Extended Annual Review Report

Project Number: 43903-014
Loan Number: 2722
December 2020

Uch-II Power (Private) Limited
Uch-II Power Project
(Pakistan)

This is an abbreviated version of the document, which excludes information that is subject to exceptions to disclosure set forth in ADB's Access to Information Policy.

Asian Development Bank

CURRENCY EQUIVALENTS

Currency unit – Pakistan rupee (PRe/PRs)

		At Appraisal (30 September 2010)	At Project Review (30 June 2020)
PRe1.00	–	$0.011591	$0.005967
$1.00	–	PRs86.275	PRs167.60
€1.00	–	$1.363	$1.1242
PRe1.00	–	€0.008504	€0.005303
€1.00	–	PRs117.593	PRs188.416

ABBREVIATIONS

ADB	–	Asian Development Bank
BEPA	–	Balochistan Environmental Protection Agency
COVID-19	–	coronavirus disease
CSR	–	corporate social responsibility
DMF	–	design and monitoring framework
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
EPC	–	engineering, procurement, and construction
HSE	–	health, safety, and environmental
IPP	–	independent power producer
NEPRA	–	National Electric Power Regulatory Authority
NTDC	–	National Transmission & Despatch Company
O&M	–	operation and maintenance
OGDC	–	Oil and Gas Development Company
PPA	–	power purchase agreement
RRP	–	report and recommendation of the President
Uch Power	–	Uch Power (Private) Limited

GLOSSARY

low-BTU gas	–	gas with a low calorific value and less heat content

WEIGHTS AND MEASURES

BTU	–	British thermal unit
GW	–	gigawatt, 1 billion watts
GWh	–	gigawatt-hour
MW	–	megawatt, 1 million watts

NOTES

(i) The fiscal year (FY) of Uch-II Power (Private) Limited ends on 31 December. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2010 ends on 31 December 2010.
(ii) In this report, "$" refers to United States dollars.

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BASIC DATA
Uch-II Power Project
(Loan Number 2722 – Pakistan)

Key Project Data	As per ADB Project Documents ($ million)	Actual ($ million)
Total Project Cost	493.1	478.9
Equity Commitment	123.3	121.5
Asian Development Bank Investment:		
Committed	150.0	150.0
Utilization		91.1
Partial Risk Guarantee		
Committed	50.0	50.0
Utilization		0.0
Loan from Ordinary Capital Resources		
Committed	100.0	100.0
Disbursed		91.1
Loan from Islamic Development Bank:		
Committed	90.0	90.0
Disbursed		84.0
Loan from International Finance Corporation:		
Committed	100.0	100.0
Disbursed		91.1
Loan from the Export-Import Bank of Korea:		
Committed	100.0	100.0
Disbursed		91.1
Debt–Equity Ratio at Completion	75:25	75:25

Key Dates	Expected	Actual
Concept Clearance Approval	29 Jan 2009	29 Jan 2009
Board Approval	13 Dec 2010	13 Dec 2010
Execution of Agreements including Risk-Sharing	31 Mar 2011	20 Jan 2011
First Disbursement		31 May 2011

Project Administration and Monitoring	Number of Missions	Number of Person-Days
Due Diligence and Appraisal	…	…
Project Administration	4	5
Extended Annual Review Mission	0	0

EXECUTIVE SUMMARY

On 13 December 2010, the Asian Development Bank (ADB) approved a $150 million investment in the Uch-II Power Project consisting of a $100 million loan from its ordinary capital resources and a $50 million partial risk guarantee for a $50 million loan provided by international commercial banks to support a $493 million combined cycle gas-fired power plant project in Balochistan Province of Pakistan.

ADB's support in this project was intended to encourage private sector participation and to alleviate a severe power shortage—estimated in 2010 at more than 4,200 megawatt (MW) peak deficit—that was adversely impacting the country's economic growth and poverty reduction efforts. Pakistan urgently needed to develop indigenous energy resources to reduce its dependence on imported fuel oil that accounted for a third of its power supply. The project was also expected to stimulate the economy by purchasing local goods and services and creating jobs for qualified locals in the project area and in the country.

The successful financing of this project provided additional generation capacity and increased the reliability of electricity supplies in the country. The project contributed 380.75 MW to Pakistan's electricity generation capacity. Uch-II Power (Uch-II or the company) delivers 2,500–2,800 gigawatt-hours per year to the national grid meeting the demand of National Transmission & Despatch Company (NTDC). Uch Power and Uch-II utilizes low British thermal unit (BTU) natural gas from a gas field that had remained untapped for almost 40 years prior to the investment and that had no alternative commercial use. Electricity supplied by the project is more affordable than that of plants running on imported fuel and is not affected by volatility of the international fuel market.

The project is consistent with ADB's long-term strategic framework (Strategy 2020), which emphasizes investing in infrastructure to achieve rapid and sustainable economic progress, connecting the poor to markets, and increasing their access to basic productive assets as part of ADB's support for achieving inclusive growth. The project is also in line with ADB's 2009–2013 country partnership strategy in Pakistan, which highlights the importance of energy sector development, private sector participation in infrastructure development, and expansion of ADB's private sector operations in the energy sector.

This review rates the overall performance of ADB's investment in the project as *successful*.

The project's overall development impact and its contribution to private sector development is rated *satisfactory*. The project contributed to the country's energy security by adding generation capacity while promoting use of a low-cost fuel to make electricity affordable. It has also contributed significantly to private sector development by improving people's quality of life, creating new employment opportunities, and supporting socioeconomic advancement in a remote and economically deprived area of Pakistan.

The environmental, social, health, and safety performance is rated *satisfactory*. Environmental impacts were minor, short-term, and temporary during construction, and there were few significant impacts such as air emission, water resource extraction, effluent discharge, noise, or solid waste generation during operation. The company has demonstrated its commitment to attain the highest level of health, safety, and environmental management. All incidents were investigated and corrective actions were implemented. Corrective actions and frequent safety inspections, audits, and training helped to reduce the recurrence of incidents during operation. No individuals or households were displaced in developing the project. The project site neither belongs to any tribal group, nor is it claimed as ancestral domain area. There are no outstanding issues in relation to the land where the project is located.

The project's contribution to business success is rated *satisfactory*. With its stable revenues, strong profitability margins, and cash flow sufficient to service the financial debt and cover operating expenses, Uch-II has demonstrated satisfactory operational and financial performance throughout 2019 and the first half of 2020. Despite a receivables collection issue that is systemic for the country's power sector, the company has maintained adequate liquidity.

ADB additionality is rated *satisfactory*. ADB provided long-term financing not otherwise available in the financial and country environment at the time. Its active participation in the project provided a degree of comfort to the sponsor and reduced the risk perceived by other financiers. In addition, ADB helped the company to adopt the best environmental and social practices.

ADB investment profitability is rated *satisfactory*. The interest margin received by ADB was approved by the Investment Committee and deemed appropriate for this kind of risk. Uch-II has been making principal and interest payments on schedule. It is important to note, however, that the project's further performance and ADB investment profitability also depend on the outcome of power sector reforms that the Government of Pakistan plans for the near or medium future.

ADB's overall work quality is rated *satisfactory.* Its transaction team identified a reliable sponsor in a challenging environment in Pakistan at the time of the investment. The project was appropriately structured with an adequate security package. The deal team cooperated successfully with other lenders in crafting the financing terms. ADB's portfolio team closely monitors Uch-II's operating and financial performance through frequent communication and regular follow-up on timely submission of the reports and financial statements. The team completes the monitoring reports in a timely manner. In addition, ADB's team provided guidance to Uch-II on implementing the environmental and social plan.

ADB learned several key lessons from the Uch-II project. Use of indigenous low-cost resources to produce electricity is one of the key success factors for long-term sustainability of the project. The company provides affordable electricity in Pakistan and ranks high in the offtaker's merit order list based on its economical tariff. Careful risk assessment of potential force majeure events in consideration of the region's climate conditions should be conducted during project appraisal. Also, the availability of transmission lines should be provided in a timely manner to unlock the full potential of power dispersal from the project. Finally, thorough assessment of political and regulatory risk is required.

Despite some delays in its project implementation, Uch-II has been one of the most successful projects in Pakistan. This reflects in particular the strong commitment and support from the project's sponsors and investors. The successful collaboration with other multilateral development institutions also helped to create a robust financing structure for the project's development and realization.

I. THE PROJECT

A. Project Background

1. On 13 December 2010, the Board of Directors of the Asian Development Bank (ADB) approved the investment of $150 million for financing the Uch-II combined cycle gas-fired power plant. This consisted of (i) a $100 million 14-year loan, and (ii) a $50 million partial risk guarantee covering 100% of a 14-year loan from international commercial banks.[1] The project had been preceded by (i) ADB's financing of Pakistan's first private hydropower project (the Bong Escape Hydropower Project), (ii) ADB's equity and a partial credit guarantee for a gas-fired combined cycle power project (the Daharki Power Project using indigenous gas), (iii) ADB's support to privatize the Karachi Electric Supply Company and finance its expansion; and (iv) ADB's financing of the first private wind power project in Pakistan (the Zorlu Enerji Power Project).[2]

2. Pakistan's power industry faced a 4,203-megawatt (MW) supply deficit (equal to 22.2% of the country's peak electricity demand) as of mid-2010 that constrained the country's already fragile economic growth.[3] As stated in the report and recommendation of the President (RRP, footnote 1), although electricity sales and demand rose by more than 40% during 2005–2010, investment in new generation capacity had lagged behind. Pakistan urgently needed to develop indigenous energy resources to reduce its dependence on imported fuel oil that accounted for a third of its power supply. Rising oil prices caused the country's current account deficit to increase and eroded the sector's affordability. In addition, circular debt in Pakistan's power industry impeded progress in expanding power generation. This situation had started with accumulation of payables due from the Government of Pakistan to distribution companies, which were passed on to the generators and then to fuel suppliers.

3. Through collaboration between ADB's Private Sector Operations Department, Central and West Asia Department, and the Pakistan Power and Infrastructure Board, the project was identified as one of three independent power producer (IPP) projects that the board bid out in March 2007. In August 2008, the power and infrastructure board gave approval for Uch-II Power to develop the project further. ADB and the World Bank also supported reform and restructuring of the energy sector to improve its poor financial health, as described in Appendix 3.

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[1] ADB. 2010. *Report and Recommendation of the President (RRP) to the Board of Directors on a Proposed Loan and Partial Risk Guarantee Investment to Uch Power (Private) Limited in the Uch-II Power Project in Pakistan.* Manila.

[2] ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Laraib Energy Limited for the New Bong Escape Hydropower Project in Pakistan.* Manila; ADB. 2007. *Report and Recommendation of the President to the Board of Directors on a Proposed Equity Investment and Guarantee for Daharki Power Project in Pakistan.* Manila; ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed Loan for KESC Post-Privatization Rehabilitation, Upgrade and Expansion in Pakistan*. Manila; ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loan for Zorlu Enerji Power Project in Pakistan.* Manila.

[3] Private Power and Infrastructure Board. http://www.ppib.gov.pk/SupplyDemand.html. As compared with its 18,926 MW peak demand in mid-2010, the country had only 14,723 MW in firm supplies. The resulting shortfall was thus 4,203 MW. As of June 2010, the country's installed power generation capacity was 20,375 MW, of which about 55% was owned and operated by government entities and 45% by independent power producers and/or majority private operators.

B. Key Project Features

4. The project involved design, engineering, construction, and operation of a 404-megawatt (MW) gross-capacity combined cycle gas-fired power plant, located near Dera Murad Jamali, Nasirabad District, Balochistan Province, about 600 kilometers north of Karachi and 42 kilometers northwest of Jacobabad. It is located on the premises of the Uch-I power station, which is surrounded by a boundary wall and covers 260 hectare area. The Uch-I plant occupies only 30% of the land. Like the Uch-I project, the Uch-II plant uses low British thermal unit (BTU) gas from the Uch gas reservoir as the primary fuel.

5. The project is owned by Engie S.A. France (Engie), the largest independent power producer in the world, operating in more than 70 countries on 5 continents and with more than 160,000 employees worldwide.[4]

6. The project financing was at a debt–equity ratio of 75:25. International Power provided $123.3 million of equity and a group of lenders including multilateral development banks provided $369.8 million of debt. ADB provided a $100 million loan with a 14-year tenor, including a grace period of 3 years. In addition, the partial risk guarantee was provided to cover up to $50 million of loans from commercial banks to Uch-II Power in case some multilateral development institutions as prospective lenders would cut back their financing so that the project would be short of funding.[5] In the end, the debt financing was successfully approved from the prospective lenders in the full amount. Hence, the risk guarantee was no longer needed and was cancelled. The cofinanciers include International Finance Corporation ($100 million), Islamic Development Bank ($90 million), and the Export–Import Bank of Korea ($100 million).

7. The project consists of two gas turbine generators, two heat recovery steam generators, one steam turbine generator, one condenser, a multicell cooling tower, and balance-of-plant equipment. The project uses low-BTU gas and a high-speed diesel dual-fuel combustion system. Low-BTU gas is the primary fuel, but distillate liquid fuel is used for start-up and shutdown. Electricity generated is stepped up to 220 kilovolts for connection to the 220-kilovolt switchyard. This switchyard supplies power directly to National Transmission & Despatch Company (NTDC) at its outlet gantries. NTDC is responsible for interconnection of the project to the national grid.

8. Engineering, procurement, and construction (EPC) works were performed by a consortium of Hyundai Engineering Company and Descon Engineering and were expected to be completed in 30 months. Operation and maintenance were managed by experienced staff from Uch Power (Private) Limited (Uch Power), with support from International Power, and key maintenance work was outsourced by a long-term service agreement. Since completion, the

[4] Engie S.A. France is 24% owned by the French government. In 2011, GDF Suez (renamed to Engie in 2015) acquired a 70% of stake in International Power. In 2012, GDF Suez acquired the remaining 30% and took full control of International Power. The acquisition combined two large energy businesses and boosted GDF Suez's presence in South America, the Middle East, Southeast Asia, and Australia.

[5] The partial risk guarantee had been requested only as a backup and was not utilized because the client did not need financing from commercial banks. To mitigate the risk that some multilateral development banks might cut back their loan allocations, the client had requested ADB to consider the risk guarantee.

project has been operating under a power purchase agreement (PPA) with NTDC and a gas supply agreement with Oil and Gas Development Company (OGDC).[6]

C. Progress Highlights

9. Construction activities on the power plant commenced in July 2011. The project's commercial operation date was 4 April 2014. Commercial operation was delayed from the required commercial operation date (8 January 2014) due to several reasons.

10. The fuel supplier OGDC entered into the gas supply agreement on 20 January 2011. That agreement became effective on 30 April 2011 and obligated the supplier to complete the seller facilities. In May 2011, OGDC declared a force majeure event (FME) due to a restraining order in writ petition filed against OGDC in the Islamabad High Court that restricted OGDC from carrying out activities related to the seller facilities development. The order of the court was subsequently modified, and OGDC notified cessation of the FME in August 2011.

11. The EPC contractor declared FME in September 2012 due to heavy rains at the site and floods in nearby areas. The equipment and materials supply remained suspended as a result of the damaged and flooded road infrastructure. The FME ceased in November 2012 after the delivery of generators and a step-up transformer, the repair works on the breached sections of the Jacobabad bypass road, and placement of a frame structure over a damaged bridge near the site. EPC faced shortfall in all three project phases (i.e., construction, procurement, and engineering). The takeover date was rescheduled for 27 December 2013. In August 2013, the EPC contractor declared a second FME due to flooding of the site as a result of intensive rainfall and breach of the evaporation pond. The key critical activities were delayed for 4 months. In April 2014, Uch-II declared the commercial operation date after successful completion of the reliability run test. In September 2017, Uch-II achieved its project completion date.

12. The offtaker was obligated to construct transmission lines prior to the operation date, but these were not in fact completed and energized until May 2018.[7] Due to the grid constraints, therefore, the offtaker was not able to fully disperse power from Uch-II until May 2018.

13. The offtaker's ability to pay for power remains the key risk, and this points to a systemic problem for the power sector in Pakistan. Pakistan's power sector has gone through a substantial reform process. A single buyer model has been in operation since the sector restructuring in June 2015. Despite the reforms, Pakistan has continued to suffer from inadequate capacity and other constraints. At the heart of the impasse is the so-called "circular debt" crisis, whereby distribution utilities, struggling to collect revenues and meet regulatory targets for transmission and distribution losses, delay their payments to generators. At high cost to the exchequer, the sector is periodically bailed out by the government once losses accumulate to intolerable levels.[8] The overdue amount results from (i) the difference between the actual cost and the tariff determined by the National Electric Power Regulatory Authority, (ii)

[6] Uch-II has a 25-year take-or-pay PPA (for 50% of the declared available capacity) with NTDC (the offtaker). The power plant sources gas from the Uch gas fields under a 25-year take-or-pay gas supply agreement (for 50% of the monthly gas requirement) with OGDC.

[7] Under the PPA, NTDC completes, operates, and maintains the interconnection facilities and transmission lines.

[8] R. Bacon. 2019. Learning from Power Sector Reform. The Case of Pakistan. *Policy Research Working Paper*. 8842. Washington, DC: World Bank Group. Energy and Extractive Global Practice.

the government's delayed or nonpayment of subsidies, and (iii) delayed determination and notification of tariffs.[9]

14. The circular debt issue has not been resolved as of today, and this leads to further delays in receivables collection by IPPs, including Uch-II. In 2019 and the first half of 2020, the company's receivable days increased further as minimal payments were received from the offtaker.

15. In the first half of 2020, coronavirus disease (COVID-19) impacted Pakistan's already weak economic situation. Owing to the economic impact and financial strain of COVID-19, Moody's in March 2020 revised down the country's growth forecast to 2%–2.5% from the previous 2.9%. In August 2020, Moody's confirmed Pakistan's credit rating at B3 with stable outlook after it had initiated a review for downgrade in May 2020. The rating agency expects Pakistan's economic growth to be positive but low (at around 1%–2%) for the ongoing fiscal year of Pakistan ending June 2021, after experiencing a recession in the previous fiscal year 2019–2020. Due to the economic slowdown exacerbated by COVID-19, NTDC's ability to pay may further deteriorate, thereby affecting the receivables position of Uch-II.

16. The Government of Pakistan has announced a plan to implement power sector reforms to address the flow in circular debt, improve the transmission and distribution system, and ensure competitive tariffs in the industry. It intends to revisit PPA terms and reduce power generation costs by $950 million annually. The government has determined the power sector's annual capacity payments stand at $4.1 billion and will double in 5 years if no action is taken. Hence, it has determined that the only way to address this would be to reopen PPA terms to reduce generation costs while also undertaking sector reforms. The actual impact upon Uch-II is yet to be understood, as discussions between IPPs and government are ongoing. The outcome will also depend upon the response of IPPs, including Uch-II, to the government's actions.

II. EVALUATION

A. Project Rationale and Objectives

17. The project is consistent with ADB's long-term strategic framework (Strategy 2020), which emphasizes investment in infrastructure to achieve high sustainable economic progress, connect the poor to markets, and increase their access to basic productive assets as part of ADB's support for achieving inclusive growth.[10] Strategy 2020 puts particular emphasis on expanding energy supplies and promoting energy efficiency. The project is in line with ADB's country partnership strategy in Pakistan 2009–2013, which emphasizes the importance of energy sector development, private sector participation in infrastructure development, and expansion of ADB's private sector operations in the energy sector.[11] Energy infrastructure has indeed featured prominently in ADB's private sector operations in Pakistan. The project is also in line with ADB's Energy Policy and is particularly consistent with one of the three pillars of that policy: maximizing access to energy for all.[12] Access to modern and reliable energy services

[9] National Power Tariff and Subsidy Policy Guidelines 2014. Circular debt was officially defined by the Economic Coordination Committee of the Cabinet in 2014: "The circular debt is the amount of cash shortfall within the Central Power Purchasing Agency (CPPA) which it cannot pay to power supply companies."

[10] ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.

[11] ADB. 2009. *Country Partnership Strategy: Pakistan, 2009–2013*. Manila

[12] ADB. 2009. *Energy Policy.* Manila.

fosters sustainable human development, economic growth, higher quality of life, and improved delivery of social services.

B. Development Results

1. Contributions to Private Sector Development and ADB's Strategic Development Objectives

18. The project's overall contribution to private sector development and ADB's strategic development objectives is rated *satisfactory.* Uch-II has met the performance targets set in ADB's design and monitoring framework (DMF). The actual results are compared below with the DMF targets. In addition, the results and ratings for the project contributions are in Appendix 2.

19. The successful financing of this project added generation capacity and increased the reliability of electricity supplies in the country when it faced a severe power shortage. Pakistan's electricity generation capacity increased by 380.75 MW, thereby achieving the DMF target of 375.2 MW by 2014 set at the stage of project approval by ADB.[13] In 2018, Uch-II generated 2,896 GWh, meeting the RRP target of 2,838 GWh. In 2019, the company delivered 2,538 GWh of energy to the grid in accordance with the offtaker's demand.

20. The project promoted the use of a low-cost indigenous fuel to generate electricity, thus contributing to the country's energy security. Electricity supplied by the project is more affordable than is that of plants that use imported fuel, and it is not affected by volatility of the international fuel market. Uch Power and Uch-II utilizes indigenous low-BTU natural gas from a gas field that had remained untapped for almost 40 years prior to the investment and that had no alternative commercial use.[14] Because of its economical tariff (energy purchase price), Uch-II ranks high in the offtaker's merit order list, and this bolsters the government's efforts to maintain the electricity tariff within affordable limits.[15]

21. The project supported socioeconomic advancement in a remote and economically deprived area of Balochistan. As many as 1,499 skilled and 500 unskilled local workers were hired during the construction. The number of jobs created outperformed the DMF's performance target to locally employ 600–800 people.

22. The project also benefited the local economy by purchasing local goods and services. By the end of May 2013, more than $50 million had been spent for locally purchased goods and services. That again achieved the performance target set in the DMF. In addition, Uch-II has undertaken numerous corporate social responsibility activities, particularly with respect to health and education services for the local community. (For further details, refer to Appendix 2.)

23. Finally, the project is more environmentally friendly than are power plants using other fossil fuels. Use of locally sourced, low-BTU gas generates lower CO_2 emissions compared to a coal power plant producing the same output. Natural gas is considered clean energy and an

[13] Net capacity of the plant was established at 380.75 MW on the commercial operations date.

[14] If Uch did not continuously utilize this gas, this might result in reduction of the available gas volume or adversely affect the life of the gas field.

[15] The Uch-II project is high on NTDC's Merit Dispatch list, ranking 12th in the latest list released in July 2020 (based on its having the 12th lowest energy purchase price among the other 130 IPPs' projects). As of 22 July 2020, this price from Uch-II was PRs7.22R per kilowatt-hour while other IPPs ranking from 13th to 130th in the list had purchase prices in the range of PRs7.77–34.32 per kilowatt-hour.

alternative to other low-cost IPPs, such as coal-fired power plants. (For further details, refer to Appendix 2).

2. Environment, Social, Health, and Safety Performance

a. Environment

24. The project was classified as environmental category A, requiring an environmental impact assessment (EIA) in accordance with ADB's Safeguard Policy Statement (2009). The project's environmental and social impacts were assessed in the EIA report disclosed on ADB's website on 7 July 2010 and following the 120-day disclosure policy for a Category A project. The EIA was revised in response to ADB review comments and reposted on ADB's website in December 2010. Uch-II secured a "no objection certificate" prior to construction in July 2011 and an extension of the environmental permit as a requirement prior to operation in April 2014 from the Balochistan Environmental Protection Agency (BEPA). Uch-II also secured an agreement with the Government of Balochistan for extracting water from the existing Pat Feeder Canal to meet the power plant's cooling water needs. NTDC (which is responsible for transmission line construction) and OGDC completed their EIA reports and obtained no objection certificates from BEPA in April 2013.

25. The project's EIA assessed the likely primary and secondary environmental impacts and risks during construction and operation. Cumulative impacts of the simultaneous operations of Uch-I and Uch-II also have been considered. The EPC contractor was responsible for mitigating construction impacts, such as dust, noise from works and equipment, traffic, and solid and liquid wastes generated from the labor's camp. An environmental management plan was fully implemented to mitigate and control the assessed environmental impacts arising from air emission, water use, plant noise, wastewater, solid waste management, as well as hazardous materials and waste handling. It also addressed occupational and community health and safety aspects during operation.

26. An environmental monitoring program was implemented to track the health, safety, and environment (HSE) performance of the project against emission and effluent standards. All the environmental monitoring results have demonstrated an overall compliance with applicable national and international environmental quality standards and regulations. Routine fire drills, monthly inspections of firefighting equipment, regular housekeeping activities, and fresh eyes observations were carried out. A well-equipped project site medical center with medical officer and two nurses were available 24/7 for medical treatment and emergencies. The company's HSE staff was deemed to have sufficient capacity and knowledge to manage environmental and social issues. The company has demonstrated its commitment to attaining the highest level of HSE management. All incidents have been investigated and corrective actions implemented. Corrective actions and frequent safety inspections, audits, and training have helped to reduce recurrence of incidents during operation. The company has strictly complied with the requirement to submit comprehensive quarterly and annual monitoring reports to ADB for review and evaluation. Appendix 6 provides a detailed discussion on environmental impacts.

b. Social Safeguards

27. The project was categorized as C for both involuntary resettlement and indigenous peoples. The land where the project is located is under lease to Uch-II Power (Private) Limited (Uch-II, the borrower) by Uch Power (Private) Limited (Uch Power). The transmission line was

constructed by NTDC, with completion in 2018. No individuals or households were displaced in the development of the project, as prior to project construction the area already had been acquired and developed by UPL. The project site neither belongs to any tribal group nor is it claimed as ancestral domain area. There are no outstanding issues in relation to land where the project is located.

28. During the project's construction about 133 (7%) of 1,999 workers engaged by Uch-II were local residents. Twelve of these local workers from the nearby villages have been retained during project operation. There have been no reported instances of noncompliance with national labor laws by the company, the contractor, or its subcontractors during construction and operation. Uch-II, together with UPL, has been implementing corporate social responsibility activities that are significantly helping the communities. Appendix 7 discusses social impacts in detail.

29. The project's environmental, social, health, and safety performance is rated *satisfactory*.

3. Business Success

30. Overall, the project has demonstrated satisfactory operating and financial performance. In 2019, Uch-II generated revenues of PRs29.7 billion ($192 million), higher by 18% in local currency from the prior year, mainly as a result of foreign currency indexation applicable on Uch-II invoicing and rupee depreciation. The company's actual revenues are in line with the RRP projections.[16] In the first half of 2020, the revenue grew by 3% in local currency terms versus the same period of 2019 and totaled PRs15.6 billion ($93 million).

31. Uch-II remains profitable, with a strong EBITDA (earnings before interest, taxes, depreciation, and amortization) that reached PRs12.2 billion ($79 million) in 2019 and PRs6.5 billion ($39 million) in the first half of 2020. The company's profitability outperformed the RRP projections (projected EBITDA was $69 million for 2019).

32. Receivables collection remains the key problematic issue and is systemic for the power sector in Pakistan (described in more detail in Progress Highlights). Notwithstanding the collection issue, the company generates sufficient cash flow to service its financial debt. This is evidenced by its debt service coverage ratio of 1.47× as of 31 December 2019 and 1.18× as of 30 June 2020. The company was also able to pay out cash dividends of $15.9 million to the shareholders in 2019.

33. The business success of the project is rated *satisfactory*, given that business goals stated at project approval are achieved. Nevertheless, overall prospects for sustainability and growth of the Uch-II project will also depend significantly on the government's decision with regard to power sector reforms and resolution of the longstanding issues concerning the circular debt.

34. The overall development impact rating is *satisfactory*. The project contributed to the country's energy security by adding generation capacity and demonstrating the importance of utilizing low-cost indigenous fuel to generate affordable electricity. It has also contributed

[16] As per the RRP financial model's "Uch-II Base Case," the revenues for 2019 were projected at PRs21.8 million. Actual revenues were higher by 36% in local currency and lower by 5% in USD versus the RRP projections due to the foreign currency indexation (exchange rate and inflation).

significantly to private sector development and ADB's strategic objectives by improving people's quality of life, supporting socioeconomic advancement in a remote and economically deprived area of Pakistan, and setting high environmental and social standards.

C. ADB Additionality

35. ADB additionality is rated *satisfactory*. ADB provided long-term financing not otherwise easily available in the financial and country environment. ADB's active participation and presence in the project provided a degree of comfort to the sponsor given ADB's strong track record and ongoing public and private sector operations in Pakistan's power industry. ADB involvement was also essential to reduce risk perceptions of other financiers that helped successfully complete financing for the Uch-II project. Multilateral development institutions, such as International Finance Corporation, Islamic Development Bank, and Export–Import Bank of Korea, financed the project jointly with ADB. Also, the company received a working capital facility from a local bank. In addition, ADB helped the company to adopt best practices for sustainable management of natural resources and protection of the environment. Uch-II fully implemented the environmental management plan recommended by ADB. The project has positive environmental and safety outcomes that include (i) mitigation of environmental impacts arising from air emission, water use, plant noise, wastewater, solid waste management, hazardous materials and waste handling, as well as occupational and community health and safety aspects; and (ii) contribution to carbon dioxide reduction. Finally, the assistance provided to the project aligns with the government's development plan and ADB's operational strategies.

D. ADB Investment Profitability

36. ADB investment profitability is rated *satisfactory*. Under the loan agreement, the interest margin ADB received was approved by the Investment Committee and deemed appropriate for this kind of risk. Uch-II has been current on all interest and principal payments.

E. ADB Work Quality

37. **Screening, appraisal, and structuring** is rated *excellent*. ADB evaluated the fundamentals of the project and its development impact. The transaction team identified a reliable sponsor within what was a challenging environment in Pakistan at the time of the investment. The sponsor has a good reputation for developing energy projects in Asia. The project was appropriately structured with an adequate security package (debt service reserve account letters of credit from the sponsor).[17] The team identified key project risks, including the offtaker risk, as well as regulatory, political, and sovereign risks. To test the project's financial viability, six sensitivity scenarios representing a variety of adverse conditions were appropriately tested in the model.[18] Under the tested downside scenarios, the minimum debt service cover ratio ranged between 1.24 and 1.32. That is in line with the company's actual such ratios. The deal team also cooperated successfully with other multilateral financial and development institutions to create a strong financing structure.

[17] Under Section 4 of the Sponsors Support Agreement, International Power PLC (the sponsor) has procured through ENGIE S.A. (parent company), on behalf of the company, a debt service reserve account letter of credit (DSRA LC) in favor of Standard Chartered Bank (as Security Trustee). The DSRA LC has been issued for a period of 1 year up to 27 November 2020, renewable annually thereafter.

[18] The six sensitivity scenarios were: generation capacity increase, O&M cost increase, heat rate higher degradation, construction delayed by 3 months, Pakistan rupee depreciation.

38. **Monitoring and supervision** is rated *satisfactory*. The portfolio team closely monitors Uch-II's operating and financial performance through regular communication and follow-up on the timely submission of reports and financial statements. Some supervision visits were postponed due to security-related issues and the COVID-19 situation. The company complied with all reporting requirements. Uch-II has implemented the environmental and action plan as advised by ADB. The deal team has also been prompt in processing waiver requests from the company with regard to the existing agreements. Throughout the project supervision, annual and quarterly monitoring reports have been completed in a timely manner and covenants have been monitored closely.

39. Taking into consideration the team's performance at different stages of the project as described above, ADB's overall work quality throughout the project is rated *satisfactory*.

F. Overall Evaluation

40. Overall, the project is considered *Successful.*

III. ISSUES, LESSONS, AND RECOMMENDED FOLLOW-UP ACTIONS

A. Issues and Lessons

41. Use of indigenous low-cost resources to produce electricity is one of the key success factors for the long-term sustainability of the project. This is a positive lesson learned from the experience with Uch-II. The company provides affordable electricity in Pakistan and remains ranked high in the offtaker's merit order list based on its economical tariff.

42. Careful risk assessment of potential force-majeure events considering the climate conditions in the region should be conducted during project appraisal. Uch-II's commercial operation date was delayed by 148 days due to heavy rains and flooding at the site.

43. Transmission lines should be made available on time to unlock the full potential for power dispersal from the project. Uch's completion of transmission lines was delayed until May 2018. The issue of timing misalignment between the construction of a power plant and transmission lines is quite common and one of the challenges in Pakistan. The construction of a new plant is often developed by private investors with private financing, while the transmission lines tend to be developed by the government with sovereign financing. To address this issue, ADB might consider (i) engaging in a dialog with NTDC, which was obligated to complete the transmission lines; and (ii) coordinating with sovereign lenders with regard to financing of the transmission lines construction. This situation cannot be fully controlled by the lenders, however, because transmission lines completion is on the government's initiative. It is also worth highlighting that despite the delays in project completion, Uch-II has been one of the most successful projects in the power sector of Pakistan, largely because of the strong commitment and support from the project's sponsor and investors. Collaboration with other multilateral development institutions was also successful, and that helped in structuring robust financing for the project.

44. Careful assessment of political and regulatory risk is required. The deal team identified those risks during the project due diligence. It was expected, however, that the project would continue to receive strong support from the Government of Pakistan. The government has recently announced its plan on power sector reforms to address the circular debt issue that has

not been resolved as of today. There is a risk that the upcoming reforms might change the risk profile of the Uch-II project for ADB. Discussions between the government and independent power producers are ongoing. Coordinated institutional efforts and cooperation with other lenders are needed in order to convey ADB's position to the borrower and the government.

B. Recommendations and Follow-Up Actions

45. The deal team should maintain regular contact with Uch-II and with other financiers to receive updates on any changes or potential impact of the upcoming reforms on the project's performance. The deal team also should coordinate effectively with the regional departments in approaching relevant government officials in Pakistan to discuss ADB's concerns and position with respect to the power sector reforms and resolution of long-standing issues in the sector.

PROJECT-RELATED DATA

Table A1.1: Investment Identification

1.	Country	Pakistan
2.	Project Number	43903-014
3.	Loan Number	2722
4.	Type of Business	Energy
5.	Project Title	Uch-II Power Project
6.	Investee Company and/or Borrower	Uch-II Power (Private) Limited
7.	Amount of Approved ADB Assistance	ADB: loan – $100.0 million and guarantee – $50.0 million
8.	Other Funding	IDB: Islamic finance facility – $90.0 million IFC: loan – $100.0 million KEXIM: loan – $100.0 million International commercial bank loans (guaranteed by ADB PRG): $50.0 million Local commercial bank loans: $20.0 million Equity – $123.3 million

ADB = Asian Development Bank, IDB = Islamic Development Bank, IFC = International Finance Corporation, KEXIM = Export–Import Bank of Korea, PRG = partial risk guarantee.
Source: ADB. 2010. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Partial Risk Guarantee Investment to Uch Power (Private) Limited in the Uch-II Power Project in Pakistan.* Manila.

Table A1.2: Investment Data

1.	Concept Clearance Approval	29 January 2009
2.	Date of Board Approval	13 December 2010
3.	Signing Date of Legal Agreements	20 January 2011
4.	Terms of loan	14 years, including 3 years grace Pricing for USD loan: LIBOR + 4.50% Pricing for Euro loan: EURIBOR + 4.50%
5.	Disbursements	First disbursement: 31 May 2011 Last disbursement: 25 March 2014
6.	Repayments	Initial repayment date: 31 March 2014 Final repayment date: 31 December 2024
7.	Commissioning	4 April 2014

Source: Asian Development Bank.

Table A1.3: Summary of Project Cost and Funding Sources

Project Cost	**RRP Amount** ($ million)	**Actual Amount** ($ million)	**Actual Percent of Total**	**Amount Approved by NEPRA** ($ million)
EPC costs	370.3	368.2	76.9	368.0
Importation cost	18.6	22.7	4.7	22.7
Mobilization cost	29.3	25.6	5.3	21.4
Project development cost	6.0	13.1	2.7	8.5
Colony	5.1	6.0	1.3	5.1
Advisor fees	2.5		0.0	
Interest during construction	61.4	43.2	9.0	37.7
Total	**493.1**	**478.9**	**100.0**	**463.4**

EPC = engineering, procurement, and construction; NEPRA = National Electric Power Regulatory Authority; RRP = report and recommendation of the President.
Note: Numbers may not sum precisely because of rounding.
Source: ADB. 2010. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Partial Risk Guarantee Investment to Uch Power (Private) Limited in the Uch-II Power Project in Pakistan.* Manila.

RESULTS AND RATINGS FOR PROJECT CONTRIBUTIONS TO PRIVATE SECTOR DEVELOPMENT AND ADB STRATEGIC DEVELOPMENT OBJECTIVES—INFRASTRUCTURE

Results area	Actual achievements	Rating[a]	Justification	Potential future achievements	Risk
1. Within company PSD effects					
1.1 **Improved skills.** New or strengthened strategic, managerial, operational, technical or financial skills.	Developed stronger managerial and technical skills as a result of various training programs. Improved safety skills of staff for operating in safe and accident-free environment as a result of robust health, safety, and environmental (HSE) policies and procedures and security training for personnel. As an outcome, Uch-II achieved 1.81 million safe working hours without lost-time incident between March 2017 and June 2020.	Satisfactory	14 employees completed trainings on managerial skills, 22 employees had technical training. HSE training was conducted on-site and off-site for all staff during 2019. Institution of Occupational Safety and Health (IOSH) Working Safely Course 5.0 was conducted at site for employees and contractor's key staff members by Manager HSE UPL. No reportable incident recorded during 2019.	Uch-II is committed to providing learning and development opportunities for staff on a regular basis and aims to further increase safe working hours.	Low
1.2 **Improved business operations.** Improved ways to operate the business and compete, as seen in investee operational performance against relevant best industry benchmarks or standards.	Increased energy generation, reduced power outage and improved technical and commercial availability.	Satisfactory	Energy generation increased to 2,538 gigawatt-hours (GWh) in 2019 from 2,001 GWh in 2014. Since commercial operation date, there have been on average just 2% forced outages. Technical availability improved to 95.7% in 2019 from 91.4% in 2014.	...	Low
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.	Uch-II established its corporate governance policies in line with ENGIE Group's policies and best practices.[1] Uch-II has a robust corporate social responsibility program for welfare of the local community. The program is focused on health, education, promotion of sports,	Excellent	The company renovated the dental unit of District Headquarter Hospital, Dera Murad Jamali that included surgery rooms, doctors' rooms, sterilization room, and patient waiting area. The company continued its	Continue other corporate social responsibility activities that were put on hold due to COVID-19: Uch-II contributes to funding of	Low

[1] ENGIE corporate governance policies: https://www.engie.com/en/group/ethics-and-compliance

Results area	Actual achievements	Rating[a]	Justification	Potential future achievements	Risk
	and relief efforts during natural calamities. In addition, in response to the coronavirus disease (COVID-19) situation, Uch-II has contributed to the Government of Pakistan's efforts to provide help in the local community affected by the pandemic.		higher education scholarship program for Balochistan-domiciled students. 26 scholarships were awarded to students of Bolan Medical College, Balochistan University of Engineering and Technology, and Sukkur IBA University. More than 700 books and 5 computers were donated to the newly established Dera Murad Jamali Public Library to encourage reading habits in the local community. Uch-II made a special contribution to the ongoing COVID-19 relief efforts by donating to the Prime Minister's Pandemic Relief Fund, distribution of 1,500 ration packs among vulnerable families facing economic hardship and donation of medical supplies to district health facilities and frontline health workers of Nasirabad District.	traineeship programs and operations of a community eye health center providing free eye treatment to the local community, including checkups, medicines, and surgeries.	
1.4 **Innovation**. New or improved infrastructure design, technology, and service delivery; ways to cover or contain costs, manage demand or optimize utilization; improved risk allocation between private companies and government; financial structure, etc.	Uch's advanced gas turbine control system, the operation and maintenance (O&M) agreement with UPL[2], and the agreement with General Electric (for the supply of parts and rendering of technical services) ensured proper operation of the project and risk mitigation.	Satisfactory	Uch-II installed state-of-the-art technology GE frame 9E gas turbines with advanced control system. The O&M agreement with UPL, which has a solid operating record of 20 years, of which 10 years are on self-perform basis. Uch-II has an agreement with GE (OEM for Gas Turbines) that helps	Smooth operations for the power purchase agreement term while following the maintenance regime. Major Inspection, Combustion Inspection, and Hot Gas Path	Low

[2] Both Uch-II and UPL are 100% owned and closely supervised by ENGIE. ENGIE is a major power sector player and a global reference in innovation, low-carbon energy and services.

Results area	Actual achievements	Rating[a]	Justification	Potential future achievements	Risk
			mitigate risks of operational efficiencies.	Inspection are scheduled for 2022, 2024, and 2026, respectively.	
1.5 **Catalytic element.** Mobilizing or inducing more local or foreign market financing or foreign direct investment in the company.	Asian Development Bank (ADB) involvement helped reduce risk perceptions of other lenders. International financial and development institutions participated in financing of Uch-II project. Working capital facility obtained from local financial institutions to mitigate liquidity risks.	Satisfactory	International Finance Corporation, Islamic Development Bank, and Export–Import Bank of Korea cofinanced the project in total amount of $290 million. In addition, Uch-II received a working capital facility of $20 million from a local bank.	The project's good operating and financial performance ensures timely repayment of the financial debt.	Low
2. Beyond company PSD effects					
2.1 **Private sector expansion.** Contribution by a pioneering or high-profile project that facilitates in its own right, or paves the way for, more private participation in the sector and economy at large.	More private participation and foreign direct investment in Pakistan's power sector.	Satisfactory	ADB invested in Engro liquefied natural gas regasification project in Pakistan: construction of a jetty and associated facilities, a 24-kilometer high pressure gas pipeline. ADB also invested in Foundation Wind Energy II: construction, erection, and operation of 50 megawatts (MW) of wind generation capacity, close to the port city of Karachi.	New generation capacity is expected through investment in other power projects in Pakistan (that would depend, however, on the outcome of the planned sector reforms).	Low
2.2 **Competition**. Contribution of new competition pressure on public and other sector players to raise efficiency and improve access and service levels in the industry.	Lower energy cost. Reliable capacity.	Satisfactory	Lower energy cost evidenced by Uch-II's tariff and one of the highest ranks in National Transmission & Despatch Company (NTDC) merit order list. Uch-II constantly meets the demand of NTDC.	...	
2.3 **Demonstration effects**. Adoption of new skills, improved infrastructure assets and services, more efficient processes, maintenance regimes, improved	Uch-II project demonstrated that using indigenous resources is important for the project sustainability and providing electricity at affordable tariffs.	Satisfactory	Proven track record of operations: Since Uch-II achieved its commercial operation date, there have been ca 2% of forced outages (which includes outages	O&M contracts and agreement with GE are expected to help maintain high operating efficiency.	Low

Results area	Actual achievements	Rating[a]	Justification	Potential future achievements	Risk
standards, risk allocation and mitigation beyond the project company.	Uch-II demonstrates high operating efficiency and follows a rigorous maintenance regime, as is evident from the performance indicators.[3]		due to external factors).		
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.	Project enables the production of low-cost, affordable energy; fuels the local economy via utilization of indigenous gas and domestic purchases; and contributes to government revenue through corporate taxes.	Satisfactory	The government derives high value benefits in the forms of taxes, duties, and gas infrastructure development from Uch-II project. The significant revenue for Oil and Gas Development Company (OGDC) ultimately benefits the government. This can be contrasted with the use of imported fuel, whereby the offshore supplier ultimately benefits and Pakistan's foreign exchange reserves are correspondingly depleted.	Project is expected to further contribute to the production of accessible energy, fuel the local economy via domestic purchases, and provide government revenue through taxes.	Low
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 finance.	Project fostered confidence among potential investors and lenders in the power sector of Pakistan	Satisfactory	In 2014, China Power Hub Generation Company under the China–Pakistan Economic Corridor began developing a coal-fired plant in Pakistan. In 2019, the $2 billion 1,320-MW coal plant began commercial operation.	Further investment for equipment upgrades in the power sector may be expected in the country.	Low
2.6. **Affected laws, frameworks, regulation.** Contributes to improved laws and sector regulation for public–private partnerships, concessions, joint ventures, and build–operate–transfer projects; and liberalizing markets as applicable for	...				

[3] National Electric Power Regulatory Authority. *State of Industry Report 2019*. https://www.nepra.org.pk/publications/State%20of%20Industry%20Reports.php

Results area	Actual achievements	Rating[a]	Justification	Potential future achievements	Risk
improved sector efficiency.					
3. Contribution to other ADB strategic objectives					
3.1 **Sector development outputs.** Contribution to other sector development outputs and outcomes not captured under point 2, such as capacity or network expansion.	Uch-II reduced Pakistan's energy deficit. The country was facing energy shortages of 5,384 MW during peak hours as of 30 June 2014.	Satisfactory	With inclusion of Uch-II, Pakistan's total nominal power generation capacity totaled 24,375 MW as of 30 June 2014. The Uch-II project added 380.75 MW of net capacity.	...	Low
3.2 **Sector development outcomes.** Contribution to other sector development outputs and outcomes not captured under point 2, such as increased infrastructure utilization or consumption, improved in-country connectivity, improved energy security.	Improved energy security for Pakistan. Uch-II is based on indigenous low British thermal unit (BTU) gas from a dedicated gas field having no other commercial use. This helps the country enhance its energy security by providing affordable electricity.	Satisfactory	Water and Power Development Authority has developed a 220-kilovolt grid station near Uch-II power station that ensures stable and reliable power supply to Nasirabad District benefiting more than 200,000 local people.[4] By utilizing indigenous gas, which has no opportunity cost, Uch-II brings foreign exchange savings to Pakistan.[5]	...	Low
3.3 **Inclusion.** Improved access to, availability or affordability of infrastructure services for the poor and other disadvantaged groups.	Increased dependable capacity is helping to avert power outages in deprived areas.	Satisfactory	The company provides electricity to communities in the largest and poorest province of Pakistan.	Increase power supply to other disadvantaged areas.	Low
3.4 **Job creation**. Creation of additional sustainable jobs or self-employment. Distinguish between jobs created within and beyond the company.	The project provided employment opportunities and prioritized hiring of local residents.	Excellent	As of end of 2019, the company employs 48 skilled and 5 unskilled local workers. During the construction phase, ~1,500 skilled and 500 unskilled local workers were hired.	Continue to employ local residents for technical positions and skill-based jobs.	Low
3.5 **Environmental sustainability.** Project net impact on greenhouse gas emissions; any other contributions to	Use of locally sourced low-BTU gas generates lower CO_2 emissions compared to coal power plant for the same power output. Actual average	Partially Satisfactory	Natural gas is considered clean energy and an alternative to other low-cost independent power producers, such as coal-	Further contribution to carbon dioxide emission reduction for the remainder of	Low

[4] Prior to the development of this grid station, electricity was provided from a distant location that resulted in supply of unstable and low-voltage power.
[5] Uch-II estimated that as of the end of FY2019 these saving amounted to approximately $282 Million (as per Uch-II's letter dated 11 August 2020 to the Committee for Negotiations with IPPs.)

Results area	Actual achievements	Rating[a]	Justification	Potential future achievements	Risk
environmental improvements.	annual CO_2 emissions of the plant is 2,131,232 tons CO_2 equivalent. The average CO_2 emission reduction is 278,979 tons CO_2 equivalent/year[6] when compared to coal power plant.		fired power plants. Lower net capacity factor contributed to lower than expected CO_2 reduction.	the plant's life.	
3.6 **Regional integration.** Project contributions to regional cooperation and integration by facilitating trade, cross-border mobility, cross-border power supplies, etc.	...				
4. Overall Rating[b]		**Satisfactory**			

[a]**The rating scale for each results area is: Unsatisfactory, Less than Satisfactory, Satisfactory, Excellent, Not applicable.** "Excellent" reflects a high level of achievement, usually exceeding targets. "Satisfactory" denotes a good level achievement in line with expectations and set targets. "Less than satisfactory" reflects a low level of achievement below expectations. "Unsatisfactory" reflects no achievement or significant negative effects. "Not applicable" is used if the project report and recommendation of the President does not mention this aspect in its presentation of envisaged project development results, project justification, ADB's additionality, or the design and monitoring framework itself, and if negative effects are not apparent.

[b]**The overall rating scale is: Unsatisfactory, Less than Satisfactory, Satisfactory, Excellent.**

Source: Asian Development Bank.

[6] ADB. 2017. *Guidelines for Estimating Greenhouse Gas Emissions of Asian Development Bank Projects: Additional Guidance for Clean Energy Projects*. Manila. Emission factor of 0.8871 tons CO_2 equivalent/megawatt-hour for subcritical coal power plant using sub-bituminous coal was from Table A1.

SECTOR REVIEW

A. Macroeconomy

1. **Devaluation of Pakistan rupee.** As the central bank (State Bank of Pakistan) has adopted a market-based exchange rate mechanism, the Pakistan rupee has lost more than 50% of its value against the US dollar in a series of steep depreciations that began in November 2017. This is driven by domestic demand growth exceeding the economy's capacity, leading to fiscal and current account deficits, and ultimately causing the economy to overheat. These high fiscal and current account deficits are responsible for continuous buildup of domestic and foreign debts.[1] This devaluation is expected to continue throughout 2019–2023 due to the tightening of monetary policy under advice of the International Monetary Fund, the drastic and unprecedented global crisis related to the COVID-19 pandemic (which led to lockdown in Pakistan since 21 March 2020), and the worst locust plague since 1993. As a result, inflation will increase and growth will slow.[2] This does not bode well for the power sector, whose tariff structure is indexed to the USD. Pressure remains on the rupee, which may further decline.

2. **Weakening sovereign and deteriorating power sector.** COVID-19 has impacted Pakistan's already weak economic situation. Considering the economic impact and financial strain of COVID-19, Moody's Investor Service has revised the country's growth forecast down to 2%–2.5% for 2020 from the previous 2.9%. Moody's also has noted a "marked weakening in debt metrics," reflecting record-high external debt and large gross borrowing needs. In a recent report, the World Bank has advised that Pakistan may fall into a recession. The government is seeking additional support from multilaterals as well as debt relief. The International Monetary Fund is in the process of releasing a $1.4 billion loan under its Rapid Financing Instrument. The government has also been in discussions with multilateral lenders to defer debt payments. Circular debt continues to grow unabated, has reached $12 billion, and is now equal to 3.8% of Pakistan's gross domestic product. Measures taken to date, including to hike end user tariff, have been ineffective in stemming circular debt's growth.

B. Overview of Pakistan's Energy Sector

3. The Power Division of the Federal Ministry of Energy is responsible for providing strategic guidance, setting policies, and coordinating and supervising organizations within Pakistan's power sector. The provincial governments also have their own energy departments that can and do implement power projects within their provinces. Pakistan's electricity sector is regulated by the National Electric Power and Regulatory Authority (NEPRA), whose independent mandate oversees generation, transmission, and distribution. Power generation is provided by state-owned generation companies for thermal power, the Water and Power Development Authority for hydropower, and independent power producers (IPPs).

4. The national electricity transmission system is run by the state-owned National Transmission & Despatch Company (NTDC), which transmits power between generators and the state-owned distribution companies that serve consumers. The NEPRA Amendment Act, 2018 entirely changed the concept of distribution companies' exclusivity to distribute electricity to consumers in their respective service territories. NEPRA in its earlier reports has emphasized that the majority of power is purchased from generators on behalf of the distribution companies

[1] ADB.2018. *Country Partnership Strategy: Pakistan 2020–2024*. Manila.
[2] Economist Intelligence Unit. 2019. *Country Report Pakistan*. London (17 September).

by the Central Power Purchasing Agency, which acts as Pakistan's power market operator. The exception is K-Electric, a vertically integrated, private company that provides power generation, transmission, and distribution to the Karachi metropolitan area. Finally, the Alternative Energy Development Board is an autonomous body under the Ministry of Energy whose role is to promote and implement renewable energy projects in Pakistan. That role is critically important given the need to leverage domestic natural resources in order to curtail fossil fuel imports.[3]

5. Other agencies related to the power sector include the Planning Commission, which carries out integrated energy planning; the Private Power and Infrastructure Board, which functions as a "one-window" office for private developers in power generation; and the National Energy Efficiency and Conservation Agency, which leads energy efficiency and conservation activities through development plans and policies, labelling, information outreach, and training.[4]

C. Energy Generation

6. When the proposal was prepared, as stated in the report and recommendation of the President (RRP), electricity generation capacity had fallen behind demand, resulting in average electricity shortfalls of 3.5–5.0 gigawatts (GW) during peak times and frequent blackouts and brownouts. The government decided to implement several energy expansion initiatives, with emphasis on developing indigenous resources. These initiatives included expanding thermal, hydro, and wind power generation capacity by IPPs under the government's Power Policy 2002, procuring power from rental power plants under short-term agreements, securing electricity and gas imports from regional projects, and tapping into the huge potential of renewable energy sources. Simultaneously, improving transmission and distribution efficiency was a key area where ADB has been assisting the government's program through its public sector operations.[5] From 2009 until 2018, the generation capacity increased from 20.4 GW to 32.5 GW.

Table A3.1: Pakistan's Electricity Market Composition

	31 Dec 2009 Capacity	2017/2018				
		Capacity		Generation		Capacity
Source	GW	GW	%	TWh	%	**Utilization**
Oil, Gas, LNG	13.2	18.6	57.2	82.4	61.0	48%
Coal		2.7	8.4	11.9	8.8	59%
Hydro	6.5	8.2	25.4	28.2	20.9	44%
Nuclear	0.4	1.3	4.0	8.7	6.5	79%
Wind		0.9	2.9	2.1	1.5	29%
Solar		0.4	1.2	0.7	0.5	22%
Bagasse and rentals	0.3	0.3	1.0	1.1	0.8	40%
Total	**20.4**	**32.5**	**100.0**	**135.1**	**100.0**	

GW = gigawatt, LNG = liquefied natural gas, TWh = terawatt-hour.
Sources: National Power Control Centre Daily Log report 1 January 2010; KESC Loan Dispatch Center report 1 January 2010; and Institute for Energy Economics and Financial Analysis. 2018. *Pakistan's Power Future*. Lakewood.

[3] Source: Institute for Energy Economics and Financial Analysis. December 2018. *Pakistan's Power Future*. Lakewood.

[4] ADB. 2019. *Pakistan: ADB's Support to Pakistan Energy Sector (2005–2017).* Manila.

[5] ADB. 2006. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to the Islamic Republic of Pakistan for Power Transmission Enhancement Investment Program.* Manila; ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to the Islamic Republic of Pakistan for Power Distribution Enhancement Investment.* Manila; ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Cofinancing to the Islamic Republic of Pakistan for Energy Efficiency Investment Program.* Manila.

7. **Energy mix.** The power industry in Pakistan is a mix of thermal, hydro, and nuclear power plants. From 2010 to 2019, thermal power plants continued to account for two-thirds of capacity (or 67%) and 70% of power generation, hydro plants contributed 30%, and renewable and nuclear plants provided the remainder. Thermal power plants used imported fuel oil to meet 50% or more of their fuel needs, and the balance was based on gas. Fuel oil price escalation and volatility have eroded the viability and affordability of the sector.

8. **Renewable energy.** Renewables make up just 5.1% of installed capacity (2.8% of generation in 2017/18). While there has been some exploitation of Pakistan's plentiful wind and solar radiation resources, the number of wind and solar power installations remains low.

9. **Power demand analysis.** As of 30 June 2017, nearly 28 million consumers in different sectors of the economy were integrated into Pakistan's energy sector. Households were the largest consumers of electricity, followed by industrial, agricultural, and commercial consumers.

Table A3.2: Electricity Consumption by Sector, 2016–2017

	Number of Consumers (As of 30 June 2017)		Consumption (Year ending 30 June 2017)	
Consumers Category	Numbers	Percentage	GWh	Percentage
Household	23,937,200	85.5	48,055.1	48.2
Commercial	3,362,034	12.0	7,769.6	7.8
Industrial	356,913	1.3	23,951.6	24.1
Agricultural	326,143	1.1	9,222.1	9.3
Others	15,509	0.1	10,610.8	10.6
Total	**27,997,799**	**100.0**	**99,609.2**	**100.0**

Source: Government of Pakistan. 2017. *NEPRA State of Industry Report*. Islamabad.

10. **Power supply analysis.** The installed capacity does not fully contribute to energy production due to various factors like auxiliary consumption, impact of site reference conditions, and seasonality effects on the renewables and large hydropower plants.[6] Power shortages in Pakistan tend to be due to grid issues rather than a lack of generation capacity.[7] Based on NEPRA data, the overall thermal power capacity utilization (including coal plants) was just 40% in financial year 2018–2019. Pakistan in 2019 had more than 32,000 MW of installed capacity, but peak summer demand is nearly double the average for 6 months of the year. Lower annual capacity utilization further increases the cost of each unit generated. It may be noted that in 2021 and onwards the generation capability will exceed the demand.

Table A3.3: NTDC System Power Balance

Year ending 30 June	**Installed Capacity** (MW)	**Planned Generation Capacity as per NTDC** (MW)	**NTDC's Projected Demand Growth Rate** (%)	**NTDC's Projected Demand during Peak Hours** (MW)[a]	**Surplus / (Deficit)** (MW)
2019	35,924	26,887	3.9	27,261	(374)
2020	39,200	28,189	4.1	28,155	34
2021	42,008	30,582	4.2	29,325	1,257

[6] Government of Pakistan. 2019. *NEPRA State of Industry Report.* Islamabad.

[7] Institute for Energy Economics and Financial Analysis. 2020. *New Coal Power Plants Locking Pakistan into Too Much Supply and Unsustainable Capacity Payments.* https://ieefa.org/new-coal-power-plants-locking-pakistan-into-too-much-supply-and-unsustainable-capacity-payments/

2022	45,195	32,989	5.4	30,921	2,068
2023	48,915	35,896	3.3	31,953	3,943
2024	51,764	37,918	5.5	33,696	4,222
2025	57,224	39,157	5.1	35,422	3,735
2026	59,634	42,075	2.2	36,206	5,869
2027	60,758	40,433	5.6	38,227	2,206
2028	66,419	44,639	5.5	40,324	4,315
2029	67,559	45,437	5.4	42,519	2,918
2030	69,959	47,127	5.7	44,958	2,169

MW = megawatt, NTDC = National Transmission & Despatch Company.
[a] NTDC develops only demand projections for peak demand.
Source: NTDC as presented in Government of Pakistan. 2019. *NEPRA State of Industry Report.* Islamabad.

11. Capacity payments must still be made to power plants that increasingly may be sitting idle post COVID-19 amidst lower-than-expected power demand growth. Two more Chinese-financed coal-fired plants reached financial close in mid-2020, with more capacity in the pipeline intended to meet demand growth projections. High and growing capacity payments are making electricity more expensive and contributing to the accumulated circular debt within the power system that had reached about PRs2 trillion ($12 billion) as of mid-2020.

D. Financial Position

12. Circular debt starts with accumulation of payables due from the government to distribution companies. These are passed on to the generators and then to fuel suppliers. This circular debt causes delays in fuel supply to power generators, affecting generation capacity. Distribution companies are not able to charge the full cost-recovery tariff determined by NEPRA. The government has insulated low-income power consumers by providing subsidies to distribution companies, but delays in these government payments have resulted in revenue shortfalls for distribution companies and deferment of payments to nearly all power plants in the system. Power generation companies have seen their receivables rise, and generation companies have been forced to stop, delay, or reduce payments to their fuel suppliers to balance their cash flows. This has negatively impacted generation capacity. This issue is not new and has been partially mitigated in the past. It is once again becoming a growing problem that must be resolved if the potential of the private sector to address Pakistan's power deficit is to be unleashed. Measures are underway, but challenges remain.

13. A further contributor to circular debt is that distribution companies cannot recover all billable amounts. For FY2017, the recovery rate was 92% against a target of 100%. Another major factor contributing to circular debt consists in large transmission and distribution losses. The target for transmission and distribution losses for FY2017 was 15.3%. The actual loss was almost 18%. All of these aspects lead to cash flow problems, often leaving distribution companies unable to make timely payments to power producers.

14. **Lower oil prices offset sector costs but with limited near-term benefit.** The price of West Texas Intermediate crude oil fell 62% through the first four months of 2020 to reach $23.63 per barrel in April 2020. Because Pakistan generates 70% of its energy from thermal sources, this reduced generation costs. The near-term benefits are limited, however, as Pakistan is operating at 25% of installed capacity. This is mainly due to a COVID-19-driven lockdown that has forced industries, offices, and commercial activities to shut down.

E. Private Sector Investment in Pakistan

15. Pakistan has undertaken wide ranging reforms in the energy sector with help from ADB and the World Bank. In the early 1990s, the government, recognizing that the required investment in the sector could not be provided by the public sector alone, restructured and opened Pakistan's energy sector to private investment. Since then, Pakistan has had an influx of private sector investment in the energy sector, and more than one-third of generation is provided by IPPs as of 2019.

16. ADB has taken the lead in supporting the government's initiative to attract private capital into the energy sector through financing (i) the first private hydropower project, the New Bong Escape Hydropower Project; (ii) equity and a partial credit guarantee for a gas-fired combined cycle power project, the Daharki Power Project, using indigenous gas; (iii) privatization and expansion of both generation plants and distribution networks of the Karachi Electric Supply Company; and (iv) the Zorlu Enerji Power Project, the first private wind power project.[8]

F. Response by the Government of Pakistan

17. Since 2008, the government has begun efforts to resolve the circular debt problem by increasing consumer tariffs and by transferring the debt in the system to a newly established company outside the energy sector. ADB continues to support the government's sector reform program under the Accelerating Economic Transformation Program.[9]

18. In its 2017 State of the Industry Report, NEPRA noted with concern that the distribution companies had made little progress in addressing transmission and distribution losses and had requested higher allowable losses than previously proposed. It further identified Pakistan's high transmission and distribution losses as a major impediment to the power sector's financial sustainability, noting that these undermine the bankability of power purchase agreements. It also identified the need for government to assign high priority to the issue.

19. Electricity theft has also been a major contributor to losses. The estimated cost of power theft for FY2018 was more than PRs53 billion ($430 million) and the rate of theft from the grid at 3.9%. A Senate committee noted that unrecovered bills and transmission and distribution losses left an annual funding gap of PRs295 billion ($2.2 billion) in FY2018. Although part of this will be recovered through consumers' bills, around $900 million remains a burden on government, thereby becoming circular debt. To tackle the circular debt issue, the report recommended (i) an immediate injection of PRs400 billion ($3 billion) to prevent power plant closures, (ii) reduced reliance on imported fossil fuels, and (iii) increased emphasis on renewable energy.[10]

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[8] ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Laraib Energy Limited for the New Bong Escape Hydropower Project in Pakistan.* Manila; ADB. 2007. *Report and Recommendation of the President to the Board of Directors on a Proposed Equity Investment and Guarantee for Daharki Power Project in Pakistan.* Manila; ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed Loan for KESC Post-Privatization Rehabilitation, Upgrade and Expansion in Pakistan.* Manila; ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loan for Zorlu Enerji Power Project in Pakistan.* Manila.

[9] ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Program Cluster and Loans for Subprogram 1 to the Islamic Republic of Pakistan for Accelerating Economic Transformation Program.* Manila; ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Program Cluster and Loans for Subprogram 2 to the Islamic Republic of Pakistan for Accelerating Economic Transformation Program.* Manila.

[10] Institute for Energy Economics and Financial Analysis. December 2018. *Pakistan's Power Future*. Lakewood.

ENVIRONMENTAL IMPACT

A. Introduction

1. Uch-II Power (Private) Limited (the "company") implemented the design, construction, and operation of a 404-MW low British thermal unit (BTU) combined cycle power plant adjacent to the existing 586-MW Uch-I power plant (Uch-I, operational since 2000). The project is located in the Dera Murad Jamali Subdistrict of Balochistan Province, approximately 600 kilometers north of Karachi and 42 kilometers northwest of Jacobabad. It is situated on the premises of the Uch-1 power station, which is surrounded by a boundary wall and covers an area of about 260 hectares. The Uch-I plant occupies only about 30% of the available land. The remaining land was vacant. The project required about 85 hectares, including an area for residential facilities associated with the project. The power plant is located on barren land that is arid and remote, with no ecologically sensitive sites. The location of Uch-II next to Uch-I allowed for coordinated management of the two plants with respect to environmental, health, and safety impacts. The completed project consisted of two gas turbine generators, two heat recovery steam generators, one steam turbine generator, one condenser and multicell cooling tower, and balance-of-plant equipment. The project uses low-BTU gas and a high-speed diesel dual-fuel combustion system. Low-BTU gas is the primary fuel, but distillate liquid fuel is used for start-up and shutdown because these activities are not feasible with low-BTU gas. Project construction started in July 2011 and commercial operation commenced on 4 April 2014.

2. In compliance with the Safeguard Policy Statement (2009) of Asian Development Bank (ADB), the project was classified category A for environment. The company prepared an environmental impact assessment (EIA) report for implementation of the Uch II plant. The potential environmental impacts of the project were identified and effective measures to avoid, minimize, mitigate, and compensate for the adverse impacts were incorporated into environmental management plans (EMPs). National Transmission & Despatch Company and Oil and Gas Development Company also completed EIA reports, and no objection certificates were obtained from Balochistan Environmental Protection Agency (BEPA) in April 2013.[1]

3. This extended annual review exercise has evaluated the degree of health, safety, and environment (HSE) performance and compliance with ADB's Safeguard Policy Statement and applicable national and international regulations and standards based on desk review of available project documents and additional information provided by the company. Due to the pandemic, no actual site inspection and interview with company's HSE staff were conducted. Instead, ADB sent an environmental and social questionnaire to request additional information to substantiate the review and evaluation of project-related reports available in the ADB archive.

B. Desk Review Findings

4. **Compliance with ADB safeguards requirements.** The project's environmental and social impacts were adequately assessed in the EIA report (January 2010) and EIA report addendum (October 2010). The EIA was undertaken in accordance with Pakistan regulations and procedures, and the addendum with revised information was prepared in response to ADB comments. The EIA report was disclosed on ADB's website on 7 July 2010 following ADB's 120-day rule for disclosure of a category A project. The revised EIA was posted on ADB's website in December 2010. In compliance with ADB's monitoring and reporting requirements,

[1] The gas is supplied from the Uch Gas Field, which is about 47 kilometers from the Uch II site, using the existing pipeline to Uch I. To supply Uch II, an additional 15 new gas wells have been developed by Oil and Gas Development Company.

the company submitted quarterly and annual environmental and social monitoring reports to ADB from 2011 to 2019.

5. During the EIA process, meetings were held with various stakeholders to solicit and record their views and concerns for inclusion into project design at the project planning phase. The stakeholders consulted included some prominent nongovernment organizations, government officials, public representatives, and communities residing in the project area. Their views and concerns were acquired by various means and were incorporated into the EIA mitigation measures. This was in accordance with Pakistan's national regulations and fulfills ADB requirements for information disclosure.

6. **Compliance with national and environmental regulations.** In compliance with national regulations (PEPA IEE/EIA Regulation 2000), Uch II secured a no objection certificate from BEPA and was issued the permit on 9 December 2010. Extension of the environmental permit was a requirement before operations, and it was secured on 22 April 2014. As noted above, National Transmission & Despatch Company and Oil and Gas Development Company also obtained no objection certificates in April 2013.

7. The company secured a bulk water agreement with the Government of Balochistan for extraction of water from Pat Feeder Canal for the power plant's cooling water during operations. The feeder canal is approximately 3 kilometers distant and an existing water supply pipeline was used. A water reservoir and settling pond were built to store water during the Pat Feeder Canal's closure in the months of April and December.

8. **Environmental Management Plan and Monitoring Activities.** The project's EIA assessed the likely primary and secondary environmental impacts and risks during construction and operation, as well as cumulative impacts of the simultaneous operations of Uch-I and Uch-II.[2] The EIA also provided a change management plan to cover any unforeseen events and environmental conditions. The engineering, procurement, and construction (EPC) contractor was responsible for mitigating construction impacts, such as dust, noise from works and equipment, traffic, and solid and liquid wastes generated from the laborers' camp. Primary environmental impacts associated with operation were air emission, plant noise, wastewater, water use, greenhouse gas generation, and solid and hazardous waste management. These as well as occupational health and safety aspects were properly mitigated in implementing the EMP. Also, the company conducted environmental monitoring in the following areas: (i) wastewater analysis, (ii) water consumption at Pat Feeder Canal, (iii) volume of solid and hazardous waste generation; (iv) ambient and occupational noise levels, (v) ambient air testing and stack emissions monitoring through a continuous emission monitoring system and third-party contractor sampling and testing, and (vi) occupational health and safety. All the environmental monitoring results indicate overall compliance with applicable national and international environmental quality standards. The detailed monitoring results are reflected in

[2] Air dispersion modelling of the EIA shows that the increment impacts of Uch II (11 micrograms/cubic meter [$\mu g/m^3$] for 1 hour, and 1 $\mu g/m^3$ for annual average) are below 25% of the relevant NO_2 ambient air quality standards (50 $\mu g/m^3$ for 1 hour, and 25 $\mu g/m^3$ for annual average). The cumulative impacts of ambient NO_2 of Uch I and Uch II (43 $\mu g/m^3$ for 1 hour, and 4.7 $\mu g/m^3$ for annual average) still meet the relevant ambient air quality standards of NO_2 (200 $\mu g/m^3$ for 1 hour and 100 $\mu g/m^3$ for annual average). The noise levels of Uch II and Uch 1 are reduced due to the presence of a plant boundary wall that acts as a noise barrier.

the environmental and social monitoring reports submitted by the company on quarterly and annual bases to ADB.

9. High occupational noise levels observed around plant equipment were reported on some occasions (e.g., in 2016's fourth quarter). As part of high noise level control and mitigation measures, noisy equipment and apparatuses were placed inside an acoustic enclosure and silencers at intake and exhaust channels were provided. The project maintained its zero liquid discharge system using an evaporation pond, where all liquid effluents were treated. Wastewater entering the evaporation pond was periodically monitored (effluent flow, temperature, pH, total suspended solids, oil and grease). Water was conserved through reuse of drain water coming from the reverse osmosis plant. A designated landfill for disposal of food and kitchen waste was in place. Hazardous waste disposal was done through a waste contractor, but prior to collection a temporary storage area was allocated for hazardous waste. No major environmental and safety accidents have been recorded during the plant's operation.

10. **HSE Staff Capacity and Training Program.** During the construction phase, the EPC contractor carried out regular site HSE induction for its entire staff and subcontractors. Specific in-house training regarding environmental awareness, hazardous material, work at height protocols, confined space entry, heavy lifting, manual handling, firefighting, first aid, hot work, safe driving, scaffolding protocols, and other relevant topics were carried out by the EPC health and safety management team. General hygiene and health awareness were incorporated into site HSE induction training. The HSE department responsible for operation and maintenance of the Uch II power plant consisted of the following: (i) Manager HSE; (ii) Senior Manager for Operations; (iii) Manager for Operations; (iv) Deputy Manager for Chemical (effluent treatment, analysis and spill response); (v) HSE Officers; (vi) Senior Chemists (effluent treatment and spill response); (vii) Chemical Assistants (effluent treatment and spill response); Manager Administration/PR; (viii) Manager, Colony & Security; and (ix) Deputy Manager for Human Resource. Orientation on the health and safety management plan and all other applicable environmental and relevant laws and regulations was provided to the operation and maintenance team on a regular basis. Awareness sessions on "integrated management systems" sources were arranged on site for increasing employee awareness regarding the structure and functionality of the environment management and occupational health and safety management systems. The company's HSE staff was deemed to have sufficient capacity and knowledge to manage environmental and social issues.

11. **Third-Party Compliance Audits**. During construction, a biannual HSE audit was performed by a third-party consultant and audit results were shared with the EPC contractor for implementing corrective actions in a timely manner. In 2017, an environment audit by Ernst & Young was successfully completed for Uch Power (Private) Limited. No significant observation was recorded during the audit. Another corporate environmental audit was conducted by a third-party in 2018. In 2019, a surveillance audit for ISO 14001 was conducted. Uch Power (Private) Limited won the 16th Annual Environmental Excellence Award 2019 presented by the National Forum for Environment & Health for the fourth time in a row.

12. **Occupational Health and Safety (OHS) Plan and Implementation.** During construction, EPC contractors' activities were closely monitored by Uch-II HSE management to ensure compliance with EMP and health and safety procedures. No significant safety incidents occurred during construction. Independent third-party HSE audits were conducted and audit reports were shared with EPC contractors for close-out of corrective actions. The Uch-II HSE team conducted trainings such as a "confined space protocols" training session with the EPC contractor's engineering and supervisory staff. The EPC contractor developed standard

operating procedures for working near water, entering confined spaces, and a permit-to-work system procedure for use during the commissioning stage.

13. Community health, safety, and security were ensured at the project site through effective implementation of mitigation measures in the project EMP. These included (i) development of a traffic management plan to minimize disturbances to local communities, (ii) establishment of a grievance redress management system to handle and resolve any community complaints that might arise during construction and operation phases, and (iii) limiting the nonlocal staff within the boundary wall of the power plant to avoid project workforce and community interaction. The EPC contractor's standard operating procedure for security arrangements was also in place.

14. There was one serious accident that led to a fatality in June 2013 during construction. That incident was investigated and weak control of safety harness was identified as the root cause. During operation, only one medical treatment injury occurred, in March 2017. This resulted in a heel bone fracture and ankle dislocation due to slippage while climbing down a ladder. Other incidents to date have included just two first aid injuries involving forehead bruises, swelling, and a cut. It was recorded that after resting those injured persons resumed working and sustained no further injury. All incidents were investigated, and corrective actions were implemented. Corrective actions and frequent safety audits and training helped in reducing the recurrence of these types of incidents. There was a fire incident on 3 June 2019 at Zone 4 SS-14 caused by overheating of cable terminations for a wastewater pump. This was addressed immediately. The company has demonstrated HSE management at the highest level. It has implemented several HSE initiatives, such as: (i) conduct of HSE site monitoring walks, fresh eyes observations, tool box talks, in-house safety training; (ii) routine fire drills and regular inspection of firefighting equipment; (iii) conduct of training on "Institution of Occupational Safety and Health (IOSH) Working Safely Course 5.0, "IOSH Managing Safely" courses, and point of risk assessment for operation and maintenance and contractor staff; (iv) provision of a well-equipped site medical center with a medical officer and two nurses available 24/7; (v) an annual medical surveillance program for employees; and (vi) a driver's awareness and training program to ensure community safety during road travel.

C. Conclusion

15. Based on documents and records reviewed, such as the EIA, EMP, and environmental and social monitoring reports, this review confirmed the project has generally complied with the requirements of ADB's Safeguard Policy Statement and national and local regulations. An environmental management plan has been fully implemented to mitigate and control the assessed environmental impacts arising from air emission, water use, plant noise, wastewater, solid waste management, hazardous materials, and waste handling, as well as occupational and community health and safety aspects. An environmental monitoring program has been implemented to track the project's HSE performance against emission and effluent standards. A regular compliance audit has identified gaps in EMP implementation, and recommended minor corrective actions have been addressed in a timely manner. The company's HSE staff was deemed to have sufficient capacity and knowledge to manage environmental and social issues. The company has demonstrated its commitment to attain the highest level of HSE management. All incidents have been investigated and corrective actions implemented. Corrective actions and frequent safety inspections, audits, and training have helped reduce recurrence of any incidents during operation. The company has strictly complied with the requirement to submit comprehensive quarterly and annual monitoring reports to ADB for review and evaluation. The project is rated *satisfactory*, as it demonstrated compliance with ADB requirements on EIA preparation and EMP implementation and overall compliance with applicable national and international environmental, health, and safety standards and regulations.

SOCIAL IMPACT

A. Project Overview

1. The project involves the construction and operation of a 404-MW combined cycle gas-fired power plant in Dera Murad Jamali, Nasirabad District, Balochistan Province, Pakistan. Project components include power plant, raw water pond, evaporation pond, and a plant colony where housing and recreational facilities are located. Construction started in July 2011 and the plant became operational in April 2014. The nearest settlement site is 680 meters away, and the nearest villages are Goth Abdul Ghafoor Bhangar, Goth Babu Khaskali, Goth Faiz Muhammad Khan Jamali, and Goth Jeen Khan Bahrani. A settlement near the project area has emerged after the construction of Pat Feeder Canal and mainly after construction of Rabi canal in 2002. Settlements are mainly in the form of scattered hamlets comprising small clusters of houses. The area is more or less level, consisting of sparse vegetation adapted to grow under dry conditions and of low economic value. Livestock herding is one of the main occupations of communities near the project area. A review of the project's social impacts was undertaken, and the results are summarized below.[1]

B. Review Findings

2. **Involuntary resettlement and indigenous peoples.** The project was classified as category C both for involuntary resettlement and indigenous peoples impact. The project occupies the land that had been established for Uch-I (UPL) and did not lead to economic or physical displacement as the site had already been acquired and developed.[2] The whole site had been acquired in 1996 for the development of UPL. Based on the social compliance audit undertaken for the project, there are no outstanding land acquisition or compensation issues with respect to the land acquisition undertaken in the past for the site and right-of-way for the water supply and gas pipelines. A lease agreement was entered into by the borrower, Uch-II Power (Private) Ltd (or Uch-II), with UPL to establish the project and its facilities. A shared facility agreement has also been executed for a 660-meter gas pipeline and a 3-kilometer underground water pipeline that the project shares with UPL. There are no outstanding issues in relation to the land where the plant is located.

3. There was delay in constructing the 120-kilometer, 220-kilovolt transmission line (Sibi T/L) required by Uch-II for power dispatch. The National Transmission & Despatch Company (NTDC), as part of the power purchase agreement (PPA), is responsible for the Sibi T/L construction, which was completed only in May 2018. When the project became operational in 2014, an interim arrangement was provided by NDTC involving two short lines for power dispatch. Completion of Sibi T/L was affected by delay in bidding process, security restrictions, and a challenge in securing right-of-way given its length.

4. No indigenous peoples are affected by the previous land acquisition, as the lands were previously owned by the government and private owners. Although the residents of the villages

[1] Due to travel restrictions brought about by the coronavirus disease (COVID-19) pandemic, no site visit was undertaken. The assessment was based on review of relevant project documents (report and recommendation of the President to the Board of Directors, social compliance audit report, environmental impact assessment report and addendum, environmental and social monitoring reports, annual monitoring reports) and responses of the borrower via an environmental and safety questionnaire prepared by the Asian Development Bank (ADB) team.

located near the project area may have tribal affiliations,[3] the project including UPL operation did not in any way affect their dignity, human rights, livelihood systems, or culture. In addition, the land where the project is constructed is not owned, used, occupied, or claimed as ancestral domain or asset by any of these groups.

5. **Other social dimensions.** During the peak of project construction (second quarter of 2013), around 1,999 workers were engaged, of which 7% (133) are local people (all male) and 25 occupy skilled positions. During operation, Uch-II has engaged UPL for operation and maintenance services and hired no employee directly. UPL has a total of 135 employees working for Uch-II, of which 53 are dedicated to the project while the remaining 82 (management staff) have combined responsibility to oversee the operations of both UPL & Uch-II. Due to nonavailability of qualified women and the power station's being located in a remote location, hiring of women remains a challenge. However, there are 12 female staff members working in Uch-II's head office. There are no reported instances of noncompliance by the company, the contractor, or its subcontractors in relation to applicable national labor laws during construction and operation.

Table A7: Quarterly Employment Data during Construction[4]

Skill Level	Q1 2012		% Local	Q2 2012		% Local	Q3 2012		% Local
	Total	Local		Total	Local		Total	Local	
Skilled	641	8	1	732	12	1	684	19	2
Unskilled	106	71	10	201	102	11	268	130	14
Total	**747**	**79**	**11**	**933**	**114**	**12**	**952**	**149**	**16**

Skill Level	Q4 2012		% Local	Q1 2013		% Local	Q22013		% Local
	Total	Local		Total	Local		Total	Local	
Skilled	986	27	2	1,420	34	2	1,499	25	1
Unskilled	447	157	11	554	177	9	500	108	5
Total	**1,433**	**184**	**13**	**1,974**	**211**	**11**	**1,999**	**133**	**7**

Skill Level	Q3 2013		% Local	Q4 2013		% Local	Q1 2014		% Local
	Total	Local		Total	Local		Total	Local	
Skilled	1,552	22	1	938	13	1	428	30	5
Unskilled	407	92	5	236	77	7	120	35	6
Total	**1,959**	**114**	**6**	**1,174**	**90**	**8**	**548**	**65**	**12**

6. A workers' complaint mechanism was developed by the company, making available grievance register and complaint drop boxes at the site and camp. No complaints or issues have been raised to date. Furthermore, Uch-II has a dedicated ethics officer to whom employees can address any sexual harassment and/or other complaints. Individuals are also encouraged to raise questions and concerns regarding ethics. Uch-II also has a comprehensive whistleblower policy in place. Unskilled employees engaged by the engineering, procurement, and construction contractor during construction were also trained for better employment opportunities (during project operation and other job opportunities).[5]

[3] The surrounding villages have main tribal affiliations as follows: Bhangar, Bangul-zai, Bahrani, Jamali, Jakhrani, and Khosa. Other tribes in these villages are: Bbbor, Brohi, Bugti, Gola, Jat, Kaprani, Lahri, Lango, Lanha, Lashari, Machi, Marri, Pechwa, Raeesani, Solangi, and Soomro.

[4] Based on environmental and social monitoring reports.

[5] Unskilled workers were trained in the following aereas: work at height/use of scaffolds, confined spaces, manual handling techniques, hand injuries/pinch points, slip trip fall hazards, chemical & fuel handling, hot job safety, fire-fighting, burns first aid, health & hygiene, use of scaffold, grinder safety, defensive driving, hazardous materials,

7. **Stakeholder engagement and grievance redress mechanism.** Consultations were carried out with concerned institutions and nearby communities as part of the environmental impact assessment study for the project. The main objective at that time was to inform them of the proposed project and its potential impacts, obtain their views and concerns, and incorporate these to enhance the project design. Local communities are aware that they can approach the local government and any project staff during its meetings and engagements for project-related matters. Meetings are conducted regularly by the borrower with the local administration to understand community needs and issues. Requests made in relation to the company's CSR program are usually undertaken, provided that these activities comply with the company's CSR guidelines. Furthermore, the company regularly updates the government and local communities on its CSR initiatives and benefits derived, including information on local employment. No grievance has been raised in relation to the project to date.

8. **Corporate social responsibility activities.** Since the project became operational, it has been undertaking CSR projects together with UPL. The project, together with UPL, has been supporting the following flagship programs: (i) three primary and one secondary school built in collaboration with The Citizens Foundation (TCF) and having enrollment of more than 1,500 students from Dera Murad Jamali (DMJ) and adjacent areas;[6] (ii) a 14-bed fully equipped modern emergency care center at the district headquarter (DHQ) hospital, Dera Murad Jamali; (iii) 12 water filtration plants that provide clean drinking water to more than 30,000 people daily; and (iv) a skills training program for students at the power station with 18 trainees enrolled in the program in 2019.

9. Separately an agreement to establish a community eye health center at the DHQ hospital DMJ was signed between Uch and Layton Rahmatulla Benevolent Trust (LRBT), a nongovernment organization fighting blindness in Pakistan. The DHQ neonatal ward was also upgraded in 2017, and a mother's nursing room was constructed adjacent to it in 2018. The company is in the process of developing an equipped 12-bed female ward in the same hospital.[7] A two-day free medical camp at DHQ Hospital Dera Allah Yar and DHQ Hospital DMJ in collaboration with the district health department was also undertaken, whereby 1,500 underprivileged members of the local community received free check-ups and medicines.

10. The borrower and UPL are also continuously implementing its need-based higher education scholarship program for Balochistan-domiciled students, whereby scholarships have been provided to 37 students in 2019. The scholarship program priority to female medical students from Balochistan needing assistance and/or sponsorship. Annual sports tournaments in local schools and colleges have also been undertaken to promote sports, including for young girls, and sports facilities were upgraded at Girls Inter College, DMJ in 2018.

C. Conclusion

spill response, excavation safety, and use of personal protective equipment. The numbers of unskilled workers trained (by quarter) were as follow: 2013: 149 in Q1, 272 in Q2, 107 in Q3, 135 in Q4; 2014: 28 in total.

[6] These schools also support female education while taking into consideration a conservative tribal setup by providing a safe learning environment for female students where female education was previously uncommon. The female enrollment of TCF-Uch schools is 40%, which shows increasing support for female education in the local community. The schools provide job opportunities to women by keeping a 100% female faculty. The faculty receives regular training, which benefits the female staff members in their capacity development.

[7] Target construction date is 2020 and 2021.

11. Based on a review of documents and the borrower's response to the environmental and safety questionnaire, the borrower is compliant with ADB's social safeguard requirements and its social safeguards performance is rated *satisfactory*. ADB also notes that Uch-II's CSR program in partnership with UPL has significantly benefited the local communities in the area, including women and children.