

Project Administration Manual

Project Number: 47094-001
Loan Number: [TBD]
October 2013

Islamic Republic of Pakistan: Jamshoro Power
Generation Project

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Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with Government and Asian Development Bank (ADB) policies and procedures. The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

GENCO Holding Company Limited (GHCL), the executing agency, and Jamshoro Power Company Limited (JPCL), the implementing agency, are wholly responsible for the implementation of ADB financed projects, as agreed jointly between the borrower and ADB, and in accordance with the Government and ADB's policies and procedures. ADB staff is responsible to support implementation including compliance by GHCL and JPCL of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

At Loan Negotiations the borrower and ADB shall agree to the PAM and ensure consistency with the Financing and Project Agreements. Such agreements shall be reflected in the minutes of the Loan Negotiations. In the event of any discrepancy or contradiction between the PAM and the Financing and Project Agreements, the provisions of the Financing and Project Agreement shall prevail.

After ADB Board approval of the project's report and recommendation of the President (RRP) changes in implementation arrangements are subject to agreement and approval pursuant to relevant Government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval they will be subsequently incorporated in the PAM.

Abbreviations

ADB	=	Asian Development Bank
ADF	=	Asian Development Fund
AFS	=	audited financial statements
DISCO	=	distribution company
DMF	=	design and monitoring framework
EA	=	executing agency
EIA	=	environmental impact assessment
EPC	=	Engineering, procurement and construction
EMP	=	environmental management plan
GAACP	=	governance and anticorruption action plan
GENCO	=	government-owned generation companies
GDP	=	gross domestic product
GHCL	=	GENCO Holding Company Limited
GOP	=	Government of Pakistan
GWh	=	gigawatt-hour
HFO	=	heavy fuel oil
IA	=	Implementing agency
ICB	=	international competitive bidding
IFRS	=	international financing reporting standard
JPCL	=	Jamshoro Power Company Limited
LAR	=	land acquisition and resettlement
LIBOR	=	London interbank offered rate
MOF	=	Ministry of Finance
MOWP	=	Ministry of Water and Power
MW	=	megawatt
NTDC	=	National Transmission and Despatch Company
OCR	=	ordinary capital resource
O&M	=	Operations and maintenance
PAI	=	project administration instructions
PAM	=	project administration manual
PIC	=	project implementation consultant
PIU	=	project implementation unit
PMU	=	project management unit
QCBS	=	quality- and cost-based selection
RFP	=	request for proposal
RRP	=	report and recommendation of the President to the Board
SBD	=	standard bidding documents
SPS	=	Safeguard Policy Statement
SPRSS	=	summary poverty reduction and social strategy
TPS	=	thermal power station
TOR	=	terms of reference

I. PROJECT DESCRIPTION

1. Acute power shortages of up to 20 hours per day have crippled economic growth and caused social unrest in Pakistan.¹ The country needs affordable, dependable base-load power to alleviate the shortage. Coal-fired power plants provide secure, inexpensive base-load power in many countries. The project introduces supercritical coal-fired power generation, which is the best available technology for Pakistan. The environmental impact of this technology would be less than that of the existing heavy fuel oil (HFO)-fired power plants, and the more commonly used subcritical coal-fired power generation technology. The project, which is the first stage of a multi-stage government plan for this site,² has three components: (i) construction and 5 years of operational support for a 600-megawatt (MW) (net)/660-MW (nominal) supercritical coal-fired unit, with state-of-the-art emission control devices at the Jamshoro Thermal Power Station (TPS) in Sindh province; (ii) capacity development for coal-fired plant operations; and (iii) environmental remediation of the existing power generation units and site.

II. THE PROJECT

A. Rationale

2. Pakistan is exploring all options to reduce power load shedding and power cost but has few medium-term options for affordable, dependable power supply. Natural gas was the main fuel used for Pakistan's base-load power plants,³ but the country's dwindling reserves of gas have resulted in increasing use of high-cost imported fuel oil for power generation. This has increased power generation costs and exacerbated the existing financial shortfall, both within the sector and the national economy. Compared to existing, inefficient HFO-fired plants, the higher efficiency supercritical generation units and diversification away from imported fuel oil will enable Pakistan to increase its reliable supply of electricity and lower both costs and greenhouse gas (GHG) emissions.⁴

3. **Energy crisis.** Pakistan's energy crisis depresses its economic performance and fuels social instability. Power shortages equaled about one-third of total demand (4,000–5,000 MW) during most of fiscal year (FY) 2012.⁵ Increasing, unpredictable load shedding is estimated to constrain annual gross domestic product (GDP) growth by at least two percentage points. Small- and medium-sized enterprises that employ the largest number of people, but cannot afford back-up electricity generators and fuel, experience the largest impact. GDP growth has averaged 3% since 2007, while GDP growth of 7% is required to generate enough employment to absorb new labor market entrants. Poverty reduction and provision of basic necessities to the poor are immediate challenges for Pakistan. Low economic growth creates an environment for recruitment by society's radical elements. The government introduced, as a priority, the new

¹ ADB. 2013. *Asian Development Outlook 2013*. Manila.

² The government plans additional 600-MW supercritical coal-fired unit and conversion of existing units to coal.

³ Gas-fired power generation overtook hydropower in 1996 as the main power source. The share of gas in the thermal generation fuel mix has fallen from 56% (2006) to 44% (2011), while HFO increased from 42% to 54%.

⁴ The existing units at Jamshoro TPS use HFO and emit 930 grams of carbon dioxide (CO₂) per kilowatt-hour (kWh). The project would emit 750 grams of CO₂ per kWh and a subcritical unit 850 grams of CO₂ per kWh. Backup generators used to reduce power shortages are substantially less efficient and emit higher volume of CO₂.

⁵ Ending June 2012. Government of Pakistan, National Electric Power Regulatory Authority (NEPRA). 2012. *State of Industry Report 2012*. Islamabad.

National Power Policy to tackle these issues. PRs480 billion (about \$4.5 billion) was paid to fuel companies and independent power producers to clear payment arrears. The government is pursuing gas and power tariff rationalization and energy efficiency measures such as conservation, transmission and distribution loss reduction, and rehabilitation of power plants.⁶

4. **High-power generation cost.** Pakistan has 23,538 MW of installed power generation capacity and 14,000 MW of available capacity on average. Even for the available capacity, HFO-fired power plants are not fully utilized because of a shortage of funds for fuel. The increase in HFO-fired power generation (high production cost) is the major reason the cost-recovery tariff (average tariff) has continuously increased.⁷ The government has raised the base tariff by 106% from February 2008 to June 2013, despite this subsidy has increased to PRs5.79 per kilowatt-hour (kWh).⁸ This puts enormous pressure on the public finances and the country's balance of payments. For fiscal and economic sustainability, the government must lower electricity generation costs and increase supply to reduce adverse impact from power shortages.

5. **Lowering the generation cost.** The government aims to increase coal-based power generation while decreasing expensive HFO generation. This will require converting existing HFO generation units and constructing new plants.⁹ The imported HFO costs several times more than domestic or imported coal, and has higher sulfur content.¹⁰ Electricity generated from coal, through medium-term fuel supply contracts, will also help stabilize the power price. The National Power Policy includes plans to diversify the energy mix.

6. **Renewable and gas-based generation.** Improving energy security and affordability, the government is pursuing large hydropower, gas, and other projects using domestic resources. Pakistan has a low carbon footprint because of the large amount of hydropower and natural gas-based power generation. However, hydropower's contribution to total generation has declined,¹¹ and accounted for just 32% of power generated in 2012.¹² Only 6,716 MW of a potential of over 40,000 MW of hydropower has been tapped, making large hydropower plants the ideal solution. Although large hydropower is the least cost solution, the high capital cost, the long implementation period, and complex safeguard issues mean this is a long-term option. Small and medium sized run-of-the-river hydropower plants have shorter construction periods

⁶ Measures in the National Power Policy are reinforced through agreement with International Monetary Fund (IMF). IMF. 2013. *Pakistan: 2013 Article IV Consultation and Request for an Extended Arrangement Under the Extended Fund Facility*. Washington D.C.

⁷ HFO-fired power accounts for 34% of the energy mix; at PRs15.94 per kWh, it makes up 77% of total generation costs. In comparison, the hydropower cost was PRs0.16 per kWh, and gas PRs4.24 per kWh (footnote 5). The cost-recovery tariff has risen from PRs5.5 per kWh in 2008 to PRs14.51 per kWh in 2013.

⁸ The subsidies vary monthly according to the consumer mix, load factor, and whether a periodic fuel price adjustment was applied during the period. The average tariff increased from PRs4.26 per kWh to PRs8.81 per kWh in May 2012, and further to PRs 11.11 per kWh in August 2013.

⁹ Emissions for conversion from HFO to gas fired plants would vary according to the state of the existing equipment. For the Jamshoro TPS oil-fired units, after conversion the emissions would increase to 1,172 grams of CO₂ per kWh using imported sub-bituminous coal.

¹⁰ Fuel cost savings between a new HFO fired power generation plant and the project would be \$535 million annually.

¹¹ Hydropower's share declined as follows: 72% (1980), 54% (1990), 35% (2000), 32% (2012).

¹² Government of Pakistan, National Transmission and Despatch Company. 2012. *Power System Statistics 2011–12*.

but have seasonal and daily output variation which makes them unsuitable for base-load.¹³ Domestic gas-fired generation will decline from the current 26% with the depletion of existing gas fields, and competing demand from industry, transport, and retail customers unless domestic gas supplies are increased.¹⁴ The abundant wind and solar resources are being developed, but their outputs are variable and would not meet the base-load requirements.

7. **Power generation mix.** Oil-fired power generation is expensive, and used for less than 5% of world generation. To be competitive economically, Pakistan cannot afford continued reliance on expensive imported oil for 34% of power generation. Pakistan has one of the lowest carbon emissions, 19% of the world's average.¹⁵ Coal reserves in Pakistan may generate 10,000 MW of power for 350 years. Globally, coal-based power plants generate 40% of power,¹⁶ but account for just 0.07% of generation in Pakistan.¹⁷

8. **ADB interventions.** ADB is engaged in the energy sector through its four multitranches financing facilities and private sector investments, which fund energy efficiency, transmission, distribution, and renewable energy projects including eight hydropower and two wind power projects.¹⁸ As the sector's largest donor, ADB conducts policy dialogue on reforms, planning, and provides sector assessments to the International Monetary Fund. Ongoing reforms follow the recommendations of the Friends of Democratic Pakistan Energy Sector Task Force, which ADB co-chaired with the government. The report addresses diversification of existing fuel sources.¹⁹

B. Impact and Outcome

9. The project's impact will be an enhanced energy supply in Pakistan. The outcome will be a more efficient energy mix through diversification from expensive HFO to less expensive coal.

C. Outputs

10. The project will (i) increase capacity of the Jamshoro TPS by installing a 600-MW (net) supercritical coal-fired unit, using an 80/20 blend of imported sub-bituminous coal and domestic lignite when available,²⁰ and provide 5 years of operation and maintenance (O&M) support; (ii) ensure compliance with the national environmental standards (install emission control devices

¹³ Summer and winter output varies by around 3,000 MW. The government has spent \$20 million for the feasibility study of 4,500MW Diamer Basha Dam. The cost is estimated at \$12 billion and construction period of 10 years. Ranking of priority projects and sector roadmap are set out in Friends of Democratic Pakistan. 2012. *A Productive and Water-Secure Pakistan*. Islamabad.

¹⁴ Natural gas imports are being explored through pipeline gas and liquefied natural gas. The projects have faced delays. ADB has been the secretariat for the project to pipe gas from Turkmenistan to Pakistan since 2003.

¹⁵ Pakistan's carbon emission per capita is 0.81 tons per year according to the International Energy Agency. 2012. *CO₂ Emissions from Fuel Combustion*. Paris.

¹⁶ International Energy Agency. 2011. *Power Generation from Coal-Ongoing Developments and Outlook*. Paris.

¹⁷ The Lakhra Power Generation Company 150 MW fluidized bed combustion coal-fired power generation plant is the only coal-fired power plant in Pakistan. Only 30 MW is currently available from the units.

¹⁸ List of projects are in Development Coordination (accessible from the list of linked documents in Appendix 2).

¹⁹ Friends of Democratic Pakistan, Energy Sector Task Force. 2010. *Integrated Energy Sector Recovery Report and Plan*. 2010. Islamabad.

²⁰ In Sindh Province, usable coal production is expected in the next 5–7 years.

for the existing units and remediating the site);²¹ (iii) enhance capacity of GENCO Holding Company Limited (GHCL) and Jamshoro Power Company Limited (JPCL) by providing financial, technical, and operational training; and (iv) introduce education on coal-fired plant operation. The infrastructure will support government's plan to have an additional 600-MW unit at the same site. The design includes a flue duct interface that will allow adding carbon capture and storage (CCS) when the technology is available.²²

Annual Coal Consumption Estimate

	One unit		Two units	
	Domestic	Imported	Domestic	Imported
Blending ratio (%)	20	80	20	80
Fuel consumption per annum (Mt)	0.7	1.65	1.4	3.3
Total (Mt)	2.35		4.7	
Blending ratio (%)	0	100	0	100
Fuel consumption per annum (Mt)	0	2.05	0	4.1
Total (Mt)	2.05		4.1	

Mt = Million ton

Source: Asian Development Bank estimates

11. The imported sub-bituminous coal must meet the following specification requirement. The batch with properties beyond the limits showed in the following table will be rejected.

Designated Sub-bituminous Coal Properties

Properties	Values	Reject Limits
Calorific Value (LHV)	4,750 – 6,000 kcal/kg, or 20–25 MJ/kg, or 8,500 – 10,800 Btu/lb	<4,650 kcal/kg and > 6,000 kcal/kg
Ash (%)	10 – 12, however ash up to 16% could be considered	>17%
Hardgrove Index	45 – 60, however HIs up to 70 could be considered	<45% and >70%
Volatile Matter (%)	30 – 40	<28% and >42%
Total Sulphur (%)	Preferably <1%, but coal with TS <1.2% could be considered	>1.2%
Nitrogen (%)	Preferably <1%, but coal with N <2% could be considered	>2%
Total Moisture (%)	< 25% (Preferably <20%)	>26%
Initial Deformation Temp (°C)	> 1,150°C (Preferably > 1200°C)	< 1,150°C
Fuel Ratio (FC/VM)	<2	<1.5 FR
Size (mm)	0 – 50	> 5% retained on 50mm > 20% passing 1mm
Sodium in Ash (%)	<0.8	>1
Potassium in Ash (%)	<0.8	>1
Ash Base/Acid Ratio (%)	<0.11	>0.13

FC = Fixed Carbon, VM = Volatile Matter

²¹The project will also construct hazardous waste storage facility, colony wastewater treatment and landfill, rehabilitate effluent pipeline, and evaporation pond for the existing units.

²² Capacity development technical assistance, funded by the Carbon Capture and Storage (CCS) Fund, will determine the potential for CCS and explore the technology in Pakistan.

III. IMPLEMENTATION PLANS

A. Project Readiness Activities

Indicative Activities	2013												2014				Responsibility
	4	5	6	7	8	9	10	11	12	1	2	3	4				
Advance Contracting Activities																	
Project Implementation Consultant Recruitment																	
EOI advertisement			▼														GHCL & JPCL
Issue RFP to recruit PIC						▼											GHCL & JPCL
Prepare proposal																	Bidder
Firms submit proposals																	Bidder
PIC proposal evaluated																	GHCL & JPCL
Contract Award																	GHCL & JPCL
Technical Analysis Report																	USPC
Prepare ToR for Environmental Monitoring Expert in PMU																	HBP
Loan Negotiation																	GOP, ADB
ADB Board Consideration																	ADB
Loan Signing																	ADB, MOF
Government Legal Opinion																	GOP
Government Budget Inclusion																	GOP
Loan Effectiveness																	GOP, ADB

ADB = Asian Development Bank, EOI = expression of interest, GHCL = GENCO Holding Company Limited, GOP = Government of Pakistan, HBP = Hagler Bailly Pakistan (the firm recruited under the staff consultancy budget and the small-scale project preparatory technical assistance [S-PPTA] to do the environmental impact assessment), MOF = Ministry of Finance, PIC = project implementation consultant, RFP = request for proposal, TOR = terms of reference, USPC = US Power Consult Co. (the consultancy firm recruited under the staff consultancy budget and the S-PPTA to undertake the technical feasibility study).

IV. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Implementation Organizations–Roles and Responsibilities

Project implementation organizations	Management Roles and Responsibilities
<ul style="list-style-type: none"> • Economic Affairs Division 	Borrower <ul style="list-style-type: none"> ➤ Representing external borrowing ➤ Ensuring ADF financing proceeds are used in accordance with Subsidiary Financing Agreement (SFA) ➤ Handling of issues pertaining to project-related taxes and duties
<ul style="list-style-type: none"> • GENCO Holding Company Limited (GHCL) 	Executing Agency (EA) of the Project <ul style="list-style-type: none"> ➤ Supervising training, workshops and seminars for GHCL, other GENCOs and JPCL personnel ➤ Monitoring and coordinating ➤ Closely monitoring site remediation, implementation of the environmental management plan and ensuring that implementing agency comply with all other safeguard requirements ➤ Project progress reporting to MoWP and ADB
<ul style="list-style-type: none"> • Jamshoro Power Company Limited (JPCL) 	Implementing Agency (IA) <ul style="list-style-type: none"> ➤ Contract Management for the construction of the power unit ➤ Procurement of the contracts ➤ Contract Management and Supervision of project implementation consultants ➤ Supervising and ensuring safeguards compliance related with construction, installation of new equipment and the implementation of the Environment Management Plan (EMP) and Environmental Monitoring Plan ➤ Implementation of all aspects of the Project and Reporting to GHCL and ADB ➤ Submitting withdraw applications (WAs) to ADB ➤ Retaining all WA supporting documents
<ul style="list-style-type: none"> • Asian Development Bank 	Lender <ul style="list-style-type: none"> ➤ Main project financier
<ul style="list-style-type: none"> • Islamic Development Bank 	Lender <ul style="list-style-type: none"> ➤ Project cofinancier

B. Key Persons Involved in Implementation

Executing Agency

GHCL	Officer's Name: Sultan Muhammad Zafar Position: Chief Executive Officer, GHCL Email address: ceprojects786@yahoo.com Office Address: 197 WAPDA House, Lahore, Pakistan
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Implementing Agency

JPCL	Officer's Name: Iftikhar Aziz Position: Chief Engineer (Development), JPCL Email address: iftikharaziz@hotmail.com Office Address: Jamshoro Power Company Limited, Mohra Jabal Dadu Road, Jamshoro, Sindh, Pakistan
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ADB

Central and West Asia Energy and Natural Resources Division (CWEN)	Staff Name: Rune Stroem Position: CWEN Director Email address: rstroem@adb.org Telephone No: +63-2-632-6356
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Mission Leader	Staff Name: F. Cleo Kawawaki Position: Principal Energy Specialist Email address: fkawawaki@adb.org Telephone No: +63-2-632-6113
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C. Project Organization Structure

12. **Roles and Responsibilities of the Economic Affairs Division.** The Economics Affairs Division (EAD) is the borrower and is representing external borrowing. EAD will ensure that ADF financing proceeds are used in accordance with Subsidiary Financing Agreement (SFA) and EAD will also handle any issues pertaining to project-related taxes and duties.

13. The GENCO Holding Company Limited (GHCL) will be the executing agency (EA), and Jamshoro Power Company limited (JPCL) will be the implementing agency (IA) of the Project. Ministry of water and power will be the oversight body of the project. A project management unit (PMU) will be established within GHCL and a project implementation unit (PIU) will be established in JPCL. The GHCL and JPCL will be required to sufficiently staff the PMU and the PIU. A project implementation consultant (PIC) will also be hired under the Project to facilitate PIU and supervise the implementation works on behalf of JPCL as the "Project Manager".

14. **Roles and Responsibilities of GHCL (the executing agency of the project).** GHCL will be responsible for the following: (i) to coordinate activities between the IA, Borrower, MOWP ADB and IDB; (ii) support IA in developing project and in getting government approvals; (iii) ensure the IA comply with Loan covenants; (iv) ensure ADB is updated in a timely manner on any policy change that affects JPCL current status or activities; (v) support IA in preparation and approval of tariff determination/notification; and (vi) establish a dedicated PMU at GHCL level with the following responsibilities: monitor IA's implementation progress and its compliance with ADB's loan covenants; reporting project progress on a quarterly basis to ADB; hiring the PIC on behalf of JPCL; PMU will be headed

by General Manager Design and Development (GM D&D), who will be responsible for all GHCL related project responsibilities; the PMU Head will report directly to Chief Executive Officer (CEO) of GHCL and will be the focal point for ADB; PMU will be staffed with three Directors (i) Director Monitoring & Coordination, (ii) Director Technical and (iii) Director Environmental. The Directors will also be provided with supporting staff on as needed basis.

15. Roles and Responsibilities of JPCL (the implementing agency of the project).

After the loan agreement is signed, JPCL shall provide ADB the name of the authorized person who will sign withdrawal applications (WAs) together with the authenticated specimen signature of the same. Any subsequent change in the list of authorized representatives must be reported immediately and authenticated specimen signatures of new representatives must also be provided. The prescribed ADB WA form shall be used for submission consisting of the following: (i) the application itself in letter form; (ii) summary sheet(s) for each cost category claimed; (iii) supporting documents; and (iv) summary sheet(s) and supporting documents, which may be substituted by simplified documentation, as ADB approved. JPCL is required to retain all WA supporting documents and to enable ADB's representative to examine the same. Such records should be retained for at least 1 year following receipt by ADB of the final audited financial statements (AFS) or 2 years after the loan closing date, whichever is later. JPCL is responsible for ensuring that document retention also complies with their government's laws and regulations.

16. The IA will also be responsible for: (i) procurement of the EPC Contractor and other contractors; (ii) contract management and supervision of the EPC contractor; (iii) contract award, management and supervision of the project implementation consultants; (iv) ensuring compliance with safeguards requirements as per ADB policy; (v) report project progress on a quarterly basis to GHCL as well as ADB; (vi) ensuring compliance with loan covenants; (vii) conducting due diligence to ensure authenticity of information presented in proposals; (viii) ensuring timely submission of all variation orders and requests for no-objection approval by ADB for subcontracts constituting more than 10% of contract value; (ix) providing all necessary information required by ADB for the purpose of reviewing the compliance with loan agreement; (x) performing "the Employer" role for all contracts such as approving the invoices of the contractors once they have been verified by the "Engineer" (the PIC), monitoring the activities of the experts and approving design and variation requests of the contractor as verified/recommended by the PIC; (xi) verifying invoices of the PIC contract and reviewing and approving the variation orders to the PIC contract, and (xii) establishing PIU at JPCL. The PIU will be headed by a Project Manager (at least of the level of a Chief Engineer and will report directly to CEO JPCL) supported by Director Technical, Director civil (assisted by a structural engineer), Director Procurement (supported by a contract management specialist), Finance Manager (a professional accountant), Director Social Safeguard (assisted by an environment specialist and a resettlement specialist). Director technical will be assisted by a mechanical engineer, an electrical engineer, a control and instrumentation engineer, and a chemical engineer. JPCL will be responsible for securing all approvals from the competent authorities as per powers delegated in the "Book of Financial Powers". For all procurement activities, a procurement committee will be formed with the responsibility of calling tenders, evaluation and recommendation of award. The committee will be chaired by the PIU Manager and made up of the staff of the PIC; the director technical, the PIU's mechanical; civil engineer; electrical; control and chemical engineers. The Director Procurement will act as the secretary of the committee. The procurement committee will make its recommendations to the CEO JPCL who will secure such approvals of the BoD as may be necessary.

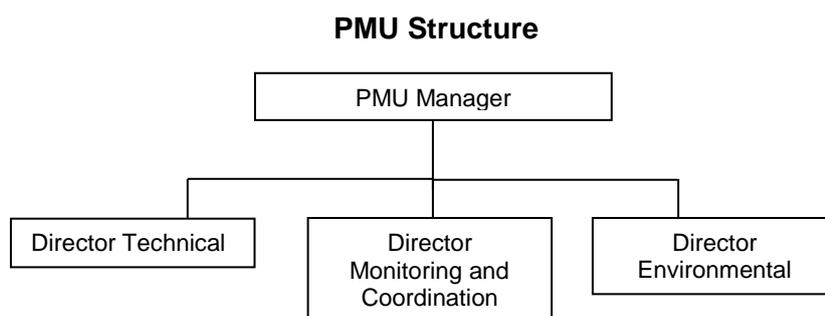
17. Roles and Responsibilities of PIC (The Project Engineer). The PIC will (i) prepare and issue bidding documents upon approval by the PIU Manager, (ii) undertake the day-to-day management of the bidding process (distributing documents, reviewing requests for clarification and drafting responses for PIU Manager's signature etc.), (iii) undertake due

diligence on proposals and for firms subsequently proposed to be subcontractors, (iv) provide qualified technical staff for the evaluation of bids and recommending award to the JPCL, (v) provide construction supervision and contract management both in the construction and O&M phase, (vi) monitor safeguard policies implementation, (vii) act as the “Engineer” and advise client on variation orders and other contractual issues, (viii) verify payments to the contract based on physical works and contract terms, and (ix) train staff in the companies held by GHCL including JPCL staff.

18. Advanced contracting will be undertaken. GHCL and JPCL will abide by ADB’s Procurement Guidelines (2013, as amended from time to time). The equipment and service, including the EPC contractor, will be procured through international competitive bidding (ICB). The EPC contractor will be responsible for the final design, procurement, and construction followed by a 5-year O&M period after commissioning.

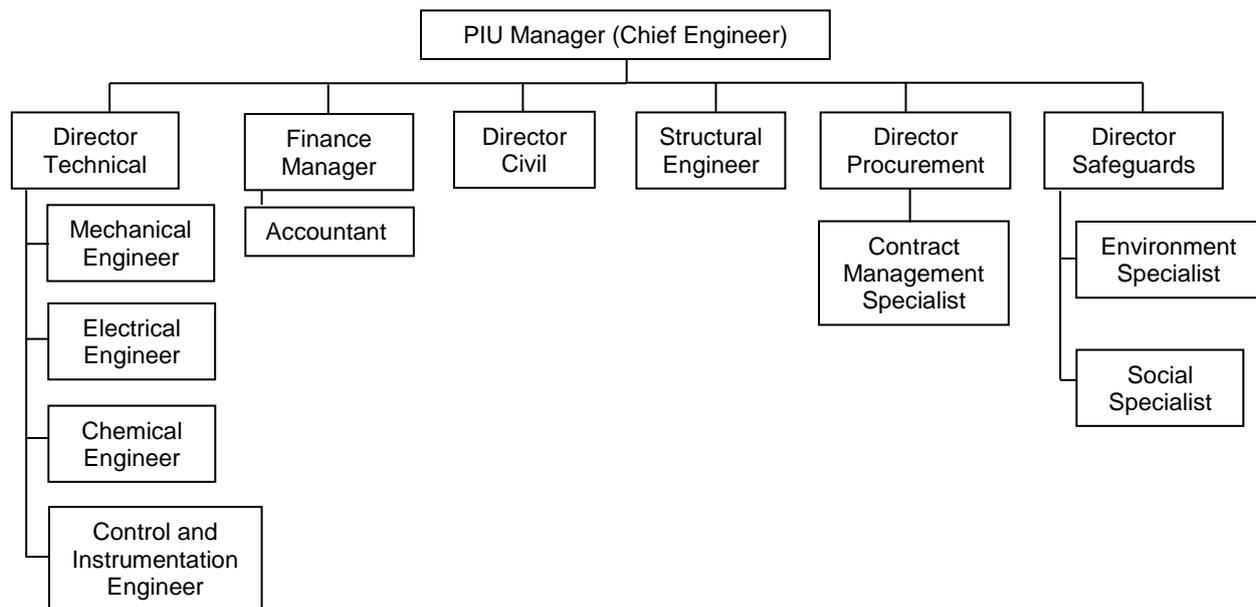
19. The PIU, assisted by implementation consultants, will submit necessary project plans, progress reports, applications for withdrawal of funds, and any other required reports to ADB and the Government.

20. The PMU structure up to director/manager level is as below. The GHCL may include supporting staff to the directors as needed for better supervision, coordination and work load.



21. The PIU will include the following positions. Additional support staff to the proposed positions may be added as per the work load requirements of JPCL.

PIU Structure



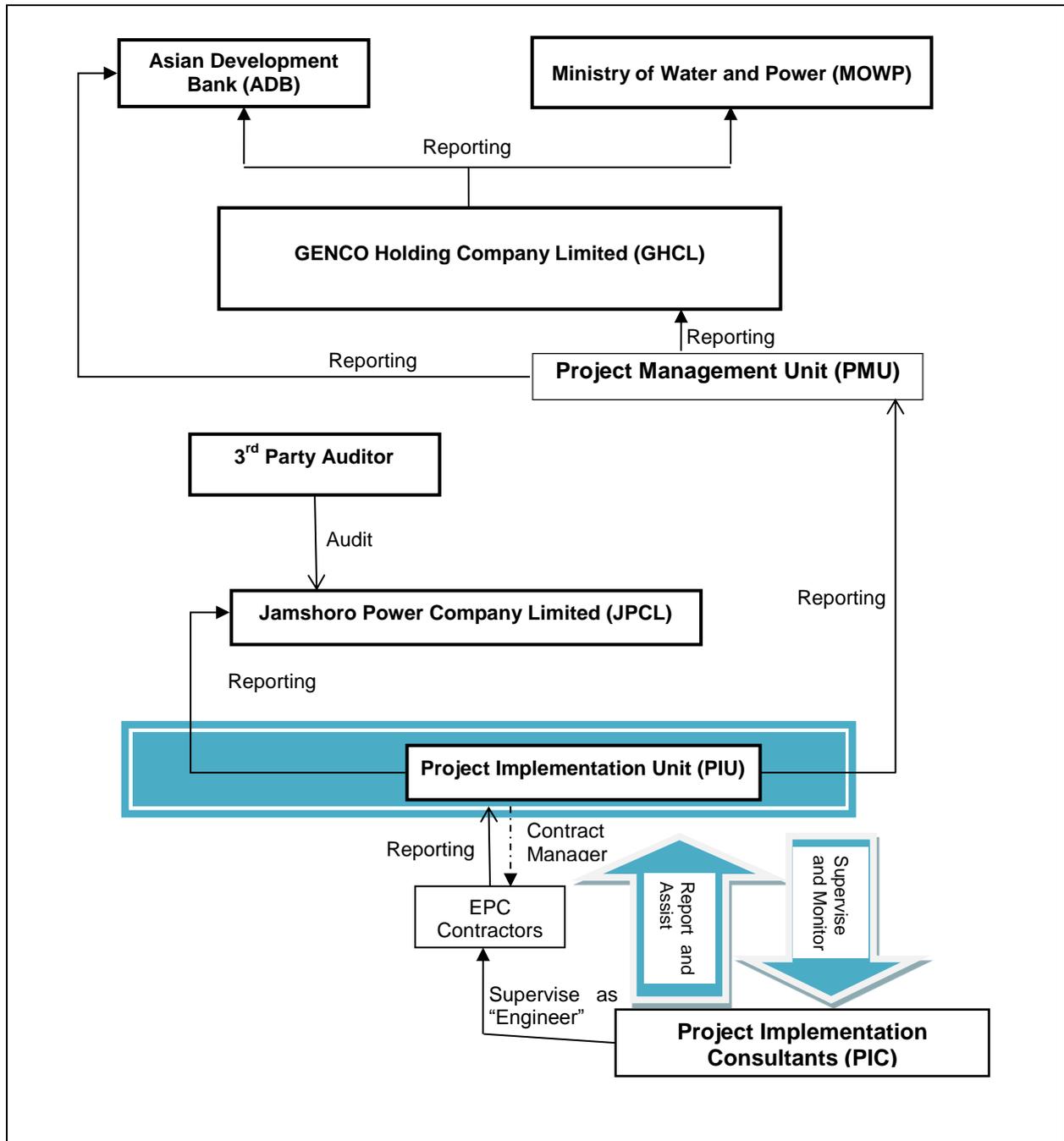
22. The PMU/PIU Project Manager and PMU/PIU staff will have appropriate academic qualifications with experience of working on large investment projects in their specialty area. The Director Procurement and Contract Management Specialist will have required academic qualifications with experience in procurement of consultants and contractors. The terms of reference of the key staff of the PMU and PIU are as follows:

Position	Terms of Reference
PMU	
PMU Manager	<ul style="list-style-type: none"> • Provide overall direction and management of PMU. • Focal point in communications and reporting with ADB, IDB, GHCL and JPCL. • Ensure overall project is delivered on schedule to budget and specification. • Ensure that due diligence is conducted on potential consultants, contractors, subconsultants and subcontractors. • Ensure appropriate reporting to financiers. • Monitor and ensure project covenants are met. • Ensure all safeguard requirements are satisfied. • Ensure CEO of GHCL is apprised of implementation status on a regular basis. • Coordinate training program. • Manage PMU staff.
Director Technical	<ul style="list-style-type: none"> • Support JPCL in recruiting PIC consultant. • Prepare request for proposals of consulting services and support JPCL in evaluating the proposals received. • Assist the GM (D&D) on all technical matters relating to the project.

<p>Director Monitoring and Coordination</p>	<ul style="list-style-type: none"> • Responsible for coordinating activities between the GHCL, JPCL, MoWP, ADB and IDB. • Prepare quarterly reports for ADB and IDB. • Coordinate review missions. • Assist GM (D&D) in evaluating/reviewing different aspects of the project.
<p>Director Environmental</p>	<ul style="list-style-type: none"> • Assist the GM (D&D) on all environmental matters relating to the project. • Prepare semi-annual environmental monitoring reports. • Ensure loan covenants relating to environment compliance are met.
PIU	
<p>PIU Manager</p>	<ul style="list-style-type: none"> • Provide overall direction and management of PIU. • Focal point in communications and reporting with ADB, GHCL and JPCL. • Act as contract manager for EPC contracts as well as the PIC contract. • Manage relationships with financiers, consultants, and contractors. • Ensure project is delivered on schedule to budget and specification. • Ensure appropriate reporting to financiers. • Monitor and ensure project covenants are met. • Ensure all safeguard requirements are satisfied. • Ensure CEO of JPCL is apprised of implementation status on a regular basis. • Manage project implementation consultants. • Manage PIU staff. • Responsible for approving the recommended variation orders by the Engineers.
<p>Finance Manager</p>	<ul style="list-style-type: none"> • Responsible for maintaining of project accounts and preparation of project financial reports. • Monitor cash flow movement and prepare trend analysis of key operating and financial ratios. • Monitor loan covenants. • Maintain separate project financial statements. • Prepare withdrawal applications for the project implementation contract. • Prepare project financial reports. • Responsible for ensuring that the record of the withdrawal applications is kept safe as available as per requirements of the project agreement. • Supervise the Project accountants in monitoring loan covenants. • Maintain project accounts.

<p style="text-align: center;">Director Safeguards</p>	<ul style="list-style-type: none"> • Ensure that the requirements identified in the Environment Management Plan (EMP) are included in the environmental mitigation EPC bidding document and contract. • Ensure the implementation and monitoring of safeguard requirements and published results in quarterly progress reports and semi-annual environmental monitoring reports. • Monitor and supervise consultant and contractors of the implementation of site remediation. • Supervise the PIC on mitigation measures and monitoring plan as specified in the EMP and ensure that the PIC submits semi-annual environmental monitoring reports. • Prepare internal monitoring reports. • Supervise PIC on the preparation of updated Environment Impact Assessment (EIA). • Ensure that land is acquired and LARP is implemented in accordance with ADB's policy. • Ensure that reporting on LARP is carried out in accordance with requirements set forth in the project agreement. • Ensure loan covenants relating to resettlement and environment compliance are met.
<p style="text-align: center;">Director Technical</p>	<ul style="list-style-type: none"> • Monitor and supervise PIU engineers, consultant and contractors. • Control schedule, quality, quantity, cost, and safety of all engineering works. • Coordinate with PMU Manager in monitoring the progress related to all engineering works. • Manage technical staff of PIU.
<p style="text-align: center;">Director Procurement</p>	<ul style="list-style-type: none"> • Manage consultant recruitment. • Manage the turnkey contract. • Prepare Request for Proposals for consultant services. • Prepare bid evaluation reports. • Monitor compliance of consultants and contractors with contract requirements. • Prepare overall project progress report. • Prepare contract award and disbursement projections.
<p style="text-align: center;">Director Civil</p>	<ul style="list-style-type: none"> • Monitor and supervise consultant and contractors of the civil construction. • Control schedule, quality, quantity, cost, and safety of civil works. • Coordinate with PMU Manager in monitoring the progress related to civil works.

23. The project's organizational structure and PIU staffing are shown below:



V. COSTS AND FINANCING

24. The Project costs consist of:

- (i) **EPC Contract** for the design, supply, installation, testing and commissioning of one supercritical unit at Jamshoro TPS.

Two other ICB contracts for the site remediation and installation of FGD for existing units and one NCB contract for site preparation.

These will be under JPCL's responsibility. They are financed out of the OCR loan proceeds which are relented by the Government to JPCL in accordance with the Subsidiary Financing Agreement (SFA).

Project Implementation Consultants (PIC) Services. The project implementation and management will be assisted by a team of PIC. The environmental monitoring will also be undertaken by PIC and included in its contract. An external monitoring agency will also be recruited by GHCL and JPCL to carry out monitoring implementation and validation of the different components of EMP and submit an independent monitoring and appraisal report to the PMU, GHCL.

This will be under JPCL's responsibility and recruited with GHCL's assistance. It is financed out of the ADF loan proceeds which are relented by the Government to JPCL in accordance with the SFA. GHCL and JPCL will provide necessary office space and office equipment as its share of the project cost.

- (ii) **Capacity Development Component.** The capacity development component will be financed out of the ADF loan proceeds which are relented by the Government to JPCL in accordance with the SFA.
- (iii) **Land Acquisition and Resettlement.** This will be financed by JPCL as government contribution.
- (iv) **Taxes and duties.** Taxes and duties will be covered under Government/counterpart contribution, or exempted, as their share of the project cost.
- (v) **Financial charges.** Interests during implementation and commitment charges will be capitalized in to the loan.
- (vi) **Operations and Management Escrow Account.** An escrow account in a bank acceptable to ADB and the EPC contractor will be set up by JPCL before commissioning and will contain one-year estimated operation and maintenance cost for the following year for the duration of the operations and maintenance contract. Should there still be a short-fall after exhausting the escrow account, OCR Loan 2 may be utilized to pay part or whole of the invoices from the EPC contractor if the short-fall is caused by non-performance by regulatory or other government entities despite the best efforts of JPCL.
- (vii) **Fuel Escrow Account.** An escrow account in a bank acceptable to ADB and the EPC contractor will be set up by JPCL before commissioning and will contain one-month estimated fuel cost for the following month for the duration of the loan.

25. Recurrent costs of the PMU and PIU are part of the project cost to be financed by GHCL and JPCL as part of the government contribution. However, these costs will be subject to audit and will be covered under the audited financial statement.

A. Detailed Cost Estimates by Expenditure Category (\$ million)

Item	Amount
A. Base Cost ¹	
1 Construction of Supercritical Power Plant	880.0
2 Environmental Remediation of Site	9.0
3 Site Preparation	5.0
4 Emission Control for the Site ²	160.0
5 Capacity Development ³	10.0
6 Land Acquisition and Resettlement	2.0
7 Implementation Consultant ⁴	15.0
8 O&M Service Contract ⁵	102.0
9 Recurrent Costs ⁶	8.0
10 Taxes and Duties ⁷	83.9
Subtotal (A)	1,274.9
B. Contingencies ⁸	
1 Physical	128.3
2 Price	47.1
Subtotal (B)	175.3
C. Financing Charges During Implementation ⁹	
1 Interest	46.0
2 Commitment Charges	3.7
Subtotal (C)	49.7
D. Total (A+B+C)	1,500.0

¹ In mid-2013 prices.

² Includes flue gas desulfurisation retrofit for existing units at JPCL power plant.

³ Includes technical training to be provided to JPCL staff on site (simulator) and through WAPDA College training courses.

⁴ Includes 10-year contract.

⁵ Includes 5-year O&M contract with spare parts.

⁶ Includes project management unit cost for 10 years and external audit cost.

⁷ 5% of total value of imported equipment and 15% of GST to be financed by the government.

⁸ Physical contingency at 10% of base cost. Price contingency calculated based on price escalation factors.

⁹ ADB OCR loan # 1 interest rate calculated at LIBOR 5-year fixed swap rates plus 0.4% margin and 0.1% maturity premium. ADB OCR loan # 2 interest rate calculated at LIBOR 5-year fixed swap rate plus 0.4% margin. Commitment charge for both ADB OCR loans at 0.15%. ADB ADF interest rate at 2%. IDB financing rate assumed to be at LIBOR 5-year fixed swap rate plus 1.15% spread.

Source: Asian Development Bank estimates.

B. Allocation and Withdrawal of Loan/Grant Proceeds

ALLOCATION AND WITHDRAWAL OF ADF PROCEEDS (Jamshoro Power Generation Project)			
CATEGORY			ADB FINANCING
No.	Item	Total Amount Allocated for ADB Financing (SDR)	Percentage and Basis for Withdrawal from the ADF Account
1	Capacity development	6,460,000	100% of total expenditure claimed*
2	Implementation Consultant (Construction Phase)**	9,238,000	100% of total expenditure claimed*
3	Interest during Construction	969,000	100% of total amount due
4	Unallocated	2,713,000	
	Total	19,380,000	

* Exclusive of taxes and duties imposed within the territory of the Borrower.

** Expenditures for the project implementation consultant (operational phase) will be financed under OCR loan 2.

ALLOCATION AND WITHDRAWAL OF OCR1 PROCEEDS (Jamshoro Power Generation Project)			
CATEGORY			ADB FINANCING
No.	Item	Total Amount Allocated for ADB Financing (\$)	Percentage and Basis for Withdrawal from the OCR Account
1	Construction of Supercritical Power Plants	660,000,000	100% of total expenditure claimed*
2	Environmental Remediation of Site	9,000,000	100% of total expenditure claimed*
3	Site Preparation	5,000,000	100% of total expenditure claimed*
4	Emission Control for the Site	32,000,000	20% of total expenditure claimed*
5	Interest and Commitment Charges	37,600,000	100% of total amount due
6	Unallocated	96,400,000	
	Total	840,000,000	

* Exclusive of taxes and duties imposed within the territory of the Borrower.

ALLOCATION AND WITHDRAWAL OF OCR2 PROCEEDS (Jamshoro Power Generation Project)			
CATEGORY			ADB FINANCING
No.	Item	Total Amount Allocated for ADB Financing (\$)	Percentage and Basis for Withdrawal from the OCR Account
1	Implementation Consultant	750,000	100% of total expenditure claimed*
2	O&M Service Contract	21,000,000	100% of total expenditure claimed*
3	Interest and Commitment Charges	2,550,000	100% of total amount due
4	Unallocated	5,700,000	
	Total	30,000,000	

* Exclusive of taxes and duties imposed within the territory of the Borrower.

C. Detailed Cost Estimates by Financier (\$ million)

Item	Amount	ADB		ADB		ADB		IsDB	Government		
		OCR 1		OCR 2		ADF					
A. Base Cost											
1 Construction of Supercritical Power Plant	880.0	660.0	75%	-	0%	-	0%	125.3	14%	94.7	11%
ADB Financed Portion	660.0	660.0	100%	-	0%	-	0%	-	0%	-	0%
Non-ADB Financed Portion	220.0	-	0%	-	0%	-	0%	125.3	57%	94.7	43%
2 Environmental Remediation of Site	9.0	9.0	100%	-	0%	-	0%	-	0%	-	0%
3 Site Preparation	5.0	5.0	100%	-	0%	-	0%	-	0%	-	0%
4 Emission Control for the Site	160.0	32.0	20%	-	0%	-	0%	-	0%	128.0	80%
5 Capacity Development	10.0	-	0%	-	0%	10.0	100%	-	0%	-	0%
6 Land Acquisition and Resettlement	2.0	-	0%	-	0%	-	0%	-	0%	2.0	100%
7 Implementation Consultant	15.0	-	0%	0.7	5%	14.3	95%	-	0%	-	0%
Phase 1	14.3	-	0%	-	0%	14.3	100%	-	0%	-	0%
Phase 2	0.7	-	0%	0.7	100%	-	0%	-	0%	-	0%
8 O&M Service Contract	102.0	-	0%	21.0	21%	-	0%	-	0%	81.0	79%
ADB Financed Portion	21.0	-	0%	21.0	100%	-	0%	-	0%	-	0%
Non-ADB Financed Portion	81.0	-	0%	-	0%	-	0%	-	0%	81.0	100%
9 Recurrent Costs	8.0	-	0%	-	0%	-	0%	-	0%	8.0	100%
10 Taxes and Duties	83.9	-	0%	-	0%	-	0%	-	0%	83.9	100%
Subtotal (A)	1,274.9	706.0	55%	21.7	2%	24.3	2%	125.3	10%	397.6	31%
B. Contingencies											
1 Physical	128.3	70.6	55%	2.9	2%	2.4	2%	12.5	10%	39.8	31%
2 Price	47.1	25.8	55%	2.8	6%	1.8	4%	4.1	9%	12.6	27%
Subtotal (B)	175.3	96.4	55%	5.7	3%	4.2	2%	16.6	9%	52.4	30%
C. Financing Charges During Implementation											
1 Interest	46.0	34.1	74%	2.3	5%	1.5	3%	8.1	18%	-	0%
2 Commitment Charges	3.7	-	0%	-	0%	-	0%	-	0%	-	0%
		3.4	93%	0.2	7%	-	0%	-	0%	-	0%
Subtotal (C)	49.7	37.6	76%	2.5	5%	1.5	3%	8.1	16%	-	0%
D. Total (A+B+C)	1,500.0	840.0	56%	30.0	2%	30.0	2%	150.0	10%	450.0	30.0%

¹ In mid-2013 prices.

² Includes flue gas desulfurisation retrofit for existing units at JPCL power plant.

³ Includes technical training to be provided to JPCL staff on site (simulator) and through WAPDA College training courses.

⁴ Includes 10-year contract.

⁵ Includes 5-year O&M contract with spare parts.

⁶ Includes project management unit cost for 10 years and external audit cost.

⁷ 5% of total value of imported equipment and 15% of GST to be financed by the government.

⁸ Physical contingency at 10% of base cost. Price contingency calculated based on price escalation factors.

⁹ ADB OCR loan # 1 interest rate calculated at LIBOR 5-year fixed swap rates plus 0.4% margin and 0.1% maturity premium. ADB OCR loan # 2 interest rate calculated at LIBOR 5-year fixed swap rate plus 0.4% margin. Commitment charge for both ADB OCR loans at 0.15%. ADB ADF interest rate at 2%. IDB financing rate assumed to be at LIBOR 5-year fixed swap rate plus 1.15% spread.

Source: Asian Development Bank estimates.

D. Detailed Cost Estimates by Outputs/Components (\$ million)

Item	Total Cost	Coal Fired Power Plant Component 1		Capacity Development Component 2		Environmental & Emission Control Component 3	
		Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category
A. Base Cost							
1 Construction of Supercritical Power Plant	880.0	880.0	69%	-	0%	-	0%
2 Environmental Remediation of Site	9.0	-	0%	-	0%	9.0	4%
3 Site Preparation	5.0	5.0	0%	-	0%	-	0%
4 Emission Control for the Site	160.0	-	0%	-	0%	160.0	78%
5 Capacity Development	10.0	-	0%	10.0	79%	-	0%
6 Land Acquisition and Resettlement	2.0	2.0	0%	-	0%	-	0%
7 Implementation Consultant	15.0	15.0	1%	-	0%	-	0%
8 O&M Service Contract	102.0	102.0	8%	-	0%	-	0%
9 Recurrent Costs	8.0	8.0	1%	-	0%	-	0%
10 Taxes and Duties	83.9	71.3	6%	0.7	6%	11.9	6%
Subtotal (A)	1,274.9	1,083.3	85%	10.7	85%	180.9	88%
B. Contingencies							
1 Physical	128.3	109.0	9%	1.1	8%	18.1	9%
2 Price	47.1	39.99	3%	0.40	3%	6.68	3%
Subtotal (B)	175.3	149.0	12%	1.5	12%	24.8	12%
C. Financing Charges During Implementation							
1 Interest	46.0	45.6	4%	0.5	4%	-	0%
2 Commitment Charges	3.7	3.6	0%	0.0	0%	-	0%
Subtotal (C)	49.7	49.2	4%	0.5	4%	-	0%
D. Total (A+B+C)	1,500.0	1,281.5	100%	12.7	100%	205.7	100%

¹ In mid-2013 prices.

² Includes flue gas desulfurisation retrofit for existing units at JPCL power plant.

³ Includes technical training to be provided to JPCL staff on site (simulator) and through WAPDA College training courses.

⁴ Includes 10-year contract.

⁵ Includes 5-year O&M contract with spare parts.

⁶ Includes project management unit cost for 10 years and external audit cost.

⁷ 5% of total value of imported equipment and 15% of GST to be financed by the government.

⁸ Physical contingency at 10% of base cost. Price contingency calculated based on price escalation factors.

⁹ ADB OCR loan # 1 interest rate calculated at LIBOR 5-year fixed swap rates plus 0.4% margin and 0.1% maturity premium. ADB OCR loan # 2 interest rate calculated at LIBOR 5-year fixed swap rate plus 0.4% margin. Commitment charge for both ADB OCR loans at 0.15%. ADB ADF interest rate at 2%. IDB financing rate assumed to be at LIBOR 5-year fixed swap rate plus 1.15% spread.

Source: Asian Development Bank estimates.

E. Detailed Cost Estimates by Year (\$ million)

Item	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	Cost	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
A. Base Cost											
1 Construction of Supercritical Power Plant	880.0	-	151.9	244.1	343.6	140.4	-	-	-	-	-
2 Environmental Remediation of Site	9.0	-	9.0	-	-	-	-	-	-	-	-
3 Site Preparation	5.0	-	5.0	-	-	-	-	-	-	-	-
4 Emission Control for the Site	160.0	-	64.0	64.0	32.0	-	-	-	-	-	-
5 Capacity Development	10.0	-	1.7	2.8	3.9	1.6	-	-	-	-	-
6 Land Acquisition and Resettlement	2.0	-	1.0	1.0	-	-	-	-	-	-	-
7 Implementation Consultant	15.0	0.8	3.0	4.5	4.5	1.5	0.2	0.2	0.2	0.2	0.2
8 O&M Service Contract	102.0	-	-	-	-	-	20.4	20.4	20.4	20.4	20.4
9 Recurrent Costs	8.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
10 Taxes and Duties	83.9	-	13.8	22.2	31.2	12.7	0.8	0.8	0.8	0.8	0.8
Subtotal (A)	1,274.9	1.6	250.2	339.4	416.0	157.0	22.2	22.2	22.2	22.2	22.2
B. Contingencies											
1 Physical	128.3	0.2	25.2	34.1	41.9	15.8	2.2	2.2	2.2	2.2	2.2
2 Price	47.1	-	8.1	13.1	18.4	7.5	-	-	-	-	-
Subtotal (B)	175.3	0.2	33.3	47.2	60.2	23.3	2.2	2.2	2.2	2.2	2.2
C. Financing Charges During Implementation											
1 Interest	46.0	0.05	4.2	8.9	15.1	15.4	0.4	0.5	0.5	0.5	0.5
2 Commitment Charges	3.7	1.3	1.1	0.7	0.3	0.1	0.1	0.1	0.1	0.1	-
Subtotal (C)	49.7	1.3	5.3	9.7	15.4	15.5	0.5	0.5	0.5	0.5	0.5
D. Total (A+B+C)	1,500.0	3.0	288.8	396.2	491.7	195.8	24.9	24.9	24.9	24.9	24.9

¹ In mid-2013 prices.

² Includes flue gas desulfurisation retrofit for existing units at JPCL power plant.

³ Includes technical training to be provided to JPCL staff on site (simulator) and through WAPDA College training courses.

⁴ Includes 10-year contract.

⁵ Includes 5-year O&M contract with spare parts.

⁶ Includes project management unit cost for 10 years and external audit cost.

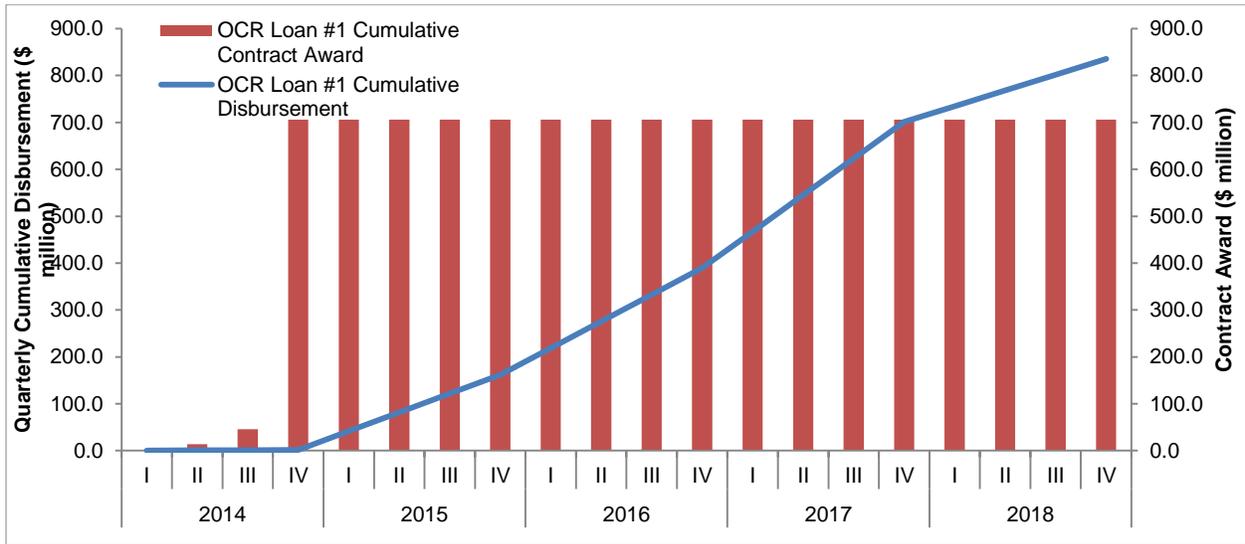
⁷ 5% of total value of imported equipment and 15% of GST to be financed by the government.

⁸ Physical contingency at 10% of base cost. Price contingency calculated based on price escalation factors.

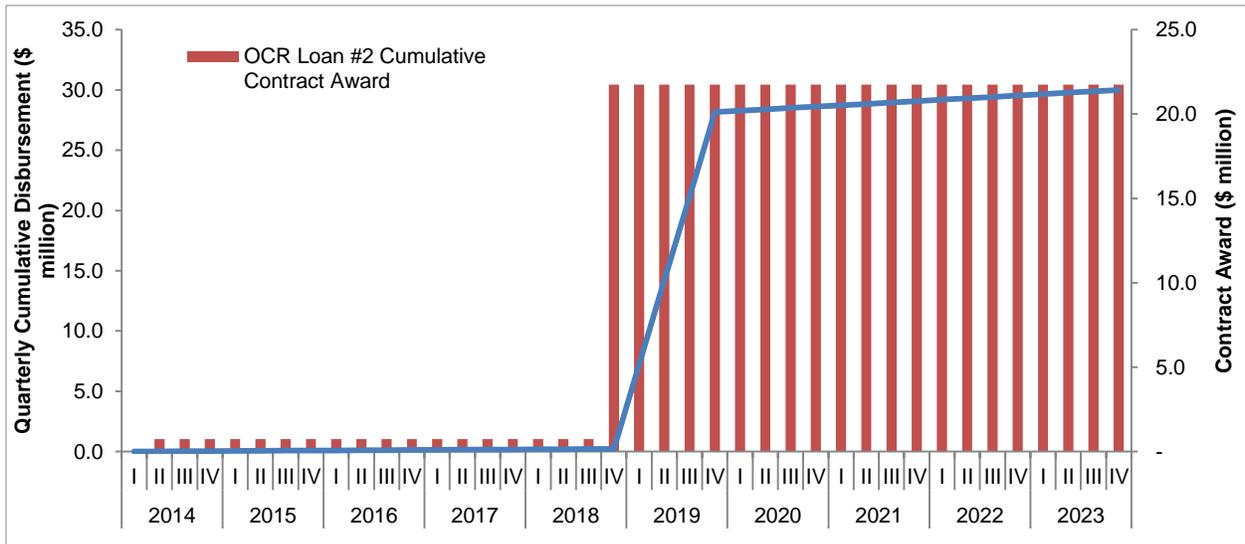
⁹ ADB OCR loan # 1 interest rate calculated at LIBOR 5-year fixed swap rates plus 0.4% margin and 0.1% maturity premium. ADB OCR loan # 2 interest rate calculated at LIBOR 5-year fixed swap rate plus 0.4% margin. Commitment charge for both ADB OCR loans at 0.15%. ADB ADF interest rate at 2%. IDB financing rate assumed to be at LIBOR 5-year fixed swap rate plus 1.15% spread.

Source: Asian Development Bank estimates.

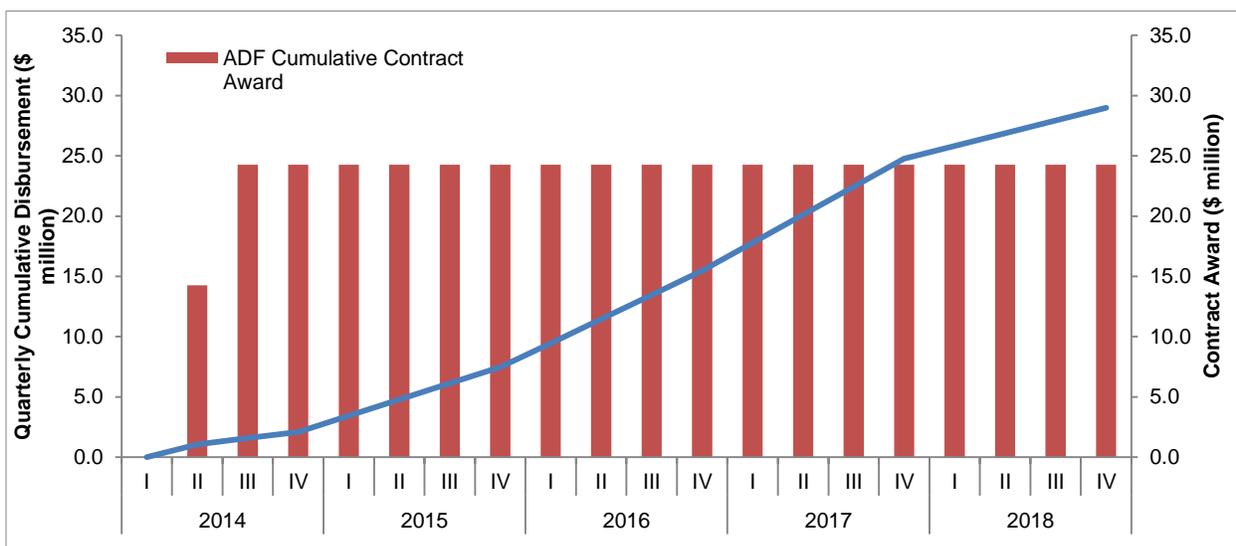
F. Contract Award and Disbursement Projections – OCR Loan #1



G. Contract Award and Disbursement Projections – OCR Loan #2



H. Contract Award and Disbursement Projections – ADF



Note: Graph includes only ADB-funded portion excluding price and physical contingencies.

Source: Asian Development Bank estimates.

I. Contract Award and Disbursement Projections (\$ million)

A. 2014–2018

	2014				2015				2016				2017				2018			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
OCR 1	1.4				160.3				227.8				311.7				134.2			
Contract award (CA)	0.0	14.0	32.0	660.0																
Cumulative CA	0.0	14.0	46.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0	706.0
Disbursement (D)	0.0	0.7	0.4	0.4	40.1	40.1	40.1	40.1	56.9	56.9	56.9	56.9	77.9	77.9	77.9	77.9	33.5	33.5	33.5	33.5
Cumulative D	0.0	0.7	1.1	1.4	41.5	81.5	121.6	161.7	218.6	275.6	332.5	389.5	467.4	545.3	623.2	701.2	734.7	768.2	801.8	835.3
OCR 2	0.0				0.0				0.0				0.0				0.0			
Contract award	0.0	0.7																		21.0
Cumulative CA	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	21.7
Disbursement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cumulative D	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ADF	2.1				5.4				8.0				9.3				4.2			
Contract award	0.0	14.3	10.0																	
Cumulative CA	0.0	14.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Disbursement	0.0	1.1	0.5	0.5	1.3	1.3	1.3	1.3	2.0	2.0	2.0	2.0	2.3	2.3	2.3	2.3	1.1	1.1	1.1	1.1
Cumulative D	0.0	1.1	1.6	2.1	3.5	4.8	6.1	7.5	9.5	11.5	13.5	15.5	17.8	20.1	22.4	24.8	25.8	26.9	27.9	29.0

Source: Asian Development Bank estimates.

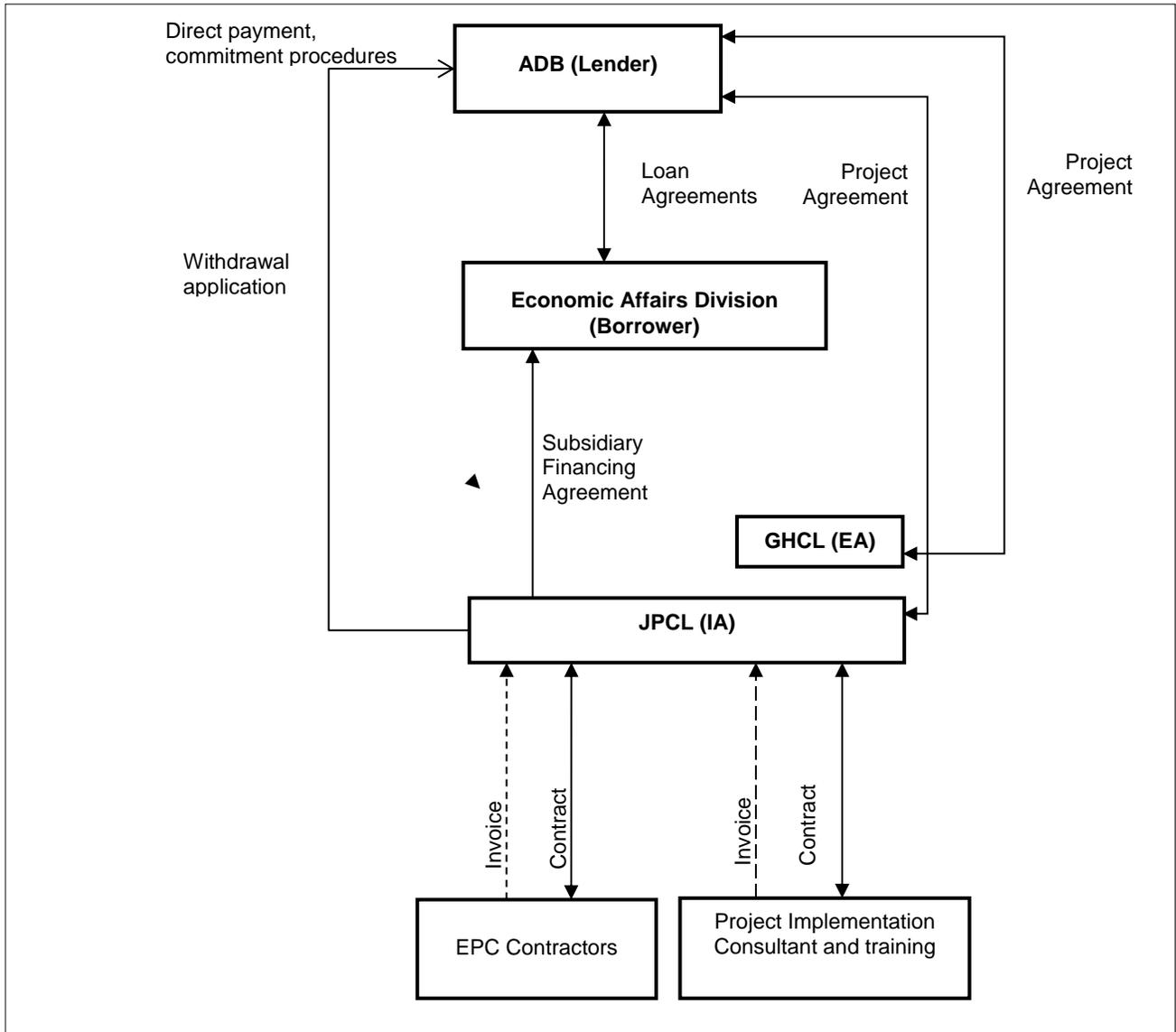
Contract Award and Disbursement Projections (\$ million)

B. 2019–2023

	2019				2020				2021				2022				2023			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
OCR 1																				
Contract award (CA)																				
Cumulative CA																				
Disbursement (D)																				
Cumulative D																				
OCR 2	27.9				0.44				0.46				0.46				0.47			
Contract award																				
Cumulative CA	21.7	22	22	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7
Disbursement	7.0	7	7	6.99	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Cumulative D	7.2	14	21	28.2	28.3	28.4	28.5	28.6	28.7	28.8	29	29.1	29.2	29.3	29.4	29.5	29.7	29.8	29.9	30
ADF																				
Contract award																				
Cumulative CA																				
Disbursement																				
Cumulative D																				

Source: Asian Development Bank estimates.

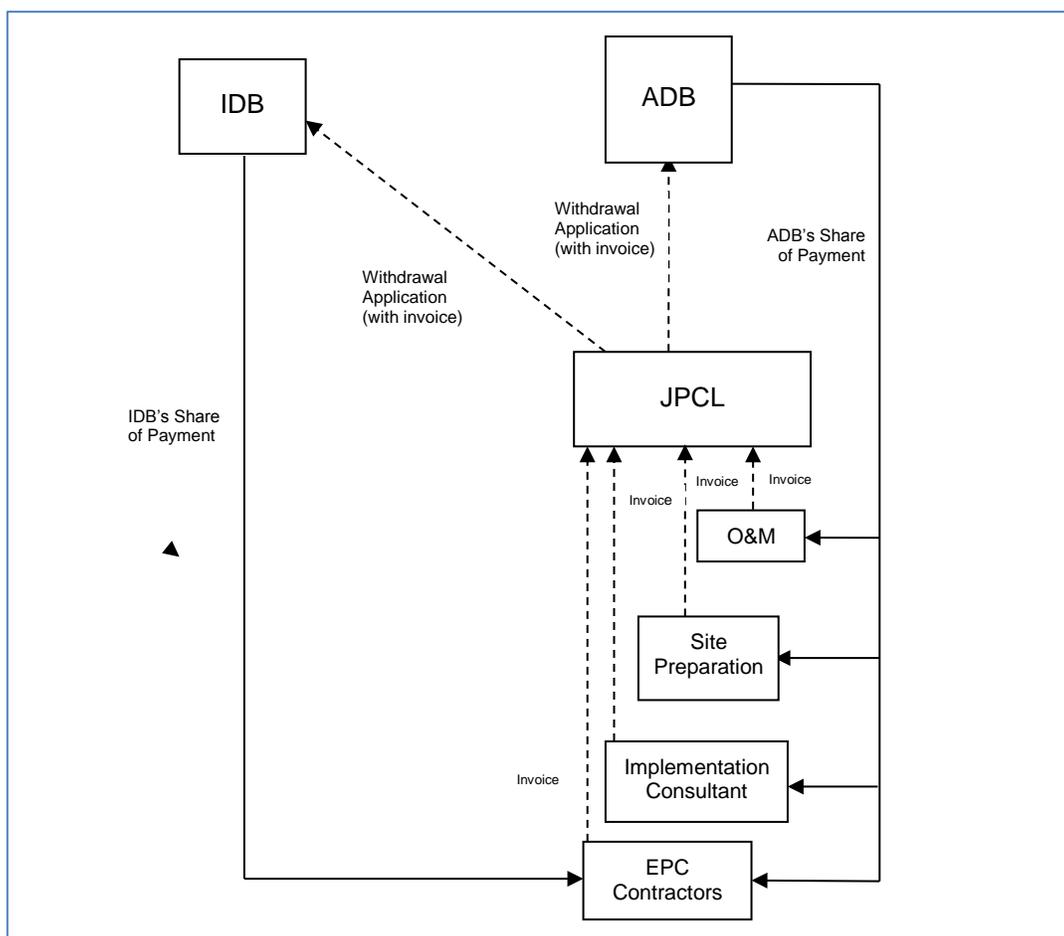
J. Fund Flow Diagram



ADB = Asian Development Bank, EA = executing agency, GHCL = GENCO Holding Company Limited, IA = implementing agency, JPCL = Jamshoro Power Company Limited, MOF = Ministry of Finance, TPS = thermal power station.

Source: Asian Development Bank.

K. Disbursement Mechanism



ADB = Asian Development Bank, EPC = engineering, procurement and construction, IDB = Islamic Development Bank, JPCL = Jamshoro Power Company Limited, O&M = operation and maintenance.

Source: Asian Development Bank.

VI. FINANCIAL MANAGEMENT

A. Financial Management Assessment

26. The financial management of JPCL is generally satisfactory especially on the accounting policies and procedures and financial reporting which are in line with International Financial Reporting Standards (IFRS) and of credible quality as the audit reports have been regularly audited and audit opinion has been unqualified. Financial management of JPCL was carried out using the ADB Financial Management Questionnaire (FMAQ). However, JPCL has not been able to operate independently and commercially as its Board of Directors has ceased functioning since 2010 even though it is a corporate entity. There is serious corporate governance issue which needs to be addressed promptly. This will be addressed through the Rehabilitation Plan which will be carried out according to the financial performance milestones. JPCL's organizational structure will be reviewed and adjusted in order to establish accountability. Financial and management reporting will be automated with the introduction of the Silicon Alley Group Enterprise Resource Planning (SAG ERP) system.

27. JPCL has accumulated a significant amount of losses which has resulted in negative cash position and net asset value. JPCL's revenue streams and cash flows are driven by tariffs collected by DISCOs and transferred through the NTDC to the GENCOs. The prime collectors of funds into the systems, the DISCOs, have been also facing with severe constraints such as a high level of bad debts, and outstanding from GOP for subsidies which mean that the entire system is cash-short at any given point in time. The quantum and timing of the cash inflow for energy supplied to NTDC dictates the manner in which payments are made, the most significant being the payments to the suppliers of fuel. As a result the JPCL is essentially financed by fuel creditors, which is not a satisfactory situation. In addition, rapidly increasing losses, primarily due to using the under cost recovery tariff and operating under optimal efficiency, have resulted in a negative equity base which means that the GENCOs are facing severe liquidity risk. JPCL requires financial rehabilitation to restore stable operating income, ensure sufficient cash flow, and reduce, if not eliminate, accumulated losses to recapitalize its balance sheet. Furthermore, if the situation does not improve, JPCL will not have sufficient cash to sustain the new investment. The financial rehabilitation road map agreed is summarized in the following table:

Rehabilitation Period
June 2013 – June 2021 with different annual milestones and thereafter with permanent annual milestones
Measures
<p>A. Tariff petition and determination</p> <ul style="list-style-type: none"> • Immediate recruitment of an international independent assessment engineer (multi-year contract) • Tariff petition and determination for both existing plants and the two new supercritical coal-fired power plants • Reassessment and revision of tariff petition and determination (as needed and annually) • Monitoring of revenue and expenditure flows (quarterly)
<p>B. Recapitalization</p> <ul style="list-style-type: none"> • Recapitalization analysis and plan (eliminate accumulated losses by 2019). • Elimination of accumulated losses will be made through capital injection by the Government of Pakistan • Profit recovery
<p>C. Corporate governance strengthening</p> <ul style="list-style-type: none"> • Organizational restructure analysis and plan • Appointment of a new Board of Directors • Establishment of an independent legal function staffed with qualified lawyer(s) • Recruitment for qualified internal audit specialists to strengthen the Internal Audit Cell at GHCL.
<p>D. Business Plan and Financial Projection</p> <ul style="list-style-type: none"> • Submission of an annual business plan with financial review and projection • Monitoring financial indicators • 3-year rolling business plan • Performance benchmark for each operational unit and position • Status update on the implementation of Silicon Alley Group Enterprise Resource Planning (SAG ERP) • Preventative O&M and cost reduction measures • Variance analysis

Monitoring Indicators

A. Restoration of stable income

- Measure: immediate tariff petition and determination
- Performance Indicator: Filing of Tariff Petition with NEPRA
- Monitoring operating indicators: [This indicator shall be linked with approval of Tariff by NEPRA]

$$\text{gross profit margin} = \frac{\text{Sales} - \text{Cost of Sales}}{\text{Sales}}$$

B. Restoration of capital adequacy

- Measure: recapitalization by profit recovery and revaluation of fixed assets
- Monitoring capital adequacy indicator:

$$\text{debt to asset ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

C. Ensuring adequate liquidity

- Measure: immediate tariff petition and determination
- Monitoring liquidity indicators:

$$\text{current ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{debt service coverage ratio} = \frac{\text{Free Cash Flow [revenues-expenses +/- extraordinary income/loss (excluding non-cash items, working capital movements and interest charges) - net capital expenditure]}}{\text{Annual Debt Service}}$$

D. Monitoring methods

- Submission of "Financial Rehabilitation Progress and Achievement Report":
Deadline: **31 December (2014-2019), annually**
- Submission of "Business Plan and Variance Report":
Deadline: **31 July (2014-2019), annually**
- Joint semi-annual reviews (JPCL - ADB):
Frequency and timing: **January and August (for 2014-2019)**

Financial Performance Milestones

Coverage Period	Milestones
2013 and 2014	Agree with NEPRA on tariff for existing plants by 31 Dec 2013.
2013 and 2014	Agree with NEPRA on tariff for the new coal-fired power plants by 31 Dec 2014. Complete organizational restructure and appointment of Board of Directors and key managers (as set out in the FMA). Submission of "Corporate Governance – Organizational Restructure Progress Report" by 31 Dec 2014.
31 Dec 2014	Develop "Annual Business Plan and Performance Report" including: <ul style="list-style-type: none"> • Financial performance review, • 3-year rolling business plan • Monitoring financial indicators • Performance benchmark for each operational unit and position (see below)

	<ul style="list-style-type: none"> • Next fiscal year's budget and proposed financing and investment activities • Status of SAG ERP roll-out and implementation • Variance analysis <p>Develop performance benchmark for each operational unit against industry standards including:</p> <ul style="list-style-type: none"> • Total/operating revenue per head • Total/operating/non-fuel operating cost per head • Plant efficiency rate (heat rate) • Total cost to income ratio • Non-fuel operating cost to income ratio <p>Submission: December 2014.</p>
For the year ended 30 June 2015 and 30 June 2016	<p>Prepare "Annual Business Plan and Performance Report" including the following additional information for the designated fiscal year(s):</p> <ul style="list-style-type: none"> • Gross profit margin = 3% (subject to the approval of NEPRA) • Current ratio = 0.3 • Debt to assets ratio = 0.8 • Debt-service coverage ratio = — • Annual business plan with financial performance review, next year's budget and financing and investing proposal <p>Provisional Submission: November 2015 and 2016 Submission: December 2015 and 2016</p>
For the year ended 30 June 2017 and 30 June 2018	<p>Prepare "Annual Business Plan and Performance Report" including the following additional information for the designated fiscal year(s):</p> <ul style="list-style-type: none"> • Gross profit margin = 5% (subject to the approval of NEPRA) • Current ratio = 0.5 • Debt to assets ratio = 0.8 • Debt-service coverage ratio = — • Annual business plan with financial performance review, next year's budget and financing and investing proposal <p>Provisional Submission: November 2016 and 2017 Submission: December 2016 and 2017</p>
For the year ended 30 June 2019 and 30 June 2020	<p>Prepare "Annual Business Plan and Performance Report" including the following additional information for the designated fiscal year(s):</p> <ul style="list-style-type: none"> • Gross profit margin = 7% (subject to the approval of NEPRA) • Current ratio = 0.7 • Debt to assets ratio = 0.7 • Debt-service coverage ratio = 1.0 • Annual business plan with financial performance review, next year's budget and financing and investing proposal <p>Provisional Submission: November 2019 and 2020 Submission: December 2019 and 2020</p>
For the year ended 30 June 2021	<p>Prepare "Annual Business Plan and Performance Report" including the following additional information for the designated fiscal year(s):</p> <ul style="list-style-type: none"> • Gross profit margin = 9% (subject to the approval of NEPRA) • Current ratio = 1.0 • Debt to assets ratio = 0.6 • Debt-service coverage ratio = 1.1 • Annual business plan with financial performance review, next year's budget and financing and investing proposal

Risk	Risk Assessment	Management Plan and/or Mitigation Measures	Expected Timing	Risk after Mitigation
		consultants. Training on ADB procedures to be provided.		
2. Financial risks	Substantial	<ul style="list-style-type: none"> • A separate project account to be kept. Asset of the project to be ring-fenced and segregated from existing operation. • ADB direct payment, commitment letters, and reimbursement procedures are to be used for the project. [No imprest account will be established.] • Training to be provided by internationally recruited consultant on managing project account and formulating operational practices in line with ADB procedures. • Financial viability of JPCL will contribute to the financial risk of the Project. A roadmap is proposed to improve JPCL's financial sustainability. 	From loan signing	Substantial/ Moderate
3. Staffing	Moderate	<ul style="list-style-type: none"> • JPCL to carry out a review of existing staff and in-house expertise to determine the appropriate staffing for the operation and maintenance of the existing units, as well as the new coal-fired power plant to be constructed under the project. • Training to be carried out by international consultants to equip staff with pertaining knowledge about the coal-fired technology. • Introduction of documented procedures and staff training will be required to retain institutional knowledge. • GHCL and JPCL to be responsible for retaining adequate staffing for the operation and the PMU and PIU. 	30 June 2014	Moderate/ Negligible
4. Accounting policies, procedures, and systems	Moderate	<ul style="list-style-type: none"> • Roll-out of the SAG ERP system to allow for automatic data collation from different operations within JPCL and generation of management reporting. • Project account to be kept separately in the system and managed by dedicated PIU accountants. 	31 December 2013 From loan signing	Moderate/ Negligible
5. Internal audit	High	<ul style="list-style-type: none"> • Qualified internal audit experts to be recruited by JPCL immediately. • The Audit and Finance Committee of JPCL's new BoD to consist members with qualification and experience in order to provide effective supervision. 	30 June 2014	Substantial
6. External audit	Negligible	<ul style="list-style-type: none"> • External audit to be carried out on the project accounts every year 	From loan signing	Negligible
7. Reporting	Substantial/	<ul style="list-style-type: none"> • A reporting system, which will have 	From loan	Moderate

Risk	Risk Assessment	Management Plan and/or Mitigation Measures	Expected Timing	Risk after Mitigation
and monitoring	Moderate	functionality for automatic generation of financial reports, will need to be established and maintained for the project. Implementation consultants will be recruited to assist the PMU and PIU in supervising the project implementation, recording project costs, preparing withdrawal applications and progress reports.	signing	
8. Information systems	Substantial/Moderate	<ul style="list-style-type: none"> SAG ERP to be fully implemented. Other information systems and processes to be enhanced to meet the demands of organization, ensure operational stability, and allow for full consolidation of management information, as well as financial data. 	31 December 2013	Moderate
Overall	Substantial/Moderate	Overall risk should be reduced if all mitigation measures are undertaken.	31 December 2014	Moderate

ADB = Asian Development Bank, BoD = Board of Directors, ERP = Enterprise Resource Planning, GHCL = GENCO Holding Company Limited, JPCL = Jamshoro Power Company Limited, PIU = project implementation unit, PMU = project management unit, SAG = Silicon Alley Group.

B. Disbursement

30. The loan proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2012, as amended from time to time),²³ and detailed arrangements agreed upon between the Government and ADB.

31. Pursuant to ADB's Safeguard Policy Statement (2009) (SPS),²⁴ ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS.

32. The Project uses direct payment and commitment letter procedures for all the contracts. For the consulting services, direct payment method will be used. Reimbursement method may be used when necessary. JPCL will prepare disbursement projections, collect supporting documents, and prepare and send withdrawal applications to ADB and IsDB. . MOF will ensure necessary funds are made available and/or in-kind contributions are made available for their respective counterpart responsibilities.

33. Before the submission of the first withdrawal application, JPCL should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the JPCL, together with the authenticated specimen signatures of each authorized person. The minimum value per withdrawal application is US\$100,000, unless otherwise approved by ADB. JPCL is to consolidate claims to meet this limit for reimbursement claims. Withdrawal applications and supporting documents will demonstrate, among other things that the goods, and/or services were produced in or from ADB members, and are eligible for ADB financing.

²³ Available at: http://www.adb.org/Documents/Handbooks/Loan_Disbursement/loan-disbursement-final.pdf

²⁴ Available at: <http://www.adb.org/Documents/Policies/Safeguards/Safeguard-Policy-Statement-June2009.pdf>

C. Accounting

34. GHCL and JPCL will cause PIU to maintain separate books and records by funding source for all expenditures incurred on the Project. The PIU will prepare consolidated project financial statements in accordance with the government's accounting laws and regulations which are consistent with international accounting principles and practices.

D. Auditing and Public Disclosure

35. GHCL and JPCL will cause the detailed consolidated project financial statements to be audited in accordance with International Standards on Auditing and with the Government's audit regulations, by an independent auditor acceptable to ADB. The audited financial statements (AFS) for the GHCL and JPCL and audited project financial statements (AFPS) will be submitted in the English language to ADB within six months of the end of the fiscal year by the GHCL.

36. The annual audit report will include an audit management letter and audit opinions which cover (i) whether the project financial statements present a true and fair view or are presented fairly, in all material respects, in accordance with the applicable financial reporting framework; (ii) whether loan and grant proceeds were used only for the purposes of the project or not; and (iii) the level of compliance for each financial covenant contained in the legal agreements for the project.

37. Compliance with financial reporting and auditing requirements will be monitored by review missions and during normal program supervision, and followed up regularly with all concerned, including the external auditor.

38. The Government, GHCL and JPCL have been made aware of ADB's policy on delayed submission, and the requirements for satisfactory and acceptable quality of the audited project financial statements.²⁵ ADB reserves the right to require a change in the auditor (in a manner consistent with the constitution of the recipient, or for additional support to be provided to the auditor, if the audits required are not conducted in a manner satisfactory to ADB, or if the audits are substantially delayed. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures.

39. Public disclosure of the project financial statements, including the audit report on the project financial statements, will be guided by ADB's Public Communications Policy (2011).²⁶

²⁵ ADB Policy on delayed submission of audited project financial statements:

- When audited project financial statements are not received by the due date, ADB will write to the executing agency advising that (i) the audit documents are overdue; and (ii) if they are not received within the next six months, requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters will not be processed.
- When audited project financial statements have not been received within 6 months after the due date, ADB will withhold processing of requests for new contract awards and disbursement such as new replenishment of imprest accounts, processing of new reimbursement, and issuance of new commitment letters. ADB will (i) inform the executing agency of ADB's actions; and (ii) advise that the loan may be suspended if the audit documents are not received within the next six months.
- When audited project financial statements have not been received within 12 months after the due date, ADB may suspend the loan.

²⁶ Available from <http://www.adb.org/documents/pcp-2011?ref=site/disclosure/publications>

After review, ADB will disclose the annual audited project financial statements and the opinion of the auditors on the project financial statements within 30 days of the date of their receipt by posting them on ADB's website. The Audit Management Letter will not be disclosed.

VII. PROCUREMENT AND CONSULTING SERVICES

A. Procurement Capacity Assessment

40. A procurement capacity assessment of GHCL and JPCL was conducted. A summary of the assessment can be found in the Supplementary Appendix.

B. Advance Contracting and Retroactive Financing

41. **Advance contracting.** All advance contracting will be undertaken in conformity with ADB's Procurement Guidelines (2013, as amended from time to time)²⁷ and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time)²⁸. The issuance of invitations to bid under advance contracting will be subject to ADB approval. The Borrower, GHCL and JPCL have been advised that approval of advance contracting does not commit ADB to finance the Project. Advance contracting is expected for the recruitment of project implementation consultants. Advertisement, shortlisting, issuance of requests for proposals, technical and financial evaluations may take place prior to effectiveness of the loan agreements.

42. **Retroactive financing.** The project envisages advance contracting and retroactive financing of up to 20% of total financing for project implementation consultant services, as per the Project Concept Paper approved by ADB Management.

C. Procurement of Goods, Works and Consulting Services

43. All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines (2013, as amended from time to time).

44. **EPC Contracts.** JPCL will select the most appropriate contract form with ADB prior concurrence, however, two-stage, single envelope bidding procedure without prequalification is preferred for the procurement of (i) Construction of one new supercritical coal-fired unit with 5-year O&M service contract, (ii) Environmental mitigation and (iii) Construction of FGD for existing units. The procurement will follow international competitive bidding (ICB) procedures.

45. An 18-month procurement plan indicating threshold and review procedures, goods, works, and consulting service contract packages, is in Section D.

46. **Project Implementation Consultants.** All consultants will be recruited according to ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).²⁹ Quality- and cost-based selection (QCBS) method will be the default method for recruiting consulting firms with a standard quality: cost ratio of 90:10 due to its complexity and high impact of the project. Up to 817 person-months (PM) comprising of 337-PM international and 480-PM national consulting services are required to: (i) review conceptual design and bidding documents; (ii) assist in the recruitment of engineering contractors in accordance to ADB's Procurement Guidelines (2013, as amended from time to time); (iii) develop and implement comprehensive project management plans to ensure the most efficient, timely, and economical implementation of the Project; (iv) undertake due diligence in relation to proposed consultants, subconsultants, contractors and subcontractors during procurement processes and if proposed to be included in

²⁷ Available at: <http://www.adb.org/sites/default/files/pub/2013/Guidelines-Procurement.pdf>

²⁸ Available at: <http://www.adb.org/Documents/Guidelines/Consulting/Guidelines-Consultants.pdf>

²⁹ Checklists for actions required to contract consultants by method available in e-Handbook on Project Implementation at: <http://www.adb.org/documents/handbooks/project-implementation/>

contracts after contract award; (v) ensure non-objection by ADB for any subcontracting structures in excess of 10% proposed to be included in consulting or construction contracts; and (vi) supervise the engineering contractors for supply, installation, commissioning and testing of equipment. Estimated contract duration is 60 months. The terms of reference for consulting services are detailed in Section F. ADB ADF loan proceeds will cover the cost of the project implementation and supervision consultant.

47. **Capacity Development.** GHCL and JPCL will need to develop its capacity for future coal project expansion. The activities will be financed through ADB's ADF loan proceeds.

D. Procurement Plan

A. Basic Data

Project Name: PAK: Jamshoro Power Generation Project

Country: Pakistan

Executing Agency:

GENCO Holding Company Limited (GHCL)
118 WAPDA House, Lahore, Pakistan

Implementation Agency:

Jamshoro Power Company Limited (JPCL),
Mohra Jabal Dadu Road, Jamshoro, Sindh,
Pakistan

Loan Amount: \$900 million (\$30 million ADF; \$870 million OCR in two separate loans amounting \$840 million and \$30 million respectively)

Loan Numbers: [TBD] (OCR Loan 1), [TBD] (OCR Loan 2), [TBD] (ADF)

Date of First Procurement Plan: June 2013

Date of this Procurement Plan: September 2013

48. The project envisages advance contracting and retroactive financing of up to 20% of total financing, as per the Project Concept Paper approved by ADB Management.

B. Process Thresholds, Review and 18-Month Procurement Plan

49. Except as ADB may otherwise agree, the following process thresholds shall apply to procurement of goods and works.

Procurement of Goods and Works

Method	Threshold
International Competitive Bidding (ICB) for Works	\$5,000,000 and above
National Competitive Bidding (NCB) for Works	Between \$100,000 and \$5,000,000
ICB for Goods	\$1,000,000 and above
NCB for Goods	Between \$100,000 and \$1,000,000

1. ADB Prior or Post Review

50. Except as ADB may otherwise agree, the following prior or post review requirements apply to the various procurement and consultant recruitment methods used for the project.

Procurement Method	Prior or Post	Comments
Procurement of Goods and Works		
ICB Works	Prior	Yes
ICB Goods	Prior	Yes
Recruitment of Consulting Firms		
Quality- and Cost-Based Selection (QCBS)	Prior	Yes
Recruitment of Individual Consultants		
Individual Consultants (ICS)	Prior	Yes

2. Goods and Works Contracts Estimated to Cost More Than \$1 Million

51. The following table lists goods and works contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value	Procurement Method	Prequalification of Bidders (y/n)	Advertisement Date (quarter/year)	Comments
Procurement of EPC Contract for Construction of one Supercritical Coal-fired Unit with 5-year O&M	\$982 million	ICB	N	1st quarter 2014	Financed by ADB, IsDB and GOP
Procurement of EPC Contract for FGD for Existing Units	\$160 million	ICB	N	1st quarter 2014	Financed by ADB and GOP
Procurement of EPC Contract for Site Remediation	\$9 million	ICB	N	1st quarter of 2014	Financed by ADB and GOP
Procurement of Work for the site preparation	\$5 million	NCB	N	4th quarter 2013	Financed by ADB and GOP

3. Consulting Services Contracts Estimated to Cost More Than \$100,000

52. The following table lists consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value	Recruitment Method	Advertisement Date (quarter/year)	International or National Assignment	Comments
Project Implementation Consultant	\$15 million	QCBS (QC Ratio: 90:10)	2nd Quarter 2013	International	Financed by ADB
Capacity Development Component	\$10 million	QCBS (QC Ratio: 90:10)	1st Quarter 2014	International	Financed by ADB

4. Consulting Services Contracts Estimated to Cost Less Than \$100,000

53. There are no smaller-value consulting service contracts envisaged in this project.

5. ADB Review of Contract Modification

54. ADB will review contract modifications in accordance with the procedures set forth in the financing agreement between the Beneficiary and ADB.

6. Indicative List of Packages Required Under the Project

55. The following table provides an indicative list of all procurement (Goods, Works and Consulting services) over the life of the Project. Contracts financed by the Borrower and others should also be indicated, with an appropriate notation in the comments section.

General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Procurement Method	Domestic Preference Applicable ¹	Comments
A. Procurement of EPC Contract for Construction of one Supercritical Coal-fired Unit with 5-year O&M	\$982 million	1	ICB	No	Financed by ADB, and GOP
B. Procurement of EPC Contract for Construction of FGD for Existing Units	\$160 million	1	ICB	No	Financed by ADB and GOP
C. Procurement of Turnkey Contract for Site remediation of the site	\$9 million	1	ICB	No	Financed by ADB and GOP
D. Procurement of Work for site preparation	\$5 million	1	NCB	No	Financed by ADB and GOP
Consulting Services					
General Description	Estimated Value (cumulative)	Estimated Number of Contracts	Recruitment Method ²	Type of Proposal ³	Comments
A. Project implementation consultant	\$15 million	1	International	FTP	Financed by ADB
B. Capacity Development Component	\$10 million	1	International	FTP	Financed by ADB

ADB = Asian Development Bank; BTP = bio-data technical proposal; CQS = consultants' qualification selection; FTP = full technical proposal; QCBS = quality- and cost-based selection; HFO = heavy fuel oil; TPS = thermal power station
 Notes: ¹ See *Procurement Guidelines, Appendix 2*

² Indicate recruitment method and whether it is for international or national assignment

³ See PAI 2.02G: full, simplified or bio-data proposal

E. National Competitive Bidding

1. General

56. The procedures to be followed for national competitive bidding shall be those set forth in the Public Procurement Rules 2004 [S. R. O. 432 (1)/2004] issued on the 9th June 2004 by the Public Procurement Regulatory Authority Ordinance 2002 (XXII of 2002) of the Islamic Republic of Pakistan with the clarifications and modifications described in the following paragraphs required for compliance with the provisions of the ADB's Procurement Guidelines (2013, as amended from time to time).

2. Registration

57. Bidding shall not be restricted to pre-registered firms and such registration shall not be a condition for participation in the bidding process.

58. Where registration is required prior to award of contract, bidders: (i) shall be allowed a reasonable time to complete the registration process; and (ii) shall not be denied registration for reasons unrelated to their capability and resources to successfully perform the contract, which shall be verified through post-qualification.

3. Prequalification

59. Normally, post-qualification shall be used unless prequalification is explicitly provided for in the loan agreement/procurement plan. Irrespective of whether post qualification or prequalification is used, eligible bidders (both national and foreign) shall be allowed to participate.

4. Bidding Period

60. The minimum bidding period is twenty-eight (28) days prior to the deadline for the submission of bids.

5. Bidding Documents

61. Procuring entities shall use the applicable standard bidding documents for the procurement of goods, works and services acceptable to ADB.

6. Preferences

62. Domestic preference shall be given for domestic bidders and for domestically manufactured goods.

7. Advertising

63. Invitations to bid shall be advertised in at least one widely circulated national daily newspaper or freely accessible, nationally-known website allowing a minimum of twenty-eight (28) days for the preparation and submission of bids. NCB contracts estimated to cost \$500,000 or more for goods and related services and & \$1,000,000 or more for civil works will be advertised on ADB's website via the posting of the Procurement Plan.

8. Bid Security

64. Where required, bid security shall be in the form of a bank guarantee from a reputable bank.

9. Bid Opening and Bid Evaluation

65. Bids shall be opened in public.

66. Evaluation of bids shall be made in strict adherence to the criteria declared in the bidding documents and contracts shall be awarded to the lowest evaluated bidder.

67. Bidders shall not be eliminated from detailed evaluation on the basis of minor, non-substantial deviations.

68. No bidder shall be rejected on the basis of a comparison with the employer's estimate and budget ceiling without the ADB's prior concurrence.

69. A contract shall be awarded to the technically responsive bid that offers the lowest evaluated price and no negotiations shall be permitted.

10. Rejection of all Bids and Rebidding

70. Bids shall not be rejected and new bids solicited without the ADB's prior concurrence.

11. Participation by Government-owned enterprises

71. Government-owned enterprises in the Islamic Republic of Pakistan shall be eligible to participate as bidders only if they can establish that they are legally and financially autonomous, operate under commercial law and are not a dependent agency of the contracting authority. Furthermore, they will be subject to the same bid and performance security requirements as other bidders.

12. ADB Member Country Restrictions

72. Bidders must be nationals of member countries of ADB, and offered goods and services must be produced in and supplied from member countries of ADB.

F. Term of Reference of Project Implementation Consultant

A. Background

73. Pakistan faces energy shortage that decreases industrial productivity and adversely affects the social welfare of the people. To sustain economic growth and make it more inclusive, a reliable supply of electricity is essential, as electricity is central to almost every aspect of the country's sustainable socioeconomic development. Uninterrupted supply of electricity supports commerce and business, maintains and attracts industrial activities for job creation, and enhances people's well-being. Energy efficiency and diversification of energy mix away from imported heavy fuel oil (HFO) to cheaper coal are, for Pakistan, the faster and cheaper ways to increase electricity supply and to decrease generation cost.

74. The Jamshoro Power Generation Project (JPGP) will increase reliable power generation and reduce power shortage through construction of one new supercritical coal-fired power unit in Jamshoro Thermal Power Station (TPS). This will provide the power needed to help address the country's power shortage and improve reliability and enhance energy security by diversifying the fuel mix.

75. GENCO Holding Company Limited (GHCL) intends to procure EPC turnkey contractors to build the supercritical coal-fired power unit. The contractors will be responsible for design, supply, delivery, erection, testing, commissioning of the new unit. The contractor is scheduled to be mobilized in the first quarter of 2015. The proposed implementation consulting firm will be recruited to assist GHCL in reviewing bidding documents and tender evaluation for the new

supercritical unit, supervising and monitoring the implementation progress of the project. GHCL and Jamshoro Power Company Limited (JPCL) will assist the consultants in the onsite coordination and data gathering. GHCL and JPCL will also provide all necessary assistance to the consultants in liaising with other government ministries and agencies.

76. GHCL and JPCL will provide and make available to the consultants, free of charge, the following facilities, services, equipment, materials, documents and information as required by the consultants for carrying out the assignment:

- (i) Counterpart staff/technical support;
- (ii) Office space: sufficient office space for the consultant team, with national and international telephone lines, electricity and air conditioning/heating, and internet connections;
- (iii) Office furniture: desks, office chairs, and bookshelves/cabinets adequate to accommodate the full complement of international and local consultants; and
- (iv) Organizational support: assistance in all arrangements for workshops, meetings, and field visits; and access to required available data, maps and other relevant information.

77. The consultants will be responsible for their personal computers and other facilities not mentioned above for producing relevant reports.

B. Objective of the Assignment

78. The implementation of the Project will require the service of a multidisciplinary team of consultants. An international consulting firm (the Firm) with international and national experts experienced in the development of power plants is required to supervise the construction work of the two new supercritical coal-fired power units and to provide assistance on procurement.

C. Scope of Work

79. The Firm will assist GHCL Project Management Unit (PMU) in conducting international competitive bidding for selection of engineering, procurement and construction contractor. The Firm will prepare, not limited to the necessary project plans, progress reports, payment certificates, provisional and final take over certificates, claims evaluation reports, project final report and any other project management documents as required in accordance with good practice and GHCL and ADB requirements.

80. The services to be provided by the Firm include but are not limited to, the following:

- (i) Review and recommend the proposed technical design of the supercritical coal fired power unit;
- (ii) Reconfirm the technical specification, and if it has deficiency, update it;
- (iii) Gather primary data on climate condition and process the data to produce the required climate condition for the final design;
- (iv) Assist in tendering procedures which includes clarification, pre-bidding meeting and issue an addendum as required;
- (v) Review bidding documents and evaluating bids including preparing Bid Evaluation Report (BER) in accordance with ADB's Procurement Guidelines (2013, as amended from time to time);

- (vi) Provide trainings and capacity development for procurement, new technology management, operation and maintenance of coal fired power unit and safeguards capacity in JPCL and GHCL;
- (vii) Compare as-built drawings to the design;
- (viii) Develop and implement a construction quality assurance program;
- (ix) Monitor implementation progress and identify what actions and resources are required to address the EPC needs to achieve the schedule and how the proposed project could be best implemented;
- (x) Inspect materials before shipment, upon arrival and upon erection;
- (xi) Review the contractor's test procedures for compliance with manufacturers' requirements and design criteria. The consultant will witness selected tests and review the test results and submit a report;
- (xii) Undertake due diligence reviews for all proposed amendments and changes in subcontracting arrangements proposed by the contractor to ensure that both the qualification and eligibility criteria as used in the evaluative process are satisfied;
- (xiii) Ensure that due diligence is conducted on potential contractors and subcontractors;
- (xiv) Update the EIA based on the detailed design and update, and formulate a site-specific EMP;
- (xv) Oversee the construction of the emission control devices for the existing units;
- (xvi) Monitor the implementation of the environmental remediation of the site;
- (xvii) Monitor safeguards and environmental management plan (EMP) implementation and provide early warning of any potential safeguard risks;
- (xviii) Verify contractor's work and issue certification of payment to the contractor;
- (xix) Prepare quarterly payment reports, ensure claim management, manage project account and analyze the causes of delay, if any;
- (xx) Prepare the protocol for handover of the unit to JPCL after the 5-year O&M contract period, which shall include efficiency tests, performance records, manuals and drawings, and verification of inventory;
- (xxi) Assist the EPC contractor and JPCL in commissioning activities; and
- (xxii) Provide additional services as reasonably requested by GHCL and JPCL to complete the Project.

D. Qualification of the Firm

81. The Firm should have demonstrated experience in (i) Consulting engineering services involving preparation of bidding documents and tender evaluation; (ii) design and construction supervisory work, on at least three supercritical coal-fired power units with capacity equivalent or above 600 MW in the last 15 years. The Firm shall have international consultants with expertise in supercritical coal-fired power plant design, development and operation, electrical/control and instrumentation of power plant, project management and implementation, bidding document preparation, procurement evaluation and institutional analyses. The Firm shall have experience in developing countries in the region. Previous experience in Pakistan is preferred. The assignment will be undertaken over a five-year period until the commissioning of the two new units; except the Operations and Maintenance (O&M) Engineer who will continue to work until the O&M support expires. For all international positions, English language skills are compulsory. For all national positions, English language skills are desirable and Urdu language skills are compulsory.

E. International Consultants – Qualification and Detailed Tasks

82. **Team Leader/Power Plant Engineer.** The Team Leader shall have a bachelors or higher degree in engineering and has at least 5 year experience of leading a team. The consultant should have at least 20 years of professional experience in the design and management of major power plant projects, at least 10 years of which was on supercritical/ultra-supercritical coal-fired projects. The consultant should have previous experience in procurement, engineering, business administration; knowledge of international organizations/agencies; donor-funded projects particularly by ADB, and disbursement and monitoring procedures. Several years of experience in project implementation of supercritical coal-fired power plants would be preferred. The consultant will manage the team, serving as lead consultant and Power Plant Engineer all at the same time. Previous experience in developing countries in the region is desirable. The Team Leader/Power Plant Engineer will undertake the following tasks:

- (i) Coordinate with other members the development of a detailed work plan and implementation schedule;
- (ii) Review and prepare project scope, capital and operating cost estimates, implementation schedule, contracting, and implementation arrangements;
- (iii) Ensure quality reports are delivered on time;
- (iv) Review and confirm the proposed technical design and configuration of the coal-fired power plant prepared by the project preparatory consultant;
- (v) Assist procurement specialists and GHCL in reviewing the bidding document especially on technical related matters, evaluation of bid and preparation of BER;
- (vi) Review and confirm the proposed technical design of the supercritical coal-fired power unit and ensure contractor's designs and works are executed following project requirement;
- (vii) Supervise and monitor project implementation;
- (viii) Develop and maintain project safety and project quality assurance plans and ensure compliance with these plans;
- (ix) Certify As-Built drawings and progress payments;
- (x) Prepare quarterly payment reports and analyze causes of delay, if any, and propose remedial measures as necessary; and
- (xi) Act as a focal person to coordinate with GHCL & ADB on all technical & contractual issues related to assignment.

83. **Deputy Team Leader/Mechanical Engineer.** The qualified engineer shall have a bachelors or higher degree in engineering. The Engineer should have previous experience in the design and management of major power plant projects including procurement, detailed engineering, and in projects financed by international financial organization, especially associated knowledge of ADB financed project. The consultant shall have at least 15 years of experience on subcritical and supercritical/ultra-supercritical coal-fired technology which shall include at least one supercritical coal-fired power plant project with capacity of 600 MW or plus. Experience in project implementation of supercritical coal-fired power plants is desirable. Previous experience in developing countries in the region is desirable. In the event that the team leader is unavailable, act as a team leader. The Mechanical Engineer will undertake the following tasks:

- (i) Coordinate with other team members to develop a detailed work plan and implementation schedule;
- (ii) Review and prepare the scope, capital and operating cost estimates, implementation schedule, contracting, and implementation arrangements;
- (iii) Ensure quality reports are delivered on time;

- (iv) Review and confirm the proposed technical design and configuration of the coal-fired power plant prepared by the project preparatory consultant;
- (v) Assist procurement specialists and GHCL in reviewing the bidding document especially on technical related matters, evaluation of bid and preparation of BER;
- (vi) Review and confirm the proposed technical design and configuration of the and ensure contractor's designs and works are executed following project requirement;
- (vii) Supervise and monitor the project implementation;
- (viii) Develop and maintain a project safety and project quality assurance plans and ensure compliance with these plans;
- (ix) Certify As-Built drawings and progress payments; and
- (x) Prepare quarterly payment reports and analyze causes of delay, if any, and propose remedial measures as necessary.

84. **Procurement Specialist.** The specialist shall have a bachelor or higher degree in engineering and at least 15 years of relevant experience in procurement roles of major power plant projects. The specialist shall have advance knowledge of international organizations/agencies and national public procurement regulations and procedures, especially associated knowledge of ADB procurement. The specialist should also have previous work experience in procurements and should have worked on projects financed by the international financial organization, especially ADB funded projects. Direct experience of public sector procurement (legislation, institutional framework, systems and training) are added advantages. Previous experience in developing countries in the region is desirable. The specialist will undertake the following tasks:

- (i) Assist GHCL and JPCL in developing procurement capacity.
- (ii) Prepare procurement capacity development plan and procurement capacity assessment report for GHCL and JPCL;
- (iii) Assist GHCL and JPCL in creating procurement committee, evaluating bid and preparing BER, and in monitoring and evaluating procurement progress, procedures compliance and BER preparation;
- (iv) Ensure that due diligence is conducted on potential contractors and subcontractors;
- (v) Ensure adherence to project safety and quality assurance plans; and
- (vi) Update procurement status databases on procurement processes and contract awards.

85. **Electrical Engineer.** The Engineer shall have a bachelor or higher degree in electrical engineering and at least 15 years of professional experience in applying design and application of electrical system for power plants. Previous experience in developing countries in the region is desirable. The Engineer will undertake the following tasks:

- (i) Coordinate with other team members and help team leader/deputy team leader develop a detailed work plan and implementation schedule;
- (ii) Assist team leader/deputy team leader and procurement specialists in the evaluation of bids and preparation of BER related to electrical equipment and electrical wiring;
- (iii) Assist team leader/deputy team leader for electrical components in design reviews;
- (iv) Supervise and monitor the project implementation with electrical equipment and electrical wiring,
- (v) Work with the Commissioning Engineer on the inspection and testing plan and accompany the Commissioning Engineer to test the electrical equipment; and

- (vi) Ensure adherence to project safety and quality assurance plans.

86. **Control & Instrumentation Engineer.** The Engineer shall have a bachelor or higher degree in engineering and at least 15 years of professional experience in applying design and application of control & instrumentation system for power plants. Previous experience in developing countries in the region is desirable. The Engineer will undertake the following tasks:

- (i) Coordinate with other team members and help team leader develop a detailed work plan and implementation schedule;
- (ii) Assist team leader/deputy team leader and procurement specialists in the evaluation of bids and preparation of BERs related to control & instrumentation equipment;
- (iii) Assist team leader/deputy team leader for control & instrumentation components in design reviews;
- (iv) Supervise and monitor the project implementation with control & instrumentation related equipment,
- (v) Work with the Commissioning Engineer on the inspection and testing plan and accompany the Commissioning Engineer to test the control & instrumentation equipment; and
- (vi) Ensure adherence to project safety and quality assurance plans.

87. **Civil Engineer.** The Engineer should have a bachelor or higher degree in civil engineering and at least 15 years of professional experience in design of power plants which shall include at least two supercritical coal-fired power plants with at least 600MW capacity. Previous experience in developing countries in the region is desirable. The Engineer will undertake the following:

- (i) Coordinate with other team members and help team leader/deputy team leader develop a detailed work plan and implementation schedule;
- (ii) Assist team leader/deputy team leader and procurement specialists in the evaluation of bids and preparation of BERs related to civil work;
- (iii) Assist the team in civil design reviews including but not limited to foundations and structures;
- (iv) Supervise and monitor civil works of the Project; and
- (v) Ensure adherence to project safety plan and quality assurance plan.

88. **Operation & Maintenance (O&M) Engineer.** The Engineer should have a bachelor or higher degree in engineering and at least 15 years of professional experience in O&M of coal-fired power plant and at least 5 years of experience in O&M of supercritical coal-fired plants. Previous experience in developing countries in the region is desirable. The Engineer will assess GENCOs' capacity in coal-fired O&M and recommend capacity building measures as appropriate. The Engineer will also advise maintenance and spares holding strategy. The Engineer will undertake the following:

- (i) Assess GENCO coal-fired power plant O&M capacity and skills level and recommend necessary institutional and capacity building measures to meet the supercritical coal-fired power plant needs and in view of future converted subcritical coal-fired plants. Capacity building options to be considered shall include (a) specialist training by the coal-fired equipment suppliers and electrical control suppliers, (b) need for contractor's specialist staff to provide on the ground and/or remote advisory services, and (c) non-equipment specific O&M training to be provided in GENCO;

- (ii) Based on actual market, geographic conditions and power plant strategy, recommend appropriate O&M activities to be carried out by GENCO staff and if any activities should be outsourced;
- (iii) Propose a spares holding strategy;
- (iv) Identify various maintenance options and recommend the most optimal approach;
- (v) Advise on procurement options for training services. Where appropriate, include such scope in the Bidding Documents for the construction contract;
- (vi) Provide trainings, workshops and seminars for the operational personnel to build O&M capacity and ensure smooth plant operation;
- (vii) Ensure training of client counterpart staff through on-the-job training and classroom training programs;
- (viii) Ensure adequacy of O&M manuals; and
- (ix) Oversee the operation support provided by the EPC contractor and ensure the claimed benefits/outputs can be achieved.

89. **Environmental Specialist.** The Environmental Specialist should have a bachelor or higher degree in environmental engineering/science or equivalent and at least 15 years of professional experience in carrying out environmental studies of infrastructure projects and ensuring their delivery. Experience in power plant related projects would be desirable. Previous experience in developing countries in the region is desirable. The specialist will assist in the following tasks:

- (i) Recommend monitoring plans to address identified significant environmental impacts;
- (ii) Ensure that the cost of implementing mitigation measures for identified environmental management and monitoring plans, and any strengthening measures, are included in the proposed Project's cost;
- (iii) Monitor safeguards and EMP implementation to ensure the safeguards and EMP are properly implemented;
- (iv) Ensure the environmental safeguard compliance during construction of the new supercritical unit, installation of emission control devices and remediation of the site;
- (v) Prepare the updated EIA report and summary EIA (SEIA) which meets both the GOP's requirements and ADB's Safeguard Policy Statement (2009); and
- (vi) Assist GENCO with capacity building on environmental safeguard.

90. **Commissioning Engineer.** The Commissioning Engineer should have a bachelor or higher degree in mechanical engineering with at least 15 years of professional experience in commissioning of different kind of power plants including subcritical and supercritical/ultra-supercritical coal-fired plants. The Engineer should have commissioned at least 3-projects in the last five years having similar capacity and complexity. The Engineer will undertake the following tasks:

- (i) Coordinate and finalize all commissioning schedules with the EPC contractor;
- (ii) Develop an inspection and testing plan covering factory and site tests;
- (iii) Review and approve all final commissioning procedure/methodology in line with relevant International standards;
- (iv) Supervise testing and commissioning as required;
- (v) Inspect and verify calibrations/certifications of the testing equipment as per relevant standards;
- (vi) Monitor and verify all guaranteed values as per contract terms;
- (vii) Ensure adherence to project safety and quality assurance plans;

- (viii) Prepare the impact reports and remedies in case of any test failures; and
- (ix) Prepare report for the client to issue final acceptance certificate.

91. **Legal Adviser.** The Legal Adviser should possess a Law degree in a reputable institution and have at least 10 years of work experience as contract lawyer. The Legal Adviser should have thorough knowledge of licence applications and regulatory principles relating to contractual agreements with suppliers, pricing and electricity tariffs, and experience of establishing/assisting new entities/companies within the energy sector. The Legal Adviser shall also have the ability to effectively communicate complex legal issues and negotiation procedures to high-level audiences including Government Ministers and Directors. Excellent writing and presentation skills are required.

92. The Legal Adviser will be responsible for providing advice on a wide range of legal issues relating to the proposed coal-fired power unit. The Legal Adviser will prepare contracts and assist in contract negotiations. The Legal Adviser will be responsible, but not limited, for the following:

- (i) Provides expert legal and advisory services to legal issues that may arise during project implementation;
- (ii) Provides legal support, advice and draft standard legal documentation required for the power plants' business transactions, including but not limited to, "Coal supply agreement", "Ash recycling agreement" and "Coal transportation agreement" that conform to best practice in the coal sub-sector and exclusively protect GHCL and JPCL's interests.
- (iii) Assist GHCL and JPGL in all contract negotiations including but not limited to, the turnkey contract, coal supply contract, ash recycling contract and coal transportation contract.
- (iv) Verify and ascertain the business value of all contracts and advise management accordingly and timeously;
- (v) Investigates legal framework for finalization of bankable contracts and agreements.
- (vi) Contracts Management of all appointed consultants.
- (vii) Manage the land transfer process.
- (viii) Interacts with MOWP, NEPRA, suppliers, and contractors on all legal matters pertaining to the power plants.
- (ix) Proactively identifies and advises management on legal risks, and propose and implement mitigation strategies
- (x) Scrutinizes and reviews all relevant government legislation relating to the coal subsector, energy sector and advise management on their impact to the operation of the power plants; and
- (xi) Perform any other legal related tasks assigned from time to time.

93. **Tariff Specialist.** The Tariff Specialist shall hold a Bachelor or higher degree in economics, finance or accounting. The Tariff Specialist will have at least 10 years working experience preferably in the energy sector, including at least 3 years of proven experience advising on electricity tariff regulation and conducting detailed tariff analysis in a non-developed country context. The Tariff Specialist should have excellent understanding of tariff-setting mechanisms for coal-fired power generation. Previous experience in developing countries in the region is desirable. Fluency in English is essential.

94. The Tariff Specialist will assist JPCL in their tariff application to:

- (i) Review the existing tariff submissions;
- (ii) Provide on-the-job training to JPCL staff; to draft the tariff petition and submit to NEPRA
- (iii) Draft Standard Operating Procedures for preparing tariff petitions and train JPCL staff. Hold training workshops for staff in companies held by GHCL.

95. **Ash Recycling Marketing Expert.** The Ash Recycling Marketing Expert shall hold a MBA or equivalent degree with experience in cement industry and shall demonstrate networking skills and linkages with the cement industry or other relevant industries in Sindh/Pakistan. The Ash Recycling Marketing Expert should have good understanding of ash recycling plan for coal-fired power generation and should be a marketing expert. Previous experience in developing countries in the region is desirable. Fluency in English is essential. The Ash Recycling Marketing Expert will undertake, but not limited, to the following:

- (i) Prepare an action plan in discussion with GHCL, JPCL and ADB, which shall be approved by JPCL and ADB before implementation;
- (ii) Assist GHCL and JPCL by liaising with the All Pakistan Cement Manufacturers' Association (APCMA) and facilitate the signing of a Memorandum of Understanding (MoU) between JPCL and selected cement manufacturers within a 100 km radius of the Jamshoro TPS on recycling ash for mixing in Ordinary Portland Cement (OPC) or in Blended Cement as prescribed by international and national guidelines. The signing of the MoU should be facilitated within one year of effectiveness of the loan;
- (iii) Facilitate the signing of a pre-agreement between selected cement companies and JPCL through advocacy and confidence building measures by 2016. The Pre-agreement shall state the details of the ash and the specification of this product and the likely uses and quantities that will be available for each of the selected users. The pre-agreement will have all details and will be a commitment in all respects other than the terms and conditions for transfer of ash and any monetary aspects;
- (iv) Advise GHCL/JPCL If no such agreement is signed and initiate the purchase of additional land for ash pond;
- (v) Work with JPCL and the selected cement companies to finalize the agreement by 2018;
- (vi) Work with the Legal Advisor on drafting individual contracts between JPCL and each cement company and ensure the signing of the contracts.

96. **Climate Change Specialist.**

F. National Consultants (Twelve)

97. Ten National Consultants shall be hired comprising two Resident Mechanical Engineers, two Procurement specialists, one Resident Electrical Engineer, one Resident Control & Instrumentation Engineer, one Resident Civil Engineer, one Environmental and Waste Management Specialist, one Resident Commissioning Engineer and three Technical Support Staff. The duties of the national consultants are to assist the International Power Plant Engineer, the International Mechanical Engineer, the International Procurement Specialist, the International Electrical Engineer, the International Control & Instrumentation Engineer, the International Civil Engineer, the International Environmental Specialist, and the International Commissioning Engineer in (i) monitoring the Project implementation; (ii) collecting data and preparing documents; (iii) conducting project site visits, liaising with government agencies and

participating in public consultations, if required by the team leader; (iv) assisting with procurement process; (v) assisting in monitoring waste management and safeguard implementation; (vi) assisting in monitoring testing and commissioning of the equipment; and (vi) assisting with payment analysis.

98. The national consultants shall have a bachelor or higher degree in the related engineering field and at least 15 years of professional experience of major power plant projects. The consultants should be familiar with Pakistan legislation and should have worked on projects financed by international financial organizations. Work on ADB-funded projects is a plus.

G. Reporting requirements

99. The Consultants will prepare and submit to ADB and GHCL for review the BERs, a procurement capacity building plan, a procurement assessment report, an inception report, quarterly progress reports, monthly monitoring reports, a draft final report, and a final report including executive summary, following the schedule shown below:

- (i) The review report of bidding document and technical specification shall be submitted to GHCL, JPCL and ADB within 3 weeks of commencement.
- (ii) The BER of technical proposal shall be submitted to ADB within 10 weeks of 1st stage bid opening.
- (iii) The BER of financial proposal with recommendation on contract awarding shall be submitted to ADB within 4 weeks of 2nd stage bid opening.
- (iv) A procurement capacity building plan shall be submitted to ADB and GHCL within the second month of mobilization of procurement specialists. And a procurement capacity assessment report should also be submitted with the final report to evaluate the procurement capacity building progress.
- (v) The inception report shall be submitted to GHCL and ADB within the first month of the commencement of fieldwork. The inception report shall outline the proposed work program and any apparent barriers to prevent the successful completion of the Project.
- (vi) Quarterly progress reports shall be submitted to GHCL and ADB to address the progress and related issues rose during the project implementation on a quarterly basis.
- (vii) In addition to the progress reports, regular monthly monitoring reports should be sent to GHCL and ADB to inform the progress and related issues of the project. GHCL and ADB will review the progress of project implementation as well as monitor achievement of development objectives.
- (viii) Draft final draft report will be submitted after completion of the Project. Within one month of its submission to GHCL and ADB, a tripartite meeting comprising ADB, GHCL, and the Consultants will be held to discuss the draft final report and review its findings.
- (ix) The final report will be submitted within one month of receipt of comments from GHCL and ADB.

H. Level of Effort of Team of Consultants

100. The expected level of effort from the Firm is shown in the following tables.

A. For international consultants:

Team Member	Person-month
1. Team Leader/Power Plant Engineer	60
2. Mechanical Engineer	60
3. Procurement Specialist	12
4. Electrical Engineer	36
5. Control & Instrumentation Engineer	36
6. Civil Engineer	36
7. O & M Engineer	24
8. Environmental Specialist	24
9. Commissioning Engineer	24
10. Legal Advisor	10
11. Tariff Specialist	6
12. Ash Recycling Marketing Expert	6
13. Climate Change Specialist	3
Total	337

B. For national consultants:

Team Member	Person-month
1. Local Team Leader-Mechanical Engineer 1	60
2. Local Deputy Team Leader-Mechanical Engineer 2	60
3. Procurement Specialist 1	6
4. Procurement Specialist 2	6
5. RE (Electrical Engineer)	36
6. RE (Control & Instrumentation Engineer)	36
7. RE (Civil Engineer)	36
8. Environmental & Waste Management Specialist	36
9. RE (Commissioning Engineer)	24
10. Technical Support Staff	180
Total	480

I. Period

101. The assignment will be undertaken over a 120-month period on an intermittent basis (March 2014 to March 2024).

VIII. SAFEGUARDS

102. Pursuant to ADB's Safeguard Policy Statement (2009) (SPS),³⁰ ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS. The government through the JPCL will ensure that all safeguard requirements prescribed for project that have been prepared will be implemented. The project, in accordance with ADB SPS 2009, was categorized as "A" project for environment, as "B" project for

³⁰ Available at: <http://www.adb.org/Documents/Policies/Safeguards/Safeguard-Policy-Statement-June2009.pdf>

Involuntary Resettlement, and as “C” project for Indigenous People impacts. Therefore, the following safeguard documents were prepared during project preparation:

- (i) The Environmental Impact Assessment (EIA) report, including its Environmental Management Plan, was prepared. This report identified potential impacts related with the project and proposed mitigation measures and monitoring plan that presented in the Environmental management Plan (EMP). This EIA also includes the findings from environmental compliance audit report and recommended corrective actions for the existing facilities.
- (ii) The Land Acquisition and Resettlement Plan (LARP) for expansion of the Jamshoro TPS.

103. The government through GHCL and JPCL is obliged to implement recommendation from these two safeguard reports that were prepared with adequate consultation with people living in surrounding project areas. The following paragraphs describe briefly the activities to be implemented during project implementation and operation.

104. **Environment.** The project is classified as Category A under ADB’s SPS (2009). EIA report including EMP was drafted, disclosed per ADB public disclosure requirements of 120 days and is provided as Web-linked Documents in ADB website. GHCL and JPCL will ensure that the design, construction, and operation and maintenance of the facilities under the project are carried out in accordance with ADB’s SPS (2009), applicable laws and regulations in Pakistan, and recommendation from EIA and its EMP. GHCL and JPCL will ensure that potential adverse environmental impacts arising from the project are minimized by implementing all mitigation and monitoring measures as presented in the EMP included in the EIA. The EIA including EMP will be updated by the PMU and PIU and implemented by the PIU. An external monitor will be engaged to verify the monitoring information from the project. GHCL and JPCL will ensure that:

- (i) The PIU has sufficient resources to implement and record the implementation of the EMP prepared for the project;
- (ii) Undertake the measurement of the required baseline environmental data prior construction especially air quality, and ensure that the findings will be used in preparing detail design;
- (iii) If the findings and detailed designed will be changed, the updated EMP has to be prepared, and all necessary government’s permits and license to construct the expand Jamshoro TPS will be obtained;
- (iv) detailed engineering designs, civil works and other contracts for the project incorporate applicable environmental measures identified in the EIA and its EMP;
- (v) bidding document for supervision consultant/engineer will include necessary requirement to enable them to assist in implementing EIA and its EMP;
- (vi) all bidding documents for civil works include all safeguards requirement as described in the EIA and its EMP;
- (vii) the winning bidder will have adequate resources to implement safeguards requirement;
- (viii) EMP is updated prior to implementation of civil works;
- (ix) Starting from project commencement, the PIU will prepare annual environmental reports on implementation of EMP, and semi-annual environmental monitoring report after commencement of civil works. The report will include, among other things, a review of progress made on environmental measures detailed in the EIA and EMP, and problems encountered or unexpected impacts encountered during implementation and remedial measures taken to address those problems;

- (x) Civil works contractors are supervised and monitored to ensure compliance with the requirements of the EIA and EMP;
- (xi) If unexpected or unforeseen environmental impacts occurred, the environment specialist from PIU together with the supervision consultant, and contractor will promptly take corrective measures;
- (xii) The environmental specialist of PIC will assist PIU to report in routine basis to ADB as part of the quarterly project report any complaint received and action to resolve the complaint.

105. **Ash Management Plan (AMP).** Ash from the unit is expected to be recycled, however 100 acres of available land will be purchased for a lined ash disposal pond to store the ash in case there is a lag in demand from cement factory and other potential customers as a condition to contract award. An Ash Recycling Marketing Expert (ARME) shall be recruited under the project implementation consultant contract by JPCL. The following actions shall be taken to ensure the proper disposal/handling and recycling of ash: (i) an action plan shall be prepared within half an year of effectiveness of the loan, in discussion with GHCL, JPCL and ADB, which shall be approved by JPCL and ADB before implementation (AMP adoption will be condition for EPC contract award); (ii) ARME is assisting JPCL in liaising with the All Pakistan Cement Manufacturers' Association (APCMA) and facilitating the signing of a Memorandum of Understanding (MoU) between JPCL and selected cement manufacturers within a 100 km radius of the Jamshoro TPS on recycling ash for mixing in Ordinary Portland Cement (OPC) or in Blended Cement as prescribed by international and national guidelines. The signing of the MoU should be facilitated within one year of effectiveness of the loan; (iii) ARME is facilitating the signing of a pre-agreement between selected cement companies and JPCL through advocacy and confidence building measures by 2016. The Pre-agreement shall state the details of the ash and the specification of this product and the likely uses and quantities that will be available for each of the selected users. The pre-agreement will have all details and will be a commitment in all respects other than the terms and conditions for transfer of ash and any monetary aspects; (iv) If no such pre-agreement is signed, JPCL shall initiate the purchase of additional land for ash pond in accordance with ADB safeguard policy; (v) ARME assists JPCL in finalizing the ash recycling agreement between JPCL and the selected cement companies within one year from the commissioning; and (vi) if the ash recycling agreement is not signed, JPCL shall finish acquiring additional 200 acres of land no later than commissioning of the project.

106. **Land Acquisition and Resettlement (LAR).** The project is classified as Category B under ADB's SPS (2009). Project investments will be implemented in existing Jamshoro TPS where land acquisition and resettlement (LAR) impacts are not deemed significant. JPCL will monitor LARP implementation. In the event that further land acquisition and/or resettlement impacts are identified during project implementation, JPCL will ensure that such impacts are addressed in accordance with ADB's SPS (2009), including update land acquisition and resettlement plan in consultation with the affected people. GHCL and JPCL will ensure that:

- (i) The PIU will recruit social specialist to implement LARP and address other social concerns of the project if any;
- (ii) The LARP will be updated if the detailed design has been completed. The updated LARP report will be carried out with adequate consultation with affected people. The report should at least indicate any change on land acquisition from the detailed design, change on affected people, and change on budget for LARP implementation;

- (iii) The updated LARP has to be submitted to ADB to receive a concurrence prior to implementation;
- (iv) The updated LARP will be disclosed to affected people;
- (v) If the detailed design will not cause any change on land acquisition, the PMU has to provide ADB with written information that updated LARP is not required, and the existing LARP report will be implemented;
- (vi) The awarding of civil work contract will be done only after affected people receive full payment of compensation, and report on full payment of compensation needs to be submitted to ADB. The advance payment to the contractor only can be released by ADB after the report on full payment has been received by ADB;
- (vii) Report on monitoring the implementation of LARP including any grievance will be submitted to ADB on quarterly basis until the payment of compensations to affected parties has been fully paid;
- (viii) The social specialist of PIU will also observe any unanticipated impacts due to land acquisition and take necessary measures in accordance to the provisions described in the LARP.

107. **Indigenous Peoples.** The project is classified as Category C under ADB's SPS (2009). The project does not involve any territory, habitat, or common property that is managed by ethnic minority or indigenous people, and the project is not expected to generate impacts to indigenous people as described in ADB SPS (2009), because there is no such community living in surrounding project areas. Therefore, no arrangement was prepared to address indigenous people impacts as described in ADB SPS (2009). However, during the entire implementation of the project, the social specialist is obliged to observe any concerns related with this aspect.

IX. GENDER AND SOCIAL DIMENSIONS

108. **Gender Dimensions.** Indirect benefits of reliable energy supply will include reductions in women's time poverty, and improved health by reducing fume-related indoor pollution and water- and food- borne diseases (by being able to boil water and food appropriately).

109. The project will also explore how local women will be trained and employed in the cleaning of the new plants, and this will require monitoring.

110. **Social Dimensions.** The project does not entail impacts on affordability or operational employment opportunities. During construction the turnkey contractor will be required to ensure equal opportunities for all social groups, equal pay for equal work regardless of gender, and prohibition of child labor. The contractor will also be required to undertake HIV/AIDS awareness activities with imported workers.

X. PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION

A. Project Design and Monitoring Framework

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>Impact Enhanced energy supply</p>	<p>Peak load shedding reduced from 5,000 MW (2013) to 3,000 MW by 2023</p> <p>Large-scale manufacturing growth of at least 2% by 2023, compared to 1.2% (2011)</p>	<p>NTDC Electricity Marketing Data</p> <p>Pakistan Annual Economic Yearbook</p>	<p>Assumptions Political stability and security maintained</p> <p>The government commits to support ongoing reform of the power sector under the National Power Policy and is dedicated to the elimination of load shedding through enhanced, lower-cost supply</p> <p>Risk Insufficient enabling environment for private sector investment</p>
<p>Outcome More efficient energy mix (through diversification from expensive HFO)</p>	<p>Additional 4,468 GWh per annum of power generated from coal by 2019 (baseline: 89,238 GWh in 2010)</p> <p>Share of HFO in the power generation mix decreased to 30% by 2019 (baseline: 34%, August 2012)</p> <p>Share of clean coal in the power generation mix increased to 3% by 2019 (baseline: 0.14% installed, August 2012)</p> <p>NEPRA energy purchase price for Jamshoro TPS reduced by 30% by 2019 (baseline: \$0.212/kWh, June 2012)</p>	<p>NTDC Electricity Marketing Data</p> <p>NEPRA determination: monthly fuel price adjustment</p>	<p>Assumption Sufficient coal supply available and secured through medium-term coal supply agreements</p> <p>Risks JPCL is not paid sufficient amounts for maintenance and fuel</p> <p>Limited O&M capacity of Jamshoro TPS may be insufficient to optimize the coal-fired power unit</p>

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>3. Executing agency and implementation agency staff capacity enhanced</p> <p>3.1 Staff capacity of the executing and implementing agencies assessed by March 2014</p> <p>3.2 Capacity development plan prepared by May 2014</p> <p>3.3 Resource persons engaged by August 2014</p> <p>3.4 Training manuals developed by December 2014</p> <p>3.5 Training commenced by March 2015</p> <p>4. Coal-fired power plant operation introduced in training curriculum</p> <p>4.1 Partnership with technical school facilitated by June 2014</p> <p>4.2 Course on CFPP operation designed by May 2015</p> <p>4.3 Course on CFPP operation introduced by September 2015</p>			

ADB = Asian Development Bank, ADF = Asian Development Fund, CFPP = coal-fired power plant, EIA = environmental impact assessment, EPC = engineering, procurement, and construction, FGD = flue gas desulfurization, HFO = heavy fuel oil, GHCL = GENCO Holding Company Limited, GWh = gigawatt-hour, JPCL = Jamshoro Power Company Limited, kWh = kilowatt-hour, MW = megawatt, NEPRA = National Electric Power Regulatory Authority, NTDC = National Transmission and Despatch Company, O&M = operation and maintenance, OCR = ordinary capital resources, TPS = thermal power station.

^a Bioremediation of the contaminated soil will not affect the target dates for the outcome indicators.

^b Agreement with Water and Power Development Authority technical school or other equivalent school will be signed prior to EPC contract award.

Source: Asian Development Bank.

B. Monitoring

111. **Project performance monitoring.** Following indicators will be updated in the quarterly progress reports and at the time of semi-annual meetings and the midterm review expected in two years from the date of loan effectiveness for Jamshoro TPS.

Indicator	Units	EA responsible for data collection and Reporting
• Availability and plant factor of each unit	%	GHCL / JPCL
• Efficiency rating of each unit	%	GHCL / JPCL
• Power output of each unit	MW	GHCL / JPCL
• Power generated by unit	GWh	GHCL / JPCL
• Annual fuel consumption by unit	Ton or m ³	GHCL / JPCL
• Annual water consumption by unit	m ³	GHCL / JPCL
• Power outage by unit	hour	GHCL / JPCL
• Scheduled maintenance (hour) for each unit	hour	GHCL / JPCL
• Annual CO ₂ emission	tCO ₂ e	GHCL / JPCL
• SO ₂ emission	g/s	GHCL / JPCL
• PM 10 emission	g/s	GHCL / JPCL
• PM 2.5 emission	g/s	GHCL / JPCL
• NO _x emission	g/s	GHCL / JPCL

GHCL = GENCO Holding Company Limited, GWh = gigawatt-hour, JPCL = Jamshoro Power Company Limited, MW = megawatt, PM = particulate matters, tCO₂e = tons of CO₂ equivalent.

112. **Compliance monitoring:** Loan covenants – i.e., policy, legal, financial, economic, environmental, and others, will be monitored through semi-annual project meeting and the midterm review.

113. **Safeguards monitoring** will be performed by the PIC and PIU. The monitoring results will be included in the quarterly progress reports, Environmental Management Plan (EMP) and semi-annual environmental reports.

114. **Gender and social dimensions monitoring:** Monitoring is not required for gender as the project does not have a gender element. Monitoring on equal employment opportunities for all social groups, equal pay for equal work regardless of gender, and prohibition of child labor will be monitored by the PIC and PIU. The monitoring results will be included in the

quarterly progress reports and semi-annual environmental reports.

C. Evaluation

115. **Inception Mission.** ADB will field an inception mission after loan signing to (i) establish a working relationship between ADB and the EAs; and (ii) to ensure that the Borrower and EAs understand ADB's procedures.

116. **Review Missions.** ADB will field review missions at least once a year to review overall implementation of the project and update project implementation schedule based on mission findings.

117. **Midterm Review Mission.** ADB will field a midterm review mission after two years of loan signing to assess whether attainment of the project's immediate objective (purpose in terms of the design and monitoring framework) is still likely.

118. **Project Completion Review Mission.** ADB will field a project completion review (PCR) mission upon physical completion of the project to commence preparation of ADB's project completion report. GHCL and JPCL will submit a project completion report to ADB within 6 months of physical completion of the project.³¹

D. Reporting

119. GHCL and JPCL will jointly provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions; (c) updated procurement plan and (d) updated implementation plan for next 12 months, and (iii) a project completion report within 6 months of physical completion of the Project . To ensure projects continue to be both viable and sustainable, project financial statements and GHCL AFSs, together with the associated auditor's report, should be adequately reviewed. GHCL is responsible for submission of reports to ADB.

E. Stakeholder Communication Strategy

120. Project information will be strategically disseminated through media at main milestones including loan signing, contract awards and project completion. Grievance redress mechanism will establish at the PMU, by phone and email, and through public consultation events. GHCL and JPCL will ensure that (i) designation of a focal point for regular contact with project-affected people and other stakeholders; (ii) identification of mechanisms for feedback during design and implementation; (iii) details of types of information to be disclosed, mechanisms for public notice including language and timing, and responsibility for implementing and monitoring disclosure and dissemination.

³¹ Project completion report format available at: <http://www.adb.org/Consulting/consultants-toolkits/PCR-Public-Sector-Landscape.rar>

ADB Public Communications Strategy

Project Documents	Means of Communication	Responsible Party	Frequency	Audience(s)
Project Information Document (PID)	ADB's website	ADB	initial PID no later than 30 calendar days of approval of the concept paper; quarterly afterwards	General Public
Design and Monitoring Framework (DMF)	ADB's website	ADB	draft DMF after post fact-finding mission	Project-affected people
Environmental Impact Assessment	ADB's website	ADB	at least 120 days before Board consideration	General Public, project-affected people in particular
Resettlement Planning Documents	ADB's website	ADB	post fact-finding mission	General Public, project-affected people in particular
Report and Recommendation of the President	ADB's website	ADB	within 2 weeks of Board approval of the loan	General Public
Legal Agreements	ADB's website	ADB	no later than 14 days of Board approval of the project	General Public
Initial Poverty and Social Assessment	ADB's website	ADB	within 2 weeks of completion	General Public, project-affected people in particular
Documents Produced under Technical Assistance	ADB's website	ADB	within 2 weeks of completion	General Public
Project Documents	Means of Communication	Responsible Party	Frequency	Audience(s)
Project Administration Manual	ADB's website	ADB	After loan negotiations	General Public
Social and Environmental Monitoring Reports	ADB's website	ADB	routinely disclosed, no specific requirements	General Public, project-affected people in particular
Major Change in Scope	ADB's website	ADB	within 2 weeks of approval of the change	General Public
Progress Reports	ADB's website	ADB	within 2 weeks of Board or management approval	General Public
Completion Report	ADB's website	ADB	within 2 weeks of circulation to the Board for information	General Public
Evaluation Reports	ADB's website	ADB	routinely disclosed, no specific requirements	General Public
Performance of the investment program with clearly defined information requirements and indicators, policy construction and reconstruction, business opportunities, bidding process and guidelines, results of bidding process, and summary progress reports of ongoing projects.	The borrower's Website	The borrower (Executing Agency)	per project progress, no longer than monthly	General Public

XI. ANTICORRUPTION POLICY

121. The Borrower, through the GHCL and JPCL, shall comply with ADB's Anticorruption Policy (1998, as amended to date),³² and operate fully with any investigation by ADB and extend all necessary assistance, including providing access to all relevant books and records for the satisfactory completion of such investigation. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project. GHCL and JPCL shall ensure that anticorruption provisions acceptable to ADB are included in all bidding documents and contracts, including provisions specifying the right of ADB to audit and examine the records and accounts of GHCL, JPCL and all project consultants, suppliers, consultants and other service providers as they relate to the Project. Individuals/entities on ADB's anticorruption debarment list are ineligible to participate in ADB financed activity and may not be awarded any contracts under the project.³³

122. To support these efforts, relevant provisions are included in the loan agreement/regulations and grant agreement/regulations and the bidding documents for the project. Procurement will follow ADB Procurement Guidelines (2013, as amended from time to time), consultant selection will adopt ADB Guidelines on the Use of Consultants (2013, as amended from time to time), and disbursement will be made in accordance with ADB's disbursement policies, guidelines, practices, and procedures.

XII. ACCOUNTABILITY MECHANISM

123. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB, or request the review of ADB's compliance under the Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make a good faith effort to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.³⁴

XIII. RECORD OF PAM CHANGES

None as of 31 October 2013

³² Available at: http://www.adb.org/Documents/Policies/Anticorruption-Integrity/Policies_Strategies.pdf

³³ ADB's Integrity Office web site is available at: <http://www.adb.org/integrity/unit.asp>

³³ For further information, see: <http://www.adb.org/Accountability-Mechanism/default.asp>.

³⁴ For further information see: <http://www.adb.org/Accountability-Mechanism/default.asp>.