL (i) strengthen its record keeping in monitoring labor conditions and standards for its own operations and those of contractors and subcontractors, and (ii) monitor its compliance with national labor laws and the International Labour Organization's core labor standards, in line with KEL's sustainability policy and ADB's social protection strategy.

PROJECT-RELATED DATA**A. Investment Identification**

1. Country Pakistan
2. Project Number, Investment Number, Loan Number 40943, 7254, 2329
3. Project Title KESC Post-privatization Rehabilitation, Upgrade, and Expansion
4. Borrower K-Electric (KEL), formerly known as Karachi Electric Supply Company (KESC)
5. Co-lenders Local commercial banks, International Finance Corporation, Oesterreichische Kontrollbank Aktiengesellschaft
6. Amount of Approved ADB Assistance \$150 million (tranche A: \$50 million, tranche B1: \$75 million, and tranche B2: \$25 million; with an option to convert tranche B2 into equity)
7. Environment Category B

B. Investment Data

1. Concept Clearance Approval 7 December 2006
2. Board Approval 29 May 2007
3. Signing Date of Loan Agreement 4 June 2007
4. Date of Loan Effectiveness 16 July 2008
5. Loan Disbursement Dates
 - Initial Disbursement 29 July 2008
 - Final Disbursement 23 December 2011
6. Loan Reprofitting Approval 18 January 2010
7. Partial Conversion of Loan to Equity 18 December 2012

C. Data on ADB Missions

Name of mission	Date	No. of person-days	No. of persons	Specialization of members
Fact-finding	January 2007	12	3	Principal Investment Specialist Investment Specialist Counsel
	February 2007	34	5	Principal Investment Specialist Investment Specialist Safeguard Specialist Investment Officer Counsel
Negotiation	February 2007	16	3	Principal Investment Specialist Investment Specialist Counsel

Project Administration	March 2007	12	2	Principal Investment Specialist Counsel
	May–June 2007	15	3	Principal Investment Specialist Investment Specialist Counsel
	June 2007	4	2	Investment Specialist Investment Officer
	October 2007	2	1	Investment Officer
	May 2008	2	1	Investment Specialist
	July 2008	2	2	Investment Specialist Investment Officer
	October 2008	4	1	Investment Specialist
	April 2009	2	1	Director
	August 2009	4	1	Investment Officer
	October 2009	3	1	Investment Specialist
	October 2009	3	1	Investment Specialist
	December 2009	4	1	Investment Specialist
	July 2010	4	1	Investment Specialist
	September 2010	3	1	Investment Specialist
	October 2010	4	2	Investment Specialist Investment Officer
	February 2011	3	1	Senior Investment Specialist
	April 2011	4	2	Senior Investment Specialist Investment Officer
	November 2011	6	3	Director General Director
	October 2012	9	3	Senior Investment Specialist Investment Specialist Investment Officer
	March 2013	4	2	Project Analyst Investment Specialist Investment Officer
	May 2013	6	3	Investment Specialists Associate Investment Officer
Extended Annual Review Report	March 2014	20	5	Investment Specialist Senior Economist Senior Safeguard Officers Associate Investment Officer

INDICATORS AND RATINGS FOR CONTRIBUTIONS TO PRIVATE SECTOR DEVELOPMENT AND ADB STRATEGIC DEVELOPMENT OBJECTIVES

Results Area	Actual Achievements	Rating ^a	Justification	Potential Future Achievements ^b	Risk ^c
1. Within Company Private Sector Development Effects					
1.1 Improved skills. New or strengthened strategic, managerial, operational, technical, or financial skills.	A culture of meritocracy and accountability established. Motivated workforce. Around 950 inducted in management trainee programs.	Excellent	When Abraaj Capital took management control over KEL in September 2008, each department's responsibilities and goals were clearly defined, and an annual performance appraisal process was implemented. Internal job postings help employees find positions better suited to their skills. Management trainee programs that hire and develop talent from reputable companies provide KEL with a boost of youthful energy and fresh perspectives.	All KEL employees at par with KEL values and vision. With qualified and well-placed employees, KEL's performance is further improved. Public perception of KEL is more positive. More people would want to work for KEL.	Medium. There remain some KEL employees who struggle to overcome the public sector mindset.
1.2 Improved business operations. Improved ways to operate the business and compete, as seen in investee operational performance against best industry benchmarks or standards.	Increase in generation capacity from 1,756 MW in 2007 to 2,341 MW in 2013. Increases in average generation fleet efficiency and average plant availability factor noted. Transmission losses down from 5.00% in 2007 to 1.25% in 2013. Distribution losses reduced from 29.00% in 2007 to 25.99% in 2013. Improved system reliability: 52% reduction in	Excellent	Increased generation capacity, fleet efficiency, and average availability factor through the addition of new plants (KTPS and BQTPS), major overhaul of existing units, and effective annual maintenance. The use of elevated pole-mounted transformers, coated aerial bundled cables, and electrostatic meters reduced opportunities for power theft. As of December 2013, 69% of Karachi's areas, has only 16% transmission and distribution losses. All power units and grid stations are monitored by a centralized load dispatch center using a state-of-the-art	Generation capacity to further increase with ongoing generation projects. Transmission and distribution systems to become more reliable with more related capital expenditures planned (e.g., smart grid). Losses to decrease further with continued loss reduction efforts.	Low. Projects to increase and enhance generation, transmission, and distribution are already ongoing.

	<p>transformer tripping and 32% reduction in transmission line trips.</p> <p>28 IBCs established (segregating service areas) and organized as profit centers.</p> <p>Two distribution service providers contracted to manage high loss and low recovery areas.</p> <p>Savings due to the voluntary separation scheme.</p>		<p>supervisory control and data acquisition system.</p> <p>17 out of the 28 IBCs contribute over 80.1% of KEL's revenue with a recovery rate of over 97.1%. The IBC head is accountable for losses, collections, productivity, and profitability of the IBC area.</p> <p>Through distribution service providers, KEL gained access into high security risk areas, bringing down transmission and distribution losses in these areas from 49% in June 2012 to 45% in June 2013.</p> <p>KEL became EBITDA positive in FY2011, and registered net profitability in FY2012 (a first in 17 years). Its ratio of customers to employees improved from 143:1 to 221:1.</p>		
<p>1.3 Improved governance. As evident in set standards related to corporate governance; stakeholder relations; environmental, social, health, and safety fields and/or energy conservation; and their implementation.</p>	<p>KEL launched stakeholder engagement and enrichment drives for sustainability to promote stakeholder engagement; social investment programs; and environmental, social, and governance practices.</p> <p>Customer perceptions of KEL have improved. In December 2011, KEL achieved a score of 3.2 out of 4.5 in Nielsen's Brand Equity Index.</p>	Excellent	<p>KEL management engages in continued dialogue with key stakeholders (e.g., customers, ministries, regulatory bodies, power sector players, and key suppliers). It holds face-to-face sessions between customers (the common people) and KEL leaders. Liability insurance for KEL directors and officers is provided. KEL has an internal control system, an internal audit system, and a whistleblower initiative.</p> <p>As per the Nielsen brand tracker, from October 2009 to December 2011, KEL's perception (i) as a caring organization improved from 2% to 28%, (ii) as a trustworthy organization improved from 3% to 28%, (iii) as being concerned for the well-being of Karachi improved from 5% to 23%, (iv) as an accurate biller improved from 7% to 23%, and (v) as a</p>	<p>KEL continues to seek more stakeholder engagement opportunities and remain compliant with all Global Reporting Initiative indicators. KEL's brand equity will continue to improve, indicating that people's mindset of KEL is becoming more positive.</p>	<p>Low. KEL management recognizes the importance of corporate governance, stakeholder engagement, and transparency for a successful turnaround.</p>

	In November 2012, Global Reporting Initiative gave KEL's first sustainability report an "A" rating, and KEL standards were found to be compliant with Global Reporting Initiative's social, environmental, governance, and economic indicators.		prompt resolver of complaints improved from 6% to 26%.		
1.4 Innovation. New or improved infrastructure design; technology; service delivery; ways to cover or contain cost, manage demand, or optimize utilization; improved risk allocation between private companies and the Government of Pakistan; financial structure; etc.	<p>BQTPS introduced to Pakistan the use of a dry low nitric oxide and nitrogen dioxide combustion system for emission abatement in Frame 9E machines.</p> <p>BQTPS is the largest power station water treatment plant in Pakistan.</p> <p>Reduced power theft through a state-of-the-art billing system, electronic metering devices, coated aerial bundled cables, and pole-mounted transformers.</p> <p>Smart grid plans finalized.</p>	Satisfactory	<p>BQTPS has fewer emissions and a high thermal efficiency, which enables it to generate 3–4 MW per 1 million cubic feet per day. Other less thermally efficient plants only manage to produce 2–3 MW per 1 million cubic feet per day.</p> <p>The use of reverse osmosis minimizes waste matter and any impact on seawater temperature.</p> <p>Loss reduction efforts have yielded a transmission and distribution loss rate of only 16% for 69% of Karachi's areas, as of December 2013. All power units and grid stations are monitored by a centralized load dispatch center using a state-of-the-art supervisory control and data acquisition system.</p> <p>A smart grid enhances network management using digital technology, increasing the reliability of the distribution network and enhancing energy visibility and recoveries. It also enables remote disconnections.</p>	<p>Ongoing and future generation initiatives focus on efficiency enhancement and fuel diversification through coal and coal conversion, biogas, liquid natural gas, wind, and hydropower projects.</p> <p>Aerial bundled cables will be rolled out on pole-mounted transformers in all high-loss areas to further reduce power theft.</p> <p>Continued replacement of electromechanical meters with electrostatic meters to increase metering accuracy and reduce meter tampering.</p> <p>Smart grid pilot project to cover 10,000 customers.</p>	Low. Projects to enhance generation, transmission, and distribution are already underway.

<p>1.5 Catalytic element. Mobilizing or inducing more local or foreign market financing or foreign direct investment in the company.</p>	<p>Additional loans were invested in KEL's turnaround during 2010's reprofiling exercise.</p> <p>In May 2012, KEL successfully raised PRs2 billion through term finance certificates. In February 2014, KEL successfully launched <i>sukuk</i> (Islamic bonds) worth PRs6 billion.</p>	Excellent	<p>Additional loans came from Austria's Oesterreichische Kontrollbank Aktiengesellschaft, and local commercial banks.</p> <p>The term finance certificates were KEL's first attempt to access local capital markets. The term finance certificate issue was fully subscribed in 6 weeks, while the <i>sukuk</i> issue was fully subscribed in 12 business hours. These issuances provide KEL a track record that would allow it further access to more financing for a sustained turnaround.</p>	<p>More financing is expected for KEL's ongoing projects such as for unit conversion; coal conversion; and future generation initiatives such as biogas, liquid natural gas, wind, and hydropower projects. A further <i>sukuk</i> issue is being planned.</p>	<p>Low. The unit conversion project is already financed, and KEL is able to obtain funding for the remaining projects since it already has a track record.</p>
2. Beyond Company Private Sector Development Effects					
<p>2.1 Private sector expansion. Contribution by a pioneering or high-profile project that facilitates or paves the way for more private participation in the sector and economy at large.</p>	<p>In 2010, the private sector accounted for 46% of Pakistan's generation capacity.</p> <p>The government's privatization program for several state-owned companies has recommenced in fiscal year 2014.</p> <p>Borrowings extended to the private sector have increased.</p>	Excellent	<p>Installed capacity by the private sector increased 49% from 8,564 MW in 2008 to 11,681 MW in 2013, with the project contributing to more than 25% of this increase. Currently, there are 29 private generation companies compared to 21 in 2005.</p> <p>Following KEL's success, the government is set to privatize around 30 state-owned entities. In March 2014, the Privatization Commission sought proposals for financial advisory services for the privatization of Faisalabad Electric Supply, Northern Power Generation, and Pakistan International Airlines.</p> <p>From July 2013 to June 2014, loans extended to Pakistan's private sector touched a 6-year high of PRs384 billion.</p>	<p>The privatization of more state-owned entities will bring in private intellectual and financial equity to create widespread improvements in the overall system.</p> <p>From 2014 to 2018, Pakistan's private sector intends to invest over \$14.3 billion to increase Pakistan's total electricity generation capacity by nearly 46%.</p>	<p>Medium. Although the privatization project is large-scale and time-consuming, the government is committed in implementing it to comply with the conditions set by the International Monetary Fund program for Pakistan.</p>
<p>2.2 Competition. Contribution of new competition pressure on public and/or other</p>	<p>KEL's turnaround created higher benchmarks for the power sector to follow</p>	Excellent	<p>During 2013, BQTPS and KTPS registered plant availability and generation efficiency factors that are significantly higher than other</p>	<p>KEL becomes a model for the other state-owned entities that will be privatized, especially</p>	<p>Medium. The government's privatization process has</p>

sector players to raise efficiency and improve access and service levels in the industry.	in areas such as generation efficiency, availability, and operational initiatives to reduce theft and improve customer relations. Privatization of other state-owned entities is now being undertaken.		generation plants in Pakistan. KEL's transmission and distribution loss of 26% is lower than that of other distribution companies such as Peshawar Electric Supply Company (36%), Hyderabad Electric Supply Company (28%), and Sukkur Electric Power Company (39%).	those in the power sector. Pressure among these power sector utilities to emulate KEL will continue to increase. This will be beneficial to improve the efficiency and service level of the power sector.	already started.
2.3 Demonstration effects. Adoption of new skills, improved infrastructure assets and services, more efficient processes, maintenance regimes, improved standards, and risk allocation and mitigation beyond the project company.	KEL's segmented load shedding model is now replicated by Peshawar Electric Supply Company. Other power supply companies in Islamabad, Multan, Hyderabad, and Lahore are expected to follow suit.	Excellent	KEL offers to share its experiences with other energy companies. Its innovative measures to reduce losses are acknowledged as best practices in the power sector. KEL's turnaround story is also discussed as a case study in prominent business schools, including Harvard Business School.	More power sector companies adopt KEL's initiatives.	Medium. Demonstration effects are dependent on what the government directs other power supply companies to do.
2.4 Linkages. Relative to investments, the project contributes notable upstream or downstream linkage effects to business clients, consumers, suppliers, key industries, etc. in support of growth.	Exempting industrial areas from load shedding had a direct positive economic impact. Industrial growth in Karachi is evident with more production and output. The supplier chain was strengthened.	Excellent	Without the project, Karachi and its citizens would not be able to enjoy the socioeconomic benefits that a sustainable electricity supply brings, e.g., medical facilities, educational institutions, infrastructural development, and job opportunities.	With an uninterrupted supply of electricity, improvements in the quality of people's lives will continue as trade and industry flourish in Karachi.	Low. Karachi's industrial areas and several of its vital organizations (schools and hospitals) are already exempt from load shedding, providing positive effects to everyone.
2.5 Catalytic element. Mobilizing or inducing more local or foreign market financing or foreign direct investment in the sector (beyond the company) through pioneering or catalytic	KEL's success has helped the government decide to pursue more privatization to bring in funding as well as introduce efficiencies across the power sector.	Excellent	Addressing the energy sector crisis is one of the highest priorities in Pakistan, and the government is concerned with resolving the issues promptly. KEL is one of the few utilities in the sector that has good credit, inducing local lending and investments.	Several investors, lenders and financial advisors will be willing to participate in the government's privatization cases. More banks and lending institutions to fund more	High. Security in Pakistan is an issue that could hinder investments and lending from foreign markets.

finance.	Power investments have increased. More independent power producers exist.		Since its creation in 1994, the Private Power and Infrastructure Board of Pakistan has attracted power investments of around US\$ 9.4 billion. Currently, there are 29 private generation companies, compared to 21 in 2005.	power projects. More projects will provide more power throughout Pakistan, enhancing domestic businesses.	
2.6. Affected laws, frameworks, and regulations. Contributes to improved laws and sector regulation for public–private partnerships, concessions, joint ventures, and build–operate–transfer projects; and liberalizing markets for improved sector efficiency.	KEL is the only power sector company on the Pakistani Prime Minister's commission (constituted through the Ministry of Water and Power) on finding solutions to the country's power crisis. KEL's suggested measures to the government towards overall power sector reform have been implemented to some extent. The government is set to implement the privatization of other state-owned entities.	Satisfactory	KEL has introduced to the commission issues such as electricity theft, electricity conservation, fuel supply constraints, tariff rationalization, and circular debt. It has requested and initiated review of the National Electric Power Regulatory Authority Act and Electricity Act, raising inconsistencies between these two acts. In 2012, a new national gas allocation policy was approved, bringing the power sector second (from fourth) in gas allocation priority. Electricity theft was also declared as a non-bailable criminal offense in early 2014. Pakistan's Privatization Commission has started to seek proposals for financial advisory services for the privatization of some utilities.	KEL will continue lobbying at all levels (government, ministries, gas supplier Sui Southern Gas Company) to allocate optimum gas supply to itself and to the power sector. Increased gas supply means less furnace oil consumption in KEL's generation mix and a smaller government subsidy.	Medium. There is no certainty on when power sector issues can actually be addressed.
3. Contribution to other ADB Strategic Objectives					
3.1 Sector development (outputs). Contribution to other sector development outputs not captured under point 2, such as capacity or network expansion, etc.	Almost 1,000 MW of capacity was added to the generation system, and investments were made in the transmission and distribution system, including the addition of customer service	Excellent	Additional capacity and expansion has improved KEL's customer relations and its company image.	Expansion of KEL's capacity and network continues with several projects in the pipeline that seek fuel diversification (e.g., biogas, coal, wind, hydropower).	Low. KEL will definitely be pursuing these expansion projects to further improve its financial and operational performance, as well as

	centers. Intellectual equity to the power sector.		Over the last 5 fiscal years (2010 to 2014), KEL has contributed its trained human resources to the sector. Most of former KEL employees are now involved in the transformation of the power sector in other cities of the country.		corporate value.
3.2 Sector development (outcomes). Contribution to other sector development outcomes not captured under point 2, such as increased infrastructure utilization or consumption, improved in-country connectivity, improved energy security, etc.	Under Abraaj Capital management, 10 new grids have been energized, 62 km of new transmission lines have been laid out, and 189 km of existing transmission lines have been rehabilitated KEL embarked on a coal conversion project for fuel diversification and security, and reduced its generation cost.	Satisfactory	KEL's transmission network now stands at 62 grid stations; 128 power transformers; a network of 220, 132, and 66 kV circuits; and 1,249 km of overhead and underground cables. Over a coverage area of 6,500 square km, KEL's 11 kV distribution capacity is 4,973 megavolt amperes through 15,588 pole-mounted transformers and substations. In April 2014, the regulator (National Electric Power Regulatory Authority) approved KEL's license modification for its coal conversion project.	Additions and enhancements to the transmission and distribution network to continue, connecting more people to the grid and providing more access to electricity. KEL will bring down its generation cost, and this will lead to increased electricity consumption through lower end user tariffs.	Low. Transmission and distribution systems are continually being maintained and improved. The coal conversion project will be complete by 2017.
3.3 Inclusion. Improved access to and availability or affordability of infrastructure services for the poor and other disadvantaged groups.	KEL provides uninterrupted power to 23 major hospitals and schools in Karachi. Some have been assigned dedicated feeders and pole-mounted transformers, while others are exempt from load shedding. KEL provides vision care for the poor and sponsors multiple youth football leagues for underprivileged communities. KEL provides relief in	Excellent	Some of the social welfare organizations partnered with KEL include: (i) The Indus Hospital in Landhi, which provides free quality care. KEL bears 50% of the cost of its electricity. (ii) The Mary Adelaide Leprosy Center and three dialysis centers of the Sind Institute of Urology and Transplantation, where KEL shoulders 100% of the electricity bills. (iii) The Citizens' Foundation in Karachi, which builds and manages schools in less privileged areas of Pakistan. Electricity of the foundation, along with 320 school units, is 100% borne by KEL. KEL applied this relief for consumers	Two more dialysis centers of the Sind Institute of Urology and Transplantation will soon be finished. Once connected to KEL's power grid, these will enjoy 100% free electricity. More inclusive projects to be undertaken by KEL to give back to communities. An increase in the number of paying customers leads to less load shedding. Thus,	Low. KEL understands how vital these types of projects are in serving its consumers.

	<p>the form of electricity payment exemptions (up to 6 months) for families affected by fire and bomb blasts.</p> <p>Around 65,000 chronic defaulters converted back into good paying customers.</p>		<p>affected by the Abbas bomb blast of March 2013, and the Baldia town factory fire of September 2012.</p> <p>KEL offers easy payment solutions for low end consumers who were chronic defaulters. Easy payment solutions include installment schemes, rebates, and token payments.</p>	<p>public perception of KEL becomes more positive.</p> <p>Improved quality of life for the poor with more access to electricity. More work in the evening can be done to earn money.</p>	
<p>3.4 Job creation. Creation of additional sustainable jobs or self-employment. Distinguish between jobs created within and beyond the company.</p>	<p>Created job opportunities within the company, as well as beyond (through contractors), with the construction and operation of KTPS and BQTPS.</p> <p>The rollout of 28 IBCs created jobs, especially for call center operations.</p>	Satisfactory	<p>For KTPS, about 270 local and foreign workers were employed during construction. KTPS operations are being handled by 120 local employees. For BQTPS, about 755 local and foreign workers worked at the construction site. There are about 215 local staff members manning BQTPS operations.</p> <p>The number of KEL employees in call center operations increased from 70 in 2008 to over 350 agents.</p>	<p>More jobs will be created once KEL embarks on construction and operation of additional generation plants.</p>	<p>Low. KEL is pursuing energy diversification projects.</p>
<p>3.5 Environmental sustainability. Project's net impact on greenhouse gas emissions and other contributions to environmental improvements.</p>	<p>KEL's generation plants are primarily based on natural gas (which is of low carbon).</p> <p>State-of-the-art water recycling plants have been installed in BQTPS and KTPS.</p> <p>KEL's greenhouse gas values declined from an estimated 730 tons of carbon dioxide/GWh in 2006, to 550 tons of carbon dioxide /GWh in 2013.</p>	Satisfactory	<p>Both BQTPS and KTPS run on gas on combined cycle mode for efficiency. BQTPS generates 3–4 MW per 1 million cubic feet per day. Stack emissions and effluent discharge control, especially for boiler operations, are being monitored.</p> <p>It is ensured that water leaving the wastewater treatment plant is free of pollutants to protect the marine habitat and maintain the natural ecosystem.</p> <p>Decrease in greenhouse gas emissions can be attributed to the use of combined cycle gas-fired technology in both KTPS and BQTPS.</p> <p>The waste-to-energy project will collect</p>	<p>Greenhouse gas emissions continue to decrease with renewable projects that use biogas, wind, and hydropower.</p> <p>The biogas project will also produce about 300 tons of organic fertilizer as byproduct that will be used to enrich nutrient-deficient soil.</p>	<p>Low. KEL is already moving into the final phase of the biogas project. The use of renewable energy sources helps the environment.</p>

	KEL is embarking on one of the world's largest biogas projects in Landhi.		biodegradable waste from cattle farms (instead of dumping these into the ocean) and generate around 30 MW of green power.		
3.6 Regional Integration. Project contributions to regional cooperation and integration by facilitating trade, cross-border mobility, cross-border power supplies, etc.	<p>KEL exempted industrial areas from load shedding, which directly and positively impacts the country's economy.</p> <p>The project sourced materials and labor from within Pakistan and from outside the country.</p>	Satisfactory	<p>KEL is solely responsible for electricity supply to Karachi and adjacent areas, including Dhabeji, Garo, Hub, Uthal, and Vinder. As it adheres to standards set by leading international organizations in the energy and utility sectors, it has served as an example for local utility sector organizations.</p> <p>The engineering, procurement, and construction contract for KTPS was awarded to the Mandalay Group (from Greece) and the one for BQTPS was awarded to Harbin Power Equipment (from China). The installed gas and steam turbines and heat recovery steam generators were sourced from General Electric and Harbin Power Equipment.</p>	KEL will continue providing electricity to its consumers within and outside Karachi, providing more opportunities for trade facilitation and regional cooperation.	Low. Industrial areas remain exempt from load shedding.
4. Overall Rating^d		Excellent			

ADB = Asian Development Bank; BQTPS = Bin Qasim Thermal Power Station; EBITDA = earnings before interest, taxes, depreciation, and amortization; GWh = gigawatt-hour; IBC = integrated business center; KEL = K-Electric; KTPS = Korangi Thermal Power Station; km = kilometer; kV = kilovolt; MW = megawatt; MWh = megawatt-hour.

^a Rating scale: unsatisfactory, less than satisfactory, satisfactory, excellent, and not applicable.

^b Potential for further achievements considering relevant developments in the medium term or external to the project.

^c Risk to the realization of further potential achievements on a scale of high, medium, or low.

^d Overall rating scale: unsatisfactory, less than satisfactory, satisfactory, and excellent.

REVIEW OF PAKISTAN'S POWER SECTOR

1. The power sector in Pakistan is a mixed industry of mainly thermal and hydroelectric power plants. As of June 2013, the total installed generation capacity of Pakistan was 23,663 megawatts (MW), of which thermal plants accounted for 16,000 MW (68%), hydroelectric plants 6,826 MW (29%), and nuclear power plants 787 MW (3%).

2. The sector is dominated by two utility companies: (i) Water and Power Development Authority (WAPDA)/Pakistan Electric Power Company (PEPCO)¹ for all of Pakistan except Karachi, and (ii) the privatized K-Electric (KEL), formerly known as Karachi Electricity Supply Company, for the city of Karachi and its surrounding areas. Alongside these two entities, more than 20 independent power producers have been established since 1994, contributing significantly to the country's power sector. Currently, installed generation capacity under the PEPCO system is 87% of the country's total, while the capacity under the KEL system is 13%.²

3. The installed power generating capacity of Pakistan from 2009 to 2013 is given in Table A3.1 below:

Table A3.1: Pakistan's Installed Generation Capacity by Type and System
(MW)

Type	FY				
	2009	2010	2011	2012	2013
Thermal	13,539	14,597	15,895	16,039	16,000
Hydroelectric	6,555	6,555	6,645	6,730	6,826
Nuclear	462	462	787	787	787
Wind power	0	0	0	0	1
Total	20,556	21,614	23,327	23,557	23,663
System					
PEPCO	18,022	18,947	20,743	20,413	20,569
KEL ^a	2,534	2,667	2,584	3,144	3,094
Total	20,556	21,614	23,327	23,557	23,663

KEL = K-Electric, MW = megawatt, PEPCO = Pakistan Electric Power Company.

^a Includes own generation and purchased power.

Source: Government of India, National Electric Power Regulatory Authority. 2013. *State of Industry Report*. Islamabad.

4. Since the bulk of Pakistan's power generation is based on thermal resources—with mainly imported furnace oil and natural gas as fuel—the cost of electricity generation is very high. More than 33% of Pakistan's energy comes through burning furnace oil. Because this fuel is imported, the country's oil import bill is a huge burden to the economy. Any depreciation of the Pakistan rupee against international currencies impacts negatively on the actual fuel cost. The high cost of furnace oil (approximately PRs72,000 per ton), coupled with inefficient power generation machinery, results in a cost of more than PRs18 per kilowatt-hour.

5. To bring oil import costs to a sustainable level and to cater for the energy needs of all sectors, the Government of Pakistan is pursuing policies of attracting private investment in the

¹ Since October 2007, WAPDA has been divided into WAPDA and PEPCO, which are distinct entities. WAPDA is responsible for water and hydropower development, while PEPCO is responsible for the management of all public limited companies under WAPDA in the areas of thermal power generation, transmission, distribution and billing.

² There has been no significant change in these percentages since 2008, when PEPCO's system accounted for 88% and KEL's system accounted for 12%.

energy sector. The private sector's share in Pakistan's total installed capacity has risen from 42% in 2008 to 49% in 2013.

6. Pakistan has been facing a significant challenge in coping with its surging power demand, resulting into a severe energy crisis. Since FY2007, electricity demand in Pakistan has grown at an annual rate of 4% (excluding latent demand)³ due to a growing population, extensive urbanization, rural electrification, industrialization, and rising per capita income. The electricity shortfall increased from 2,650 MW in FY2007 to 5,250 MW in FY2013, primarily due to fuel supply constraints and low hydroelectric generation.

7. Other factors affecting power supply are the non-utilization of total available capacity due to gas shortages and the government's inability to finance the purchase of furnace oil for generation companies and independent power producers due to circular debt.⁴ Transmission and distribution of electricity is also unreliable due to weak grid infrastructure and significant electricity theft.

8. Pakistan's gross domestic product suffers an annual loss of 2% due to power and gas shortages, which force the industrial sector to work below production levels, threatening Pakistan's export industry. Acute shortages also create law and order problems in the country. The development and use of indigenous resources for Pakistan's energy mix is needed for affordable and sustainable energy.

9. Given the current situation in the power sector, future projections on power supply and demand are not encouraging. According to the National Transmission and Despatch Company, the power deficit will persist beyond 2017 as seen in Table A3.2.

Table A3.2: Projected Surplus or Deficit in Demand and Supply during the National Transmission and Despatch Company's System Peak Hours

FY	Planned Generation Capability (MW)	NTDC Projected Demand Growth Rate (%)	NTDC Demand during Peak Hours (MW)	Surplus / Deficit (MW)
2014	21,668	7.43	25,918	(4,250)
2015	30,510	7.70	28,029	2,481
2016	20,352	5.50	24,018	(3,666)
2017	21,616	4.80	25,521	(3,905)
2018	24,924	4.80	26,755	(1,831)

MW = megawatt, NTDC = National Transmission and Despatch Company.

() = negative.

Source: Government of India, National Electric Power Regulatory Authority. 2013. *State of Industry Report*. Islamabad.

10. The government recognizes the gravity of the power sector situation and has made it a priority to rapidly expand the country's power generation capacity to meet its energy needs in a sustainable manner by attracting and directing local and foreign investments, especially towards

³ Latent demand represents a desire or preference that a consumer is unable to satisfy due to lack of information about the product's availability, or due to lack of money.

⁴ Total circular debt in the country's power sector reached PRs180 billion in February 2014 after the government cleared PRs480 billion in July 2013. This is mainly caused by high fuel cost for thermal power generation, inefficiencies of generation, below-cost tariffs, and nonpayment of electricity dues by public and private consumers. The current level of debt prevents power sector entities from obtaining funding for improvements to their management systems or for systematic operations, and it also renders the sector less attractive for prospective investors who could support sector expansion for improved services.

the development of indigenous energy resources. To make the power sector more attractive and bankable to investors, tariff rationalization will minimize or eliminate subsidies among industrial, commercial, and bulk consumers as much as possible.

11. In July 2013, the government retired PRs480 billion worth of circular debt, resulting in an additional power supply of over 1,700 MW. An aggressive rehabilitation and expansion program for generation companies is underway. Strict laws to curb gas and electricity pilferage shall be implemented. A new petroleum policy has been introduced, which provides a level playing field to domestic and international companies to invest in the oil and gas sector of the country.

12. The government will also focus on building medium- and long-term hydroelectric capacity in the country.⁵ Pakistan is estimated to have a hydro potential of about 60,000 MW, of which only 6,556 MW has been tapped. To achieve its medium- and long-term capacity expansion goals, the government will jump-start low-cost power projects, finish large infrastructure hydroelectric power projects,⁶ and retire high-cost energy contracts. It shall also sponsor public-private partnerships for coal and hydro projects. Key client managers or relationship managers at the Ministry of Water and Power will be assigned to act as a “one-window operation” for investors in the power sector and ensure the timely completion of investments and projects.⁷

⁵ Hydropower currently comprises 29% of Pakistan’s energy mix, compared to nearly 70% in the 1980s, the result of a slowdown in hydropower development due to lingering controversies about major hydropower projects. Consequently, thermal power was relied upon and preferred, as natural gas was abundant and cheaper than oil. However, a shortage of gas has resulted in a greater use of expensive furnace oil and high-speed diesel oil.

⁶ A total of 388 MW of hydroelectric power is expected by February 2015 from six ongoing projects. An additional 969 MW is anticipated from another hydro project by November 2016. Another 247 MW will be added to the grid from smaller hydroelectric projects by December 2017.

⁷ Government of Pakistan, Ministry of Water and Power. 2013. *National Power Policy*. Islamabad.

ENVIRONMENTAL IMPACT

A. Background

1. The project is a corporate loan involving electricity generation capacity expansion of two existing K-Electric (KEL) thermal power stations through the addition of gas-fired combined cycle power generation units of 220 megawatts (MW) at Korangi Thermal Power Station (KTPS) and 560 MW at Bin Qasim Thermal Power Station (BQTPS). Considering that the potential adverse impacts can be readily addressed through mitigation measures articulated in the environmental and social action plan and the environmental management plan, the project was classified as environment category B. Social and environmental impact assessment reports were prepared by KEL for the project in January 2007 and filed on 14 February 2007. “No objection” clearance for the project was issued on 9 July 2007 by the Sindh Environmental Protection Agency. An evaluation of the implementation of the environmental and social action plan, environmental management plan, and the degree of compliance with environmental safeguards requirements was conducted for the project.¹

B. Mission Review Findings

2. **Compliance with government permits and agreements.** KEL is in compliance with the requirements of the following Pakistani laws and rules necessary for business operations: Shop and Factories Act 1934, Industrial Relations Act 2008, and Pakistan Environmental Protection Act 1997. Environmental conditions as stipulated in the “no objection” clearance have been addressed by KEL. Other government licenses that need to be secured and renewed annually for continuous project operations are boiler, explosive, wireless, and excise licenses. There were no fines or penalties incurred due to environmental or social noncompliance, and no material environmental claims were filed against KEL. The company received recognition in the form of several national environmental excellence awards,² and other safety and fire protection awards from 2010 to 2013.

3. **Compliance with environmental and social action plan.** Major actions required under the revised environmental and social action plan (October 2009) have been partially complied with by KEL. However, action 6A (conduct treatment of wastewater at existing thermal power stations) will be an ongoing activity to be addressed by KEL. During the mission, it was confirmed that action 9 (installation and operation of continuous environmental monitoring system) has already been installed for emission control and monitoring requirements.

4. **Health, safety, and environmental issues during construction.** During the construction of BQTPS and KTPS, an owner’s engineer was hired by KEL to supervise, monitor, and document the progress of the construction works. Health, safety, and environmental issues

¹ The extended annual review mission during 17–21 March 2014 comprised S. Kondo, investment specialist; S. Durrani-Jamal, senior economist; A. Porras, senior safeguard officer; M. Principe, senior safeguard officer and R. de Leon, associate investment officer from the Private Sector Operations Department. The mission reviewed the available environment-related documents, visited the project site, and met with project staff members, consultants, and local residents in nearby villages.

² The environmental excellence awards are presented annually to companies that have not only met but surpassed governmental compliance requirements and demonstrated a commitment towards environmental excellence. The award recognizes how KEL management uses innovative approaches to help reduce environmental impacts and build a sustainable business. The award is organized by the National Forum for Environment and Health, Fire Protection Association of Pakistan and is affiliated with United Nations Environmental Programme and is supported jointly by the Ministry of Environment, Government of Pakistan, Federation of Pakistan Chambers and Commerce Industry, and Karachi Chambers and Commerce Industry.

were documented and reported by the owner's engineer. Together with the lender's engineer, the owner's engineer reported that environmental conditions at the KTPS project site were being taken care of in an appropriate and satisfactory manner. To further improve the health and safety situation at the project site, the contractor's health and safety advisors conducted seminars on construction site safety.

5. **Environmental impacts.** Environmental impacts were assessed to be minor, short-term, and temporary in nature during construction, and there were few significant impacts during operation (e.g., air emission, thermal discharge, wastewater quality, and noise). Since the project was developed within the existing thermal power stations, no endangered flora or fauna species have been affected. The transmission lines used the existing towers and rights-of-way to avoid disturbances to the ecosystem and current land uses. Since KEL is an ISO 14001-certified company, all activities that impact the environment are carefully measured and monitored for stack emission, ambient air, noise, effluent discharge, and water quality through a system of internal audits at the departmental level, regular oversight at the corporate level, and reviews performed by independent external verifiers. KEL is in compliance with Pakistan's National Environment Quality Standards and international standards.

a. Air Emissions

6. Both KTPS and BQTPS operate on natural gas, while BQTPS may at times be shifted to furnace oil when the gas supply is short. In those situations, 75% of BQTPS operates on natural gas and 25% on furnace oil. KEL has installed a dry low NO_x combustion system and a water injection system to reduce NO_x emission.³ KEL also installed charcoal filters to combat the residual emission from the stacks. KEL has engaged a third-party environmental laboratory on a yearly contract to carry out monthly monitoring of the critical parameters of ambient air and stack gas emission for both furnace oil and natural gas. Monitoring results showed that all tested parameters (sulfur dioxide, nitrogen oxides, carbon monoxide, and particulate matter) are within Pakistan's National Environment Quality Standards and World Bank standards.

b. Thermal Discharge

7. Both expansion projects use a once-through cooling system that uses seawater and discharges thermal effluent to the marine environment. Thermal effluent from the power plants passes through series of cooling tower, pond, and outfall channels covering a considerable distance to allow the heated water to cool down to its original temperature before it is released back into the natural receiving water. Monitoring at the outfall channels shows that there is no rise in the temperature of thermal effluent, which means the standard limit is met. The cooling intake structure is also designed to have the through-slot velocities of the screen below 0.5 feet per second to prevent entrainment and impingement of marine organisms.

c. Wastewater Effluent Management

8. Wastewater effluent generated from various working areas in the cooling water pit, gas turbine area, and steam turbine area within the plants is treated by passing it through a series of wastewater treatment facilities such as a neutralization basin, an oil separator waste treatment system, and a sanitary wastewater treatment system. These treatment procedures of

³ NO_x is a term for the mono-nitrogen oxides nitric oxide and nitrogen dioxide, which are produced from the reaction of nitrogen and oxygen gases in the air during combustion, especially at high temperatures such as inside a power station boiler.

wastewater (i.e., lamella separator) ensure that no objectionable color, odor, and turbidity are produced. All tested parameters such as biological oxygen demand, chemical oxygen demand, oil and grease are within the limits of Pakistan's National Environment Quality Standards. Similarly, all domestic sewerage water is discharged after primary treatment and chlorination before subsequent use in greenbelt areas.

d. Noise Control

9. Periodic monitoring of all working areas within the plants is carried out to ensure noise levels are within reasonable levels and in compliance with local and international standards. For working areas that exceed the recommended measures for acceptable noise levels, the wearing of ear plugs and/or hearing protective devices is enforced, and monitoring and/or engineering controls are instituted. Regular noise level surveys are carried out for working areas within the plants to measure noise level.

e. Solid Waste Management

10. Various types of waste are generated by KEL in its different business units and divisions. These waste types include both nonhazardous waste (e.g., wood, scrap iron, copper conductors, plastic drums, steel drums, scrap cables, and energy meters) and hazardous waste (e.g., used oil). Dedicated waste transition yards have been established in each business unit and division to ensure effective waste management. The waste transition yard provides for the segregation of waste into required categories prior to suitable disposal. Final disposal of residual waste at government-designated disposal sites is done by an outsourced waste contractor.

f. Asbestos Monitoring

11. A third-party consultant conducted asbestos monitoring in the old Bin Qasim power plant using United States Environmental Protection Agency-designated asbestos monitoring equipment and procedures on 25 May 2011. The fiber level of the asbestos at all monitored locations was within the prescribed limit of international standards of the United States Occupational Safety and Health Administration, indicating the presence of asbestos does not pose as a threat to the inhabitants of the building. No asbestos containing materials or products were used in the construction of KTPS and BQTPS. A comprehensive corporate asbestos management procedure is patterned after the Occupational Safety and Health Administration, Environmental Protection Agency, and health, safety and environment practices in the United Kingdom.

g. Greenhouse Gas Emission Performance

12. KEL conducts regular monitoring of greenhouse gas emissions through a third-party environmental monitoring consultant, which has performed annual quantification and monitoring of greenhouse gas emissions at KTPS since its commissioning in 2009 and at BQTPS since its commissioning in 2012. KEL's greenhouse gas emission values declined from 2006 to 2013.⁴ The reduction of greenhouse gas emissions can be attributed to the following factors: (i) introduction of combined cycle gas-fired technology in both KTPS and BQTPS, (ii) use of clean fuel (natural gas) at both plants, and (iii) decommissioning of some of KEL's old power plants that used furnace oil as fuel. KEL is committed to regularly monitoring its greenhouse gas

⁴ KEL's greenhouse gas emission values declined from an estimated 730 tons of carbon dioxide per gigawatt-hour in 2006 to an actual 550 tons of carbon dioxide per gigawatt-hour in 2013.

emissions, and it continues to pursue initiatives designed to further reduce greenhouse gas emissions.

13. **Environmental Management System.** KEL has designated its corporate-level health, safety, environment, and quality (HSEQ) department as well as plant-level HSEQ units to implement the environmental management plan and ensure health, safety, and environmental compliance during plant operations. KEL has strived to achieve international accreditations and certifications (e.g., OHSAS 18001:2007, EMS ISO 14001:2004, and QMS ISO 9001:2008), which are integrated into plant operations to further increase efficiency, minimize environmental impacts, improve health and safety performance, and ensure compliance with regulatory requirements and international standards. In addition KEL has prepared a corporate HSEQ manual (first edition, July 2010) consisting of system procedures on fire prevention and management; industrial health; and HSEQ management, including an emergency response plan, waste management procedure, health and hygiene management procedure, spill prevention procedure, and disaster management. These environmental management procedures are used in different business units across the company to continuously mitigate and manage health, safety, and environmental impacts. To promote awareness of the highlights of the HSEQ manual, training programs on fire fighting; first aid; safety awareness; health, safety, and environmental compliance; asbestos management; and ISO 14001 lead audit are regularly conducted for KEL staff. KEL has provided a budget allocation for training to benefit corporate and power plant staff. The quarterly environmental monitoring report is prepared by the HSEQ officer and submitted by the plant manager to the general manager before being forwarded to the Sindh Environmental Protection Agency.

14. **Safety Management System.** Records show that there has been a 45% reduction in employee accidents and a 50% reduction in public accidents from 2011 to 2013. To continually reduce accidents, injuries, and fatalities, KEL introduced a safety management system.⁵ Through spot checks, field surveys, and safety audit activities, unsafe actions by staff and unsafe conditions present in the system are identified and mitigated through the implementation of recommended actions to prevent recurrence of such incidents. An emergency response plan and awareness training for employees and members of the community in fatality-prone areas are part of safety management system strategies designed to further prevent accidents and to positively contribute towards KEL's safety culture.

C. Conclusion and Recommendation

15. Based on the review and evaluation of available safeguards documents, the site visit, and interviews with HSEQ department staff members, it is concluded that national and Asian Development Bank safeguards requirements related to the project's environmental and social impacts have been adequately met. KEL's environmental and social performance has been satisfactory. Monitoring and reporting activities of KEL and the third-party environmental monitoring consultant should be maintained throughout the operations of the thermal plants to attain full compliance with Pakistan's National Environmental Quality Standards and international standards.

⁵ The safety management system was formulated and implemented through a multi-pronged approach comprising consolidated existing reactive techniques while introducing proactive risk management techniques of hazard management.

SOCIAL IMPACT

A. Review Findings

1. The 560-megawatt (MW) Bin Qasim Thermal Power Station (BQTPS) was constructed on about 90 hectares of land leased by the Port Qasim Authority to K-Electric (KEL) for 99 years starting in July 1979. There are no communities within a 10-kilometer radius. The fishermen's villages located within a 20-kilometer radius are mostly comprised of Sindhi-speaking natives.

2. The 220 MW Korangi Thermal Power Station (KTPS) was constructed on 22.7 hectares of land. The land is part of the 45.3 hectares of land leased by the Ministry of Defense to KEL for 99 years starting in 1962.¹ Part of the leased land encroaches the Goth Ibrahim Hyderi community, but a concrete fence was built to divide the area being used by the community and the area where the KTPS facilities were established.

3. The BQTPS and KTPS facilities were constructed in nontribal lands, and land acquisition for both plants was completed before the project was approved in 2007. Hence, both projects were categorized as C for involuntary resettlement and C for indigenous peoples.

4. In 2008, KEL developed its sustainability policy, which revolves around promoting economic growth while simultaneously promoting environmental and social gains. This entails (i) building and preserving partnerships with communities, customers, nongovernment organizations, and other stakeholders; (ii) respecting the Universal Declaration of Human Rights and the International Labour Organization's core labor standards; and (iii) providing services to communities through sustainable development programs. KEL has continued to conduct quarterly consultations with the Goth Ibrahim Hyderi community and has implemented community programs with the help of the Fisher Folk Forum, a local nongovernment organization. Interactive community sessions have been conducted for Goth Ibrahim Hyderi women to encourage their active participation in community meetings that discuss concerns on illnesses related to water, hygiene practices, and achieving a healthy lifestyle. Health literature has also been disseminated and female health workers have been engaged to conduct door-to-door health campaigns. KEL has also engaged women to sensitize other women in the community on the dangers of illicit electricity hook connections. In addition, KEL also conducted free eye check-ups, diagnosis, and treatments for the Lath Basti Community in Bin Qasim Town in collaboration with the Layton Rahmatulla Benevolent Trust and the World Wide Fund for Nature. The company extends free electricity and system enhancements to nongovernment organizations, hospitals, and educational institutions under its social investment program. Many of these organizations, including the Indus Hospital, Layton Rahmatulla Benevolent Trust, and The Citizens Foundation schools, serve the underprivileged population in the Bin Qasim area. KEL distributed solar study lamps to students and donated land plots for construction of nonprofit primary and secondary schools in neglected areas of Karachi.

5. The construction of the two plants generated employment during the construction and operations phases. There were 1,530 workers employed during the peak of BQTPS construction: 716 were Pakistani workers and the rest were Chinese hired by the Chinese contractor. During the operations phase, 130 regular staff and 85 outsourced staff are employed.

¹ Based on legal documents reviewed by the mission, when the land was handed over to KEL in the 1960s, there were about 32 persons who owned about 40 structures within the demarcated area for the thermal power plant construction who needed to be relocated. The company provided financial compensation, transportation of demolished materials to a designated new place, and reconstruction of any affected community structures such as schools, libraries, and mosques.

During the construction of KTPS, about 270 workers were employed, and during its operations, the plant employs 108 regular employees and 12 outsourced staff. Recruitment of local workers has been done through local subcontractors. KEL, together with contractors and subcontractors, ensures there is no child labor by requiring applicants to submit their national identification card.

6. During the processing of the loan, company-wide labor restructuring was not foreseen by KEL. The change in KEL management in 2008 triggered changes to ensure KEL's achievement of its turnaround strategy. In 2010, KEL conducted consultation meetings with labor unions on the rationale of the planned labor restructuring, and put together a compensation package to be offered. The labor unions resisted, filed lawsuits, and undertook violent protest actions against the company. On 31 December 2010, KEL offered a voluntary separation scheme to its 4,300 employees occupying noncore jobs. The final version of the voluntary separation scheme was relaunched in July 2011 to allow more time for workers to decide. By February 2012, more than 3,000 noncore employees had accepted and availed themselves of the voluntary separation scheme. KEL retrenched the remaining 1,180 noncore employees, offering them the equivalent of 1 month's salary plus all the benefits that were available under the voluntary separation scheme. Of these retrenched workers, 50% accepted the package while the other 50% filed cases in court. Meanwhile, KEL has outsourced its security, bill distribution, and other noncore services. For its remaining core staff, initiatives have been undertaken to further train and develop their capacity.

B. Conclusions and Recommendations

7. BQTPS and KTPS have had positive social development impacts. Both plants have provided employment opportunities to the local community, and KEL has implemented social programs benefiting the community in general. KEL collaborates and partners with nongovernment organizations and civil society groups to engage with local communities and implement community programs.

8. KEL's preparation of the retrenchment plan and the voluntary separation scheme was in line with good practices, and KEL's dialogue with workers and labor unions addressed concerns related to the labor restructuring.

9. KEL reports that it is not aware of any labor issues or complaints from construction workers, but the company needs to keep and maintain records for the monitoring of labor conditions and standards. A contractor and supplier management procedure has been developed to be implemented and monitored by the health, safety, environment, and quality department. The procedure is meant to ensure continuing improvement in performance and compliance of all contractor activities, including monitoring of workforce statistics. ADB requested that KEL continue strengthening record keeping and documentation of its operations, including those of contractors and subcontractors. In line with KEL's sustainability policy and ADB's social protection strategy, KEL has also been requested to monitor its compliance with national labor laws and the International Labour Organization's core labor standards.