ADB ASIAN DEVELOPMENT BANK

Pakistan: Jamshoro Power Generation Project

Project Name	Jamshoro Power Generation Project
Project Number	47094-001
Country	Pakistan
Project Status	Active
Project Type / Modality of Assistance	Loan
Source of Funding / Amount	**Loan 3090-PAK: Jamshoro Power Generation Project** Ordinary capital resources — US$ 840.00 million **Loan 3091-PAK: Jamshoro Power Generation Project** Ordinary capital resources — US$ 30.00 million **Loan 3092-PAK: Jamshoro Power Generation Project** concessional ordinary capital resources lending / Asian Development Fund — US$ 30.00 million **Loan: Jamshoro Power Generation Project** Islamic Development Bank — US$ 150.00 million **Loan: Jamshoro Power Generation Project** Islamic Development Bank — US$ 70.00 million
Strategic Agendas	Inclusive economic growth
Drivers of Change	Governance and capacity development Partnerships
Sector / Subsector	**Energy** - Conventional energy generation
Gender Equity and Mainstreaming	No gender elements
Description	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. The project will (i) increase the 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; (ii) provide 5 years of operation and maintenance (O&M) support; (iii) improve compliance with international and national environmental standards by installing emission control devices for the existing units and remediating the site; (iv) enhance the capacity of GENCO Holding Company Limited (GHCL) and Jamshoro Power Company Limited (JPCL) by providing financial, technical, and operational training; and (v) promote education on coal-fired plant operation by providing on-the-job training, and integrating such training into technical school curriculum. The infrastructure developed will also support government's plan to have an additional 600-MW unit at the same site.

Project Rationale and Linkage to Country/Regional Strategy	Pakistan is exploring options to reduce 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, 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. 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 to 5,000 MW) during most of FY2012 (ending July 2012). Increasing, unpredictable load shedding is estimated to constrain annual gross domestic product (GDP) growth by at least 2%. 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. Low economic growth creates an environment for recruitment by societys radical elements. The government introduced, as a priority, the new National Energy (Power) Policy (Power Policy) to tackle these issues. As a first step, PRs480 billion was paid to fuel companies and independent power producers to clear payment arrears. The government is also pursuing tariff rationalization and energy efficiency measures such as conservation, transmission and distribution loss reduction, and rehabilitation of existing power plants. High-power generation cost. Pakistan has 23,538 MW of installed power generation capacity and 14,000 MW of available capacity on average. Many HFO-fired power plants are not fully utilized because of a shortage of funds for fuel. The increase in HFO-fired power generation is the major reason the cost-recovery tariff (average tariff) has continuously increased. The government has increased the base tariff by 106% from February 2008 to June 2013, while the subsidy has increased to PRs5.79 per kilowatt-hour (kWh). For fiscal and economic sustainability, the government must lower electricity generation costs and increase supply to reduce shortages. 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, replacing old inefficient units, and constructing new plants. The imported HFO costs several times more than domestic or imported coal, and has higher sulfur content. Electricity generated from coal, through medium-term fuel supply contracts, will also help stabilize the power price. The Power Policy includes plans to diversify the energy mix, and the National Electric Power Regulatory Authority (NEPRA) recently announced a new upfront tariff calculation methodology to encourage investment in coal-fired power projects. Renewable and gas-based generation. To improve energy security and affordability, the government will also pursue 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, and accounted for just 26% of power generated in 2012. Only 6,716 MW of a potential of over 40,000 MW of hydropower has been tapped, making hydropower from large dams the ideal solution. However, the long implementation and complex safeguard issues mean this is a long-term option. Domestic gas-fired generation will decline from the current 26% because of depletion of existing fields, and competing demand from industry, transport, and retail customers unless domestic gas supplies are increased. Wind and solar corridors are being explored, but their outputs are variable and would not meet the base-load requirements. Power generation mix. Oil-fired power generation is expensive, and is used for less than 5% of world generation. To be competitive economically, Pakistan cannot afford a continued reliance on expensive imported oil for 34% of power generation. Pakistan has one of the lowest carbon emissions, just 19% of the world's average. Potential coal reserves in Pakistan may generate 100,000 MW of power for 350 years. Globally, coal-based power plants generate 40% of power, but account for just 0.07% of generation in Pakistan. Poverty reduction and provision of basic necessities to the poor are immediate challenges for Pakistan. ADB interventions. ADB is engaged in the Pakistan energy sector through its multitranche financing facilities, which fund energy efficiency, transmission, distribution, and renewable energy projects. As the sectors largest donor, ADB conducts policy dialogue on reforms, planning and implementation, and provides periodic sector assessments to country reviews of the International Monetary Fund. Ongoing reforms follow the recommendations in the report of the Friends of Democratic Pakistan Energy Task Force, which ADB co-chaired with the government. The report addresses diversification of existing fuel sources. The project is included in the country operation business plan for Pakistan.
Impact	Enhanced energy supply

Project Outcome

Description of Outcome	More efficient energy mix (through diversification from expensive HFO)

Progress Toward Outcome	Procurement for EPC-O&M for 2X660MW Supercritical Power Plant commenced in May 2016 with contract award expected in 2017. Bidding for the site remediation civil works commenced in February 2016. Contracts for Lot I Renovation of Effluent Evaporation Ponds, Lot II-Construction of Channel for disposal of Cooling Tower Blow Down and Lot III-Construction of Municipal Solid Waste Disposal Facility were awarded in Q4 2016. Procurements for Lot IV-Construction of Hazardous Solid Waste Disposal Facility, Lot V-Construction of Sewage Treatment Plant and Site Remediation are ongoing. As of 28 March 2017, the total Project's contract awards amount to $22.768 million and total disbursements amount to $9.564 million or 3% and 11% of total ADB financing, respectively.
Implementation Progress	
Description of Project Outputs	1. Jamshoro TPS capacity increased 2. National environmental standards complied with by Jamshoro TPS 3. Executing agency and implementation agency staff capacity enhanced 4. Coal-fired power plant operation introduced in technical school curriculum
Status of Implementation Progress (Outputs, Activities, and Issues)	Contracts for site remediation works (Lot I Renovation of Effluent Evaporation Ponds, Lot II-Construction of Channel for disposal of Cooling Tower Blow Down and Lot III-Construction of Municipal Solid Waste Disposal Facility) were awarded in Q4 2016. Physical site remediation works commenced. Procurements of Lot IV-Construction of Hazardous Solid Waste Disposal Facility and Lot V-Construction of Sewage Treatment Plant contracts are retendered and currently ongoing. The procurement of soil remediation is also ongoing. Jamshoro thermal unit 2 -_ 4 are run on natural gas while unit 1 is run on liquid oil. JPCL is considering various options to remedy the emission of unit 1. The need for FGD emission control devices is yet to be reconfirmed. Terms of Reference for Capacity Development Consultant were prepared but under revision. Recruitment is expected to commence by Q2 2017. Preparation of training manuals will be done by the capacity development consultant to be engaged. Appropriate curriculum design is yet to be identified by the Capacity Development Consultant. Procurement for coal supply contract is ongoing and will be completed by the time of EPC contract award. The railway infrastructure is being strengthened by the government and the discussion are ongoing for the coal handling and delivery service.
Geographical Location	Jamshoro

Safeguard Categories

Environment	A
Involuntary Resettlement	B
Indigenous Peoples	C

Summary of Environmental and Social Aspects

Environmental Aspects	This project is categorized as _A_ for environment. The project will benefit the environment by restoring the site and reducing the sulfur emissions per kWh generated in comparison with power generated from high-sulfur HFO. In compliance with ADB's Safeguard Policy Statement (2009), an environmental audit of the existing facility and environmental impact assessment study of the planned two new units was prepared, with the draft disclosed on 26 June 2013. The new coal-fired unit will produce large quantities of ash and soot, requiring specific handling (para. 20). Site remediation will address contamination issues, such as oil-contaminated soil, waste metals, and asbestos disposal. Mitigation measures include (i) effluent water management, (ii) construction of a hazardous waste storage facility, (iii) development of a landfill site for colony waste, (iv) rehabilitation of evaporation ponds, (v) emissions control measures to address excessive SO2emissions, and (vi) ash disposal and traffic management. As a loan requirement, the implementing agency will implement an annual comprehensive monitoring program to measure GHG emissions and effluent. Project management and project implementation unit environment staff will be supported and trained to ensure compliance during implementation and operation. Training sessions will be held for engineers to mainstream environmental safeguards. Background levels of fine particulate matter (less than 2.5 microns in diameter [PM2.5]) in the project area exceed the applicable standards. The high levels of PM2.5 are generally attributed to informal power generation sources, which use dirty fuels and less efficient generation, and are employed to meet the country's power shortages. An offset for the plant's emissions of PM2.5 will be designed and implemented, with technical assistance, through further assessment of air quality and pollution sources within the airshed. The project will help reduce the power shortage and replace these fuels, which is expected to improve the baseline air quality and help offset the plant's emissions. The PIC will assess options to offset the project's GHG emissions, including reforestation through a collaborative United Nations initiative.
Involuntary Resettlement	The project is categorized as _B_ for resettlement. Approximately 100 acres of land belonging to 18 landowners (with a total of 106 family members) is required for an ash pond at Jamshoro TPS. Consultations were held with the owners and they are willing to negotiate with JPCL on the price. A land acquisition and resettlement plan was prepared and disclosed on ADB's website on 19 September 2013; it will be updated to reflect the final list of owners and price agreed between the owners and JPCL.

Indigenous Peoples	There will be no impact on indigenous peoples.
Stakeholder Communication, Participation, and Consultation	
During Project Design	The project will generate electricity that will be fed into the national grid. All consumers (urban, rural, industrial, agricultural, commercial and domestic) connected to the grid are potential beneficiaries; however their direct participation is not relevant to the project design.
During Project Implementation	The sites are contained within operating power plants. The only directly affected people are those affected by resettlement; they were closely consulted in preparation of the Land Acquisition and Resettlement Plan, and will participate in its implementation. Roadshows will be conducted to attract eligible coal suppliers and EPC contractors as well as build more market-friendly bidding documents. A Roadshow for EPC contractors and coal suppliers was held in May 2015 in Singapore. Another Roadshow for coal suppliers was held in October 2015 in Indonesia.

Business Opportunities

Consulting Services	All consultants will be recruited according to ADB's Guidelines on the Use of Consultants. 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. Project implementation consultant (international consulting firm) has been selected and mobilized to: (i) review conceptual design and bidding documents; (ii) assist in the recruitment of engineering contractors in accordance to ADB's Procurement Guidelines; (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 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 120 months. Capacity development consultant will likewise be engaged to assist GHCL and JPCL in developing its capacity for future coal project expansion. Terms of Reference for such is under preparation.
Procurement	All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines. JPCL will select the most appropriate contract form with ADB prior concurrence. A multi-stage bidding procedure without prequalification is preferred for the procurement of an EPC contract for the construction of two new supercritical coal-fired unit with 5-year O&M service contract. The procurement will follow international competitive bidding (ICB) procedures. Invitation for technical proposal was issued on 6 May 2016, and technical proposals were received on 26 Aug 2016. Technical bid evaluation is ongoing. Procurement of certain packages for the site preparation civil works (Lots I, II, and III) were awarded in Dec 2016 while for others (Lots IV and V) were retendered and are ongoing. Procurement for soil remediation contract is also ongoing.

Responsible Staff

Responsible ADB Officer	Kim, Seung Duck
Responsible ADB Department	Central and West Asia Department
Responsible ADB Division	Energy Division, CWRD
Executing Agencies	*GENCO Holding Company Limited* *SM_ZAFAR1@HOTMAIL.COM* *Room No. 197, WAPDA House, Shahrah-e-Quaid-e-Azam* *Lahore, Pakistan 54000*

Timetable

Concept Clearance	05 Jun 2013
Fact Finding	25 Jul 2013 to 02 Aug 2013
MRM	26 Sep 2013
Approval	09 Dec 2013
Last Review Mission	-
Last PDS Update	29 Mar 2017

Loan 3090-PAK

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual

09 Dec 2013	12 Feb 2014	20 Nov 2014	31 Mar 2019	-	-

Financing Plan		Loan Utilization			
	Total (Amount in US$ million)	Date	ADB	Others	Net Percentage
Project Cost	1,370.00	Cumulative Contract Awards			
ADB	840.00	09 Dec 2013	4.51	0.00	1%
Counterpart	380.00	Cumulative Disbursements			
Cofinancing	150.00	09 Dec 2013	4.25	0.00	1%

Loan 3091-PAK

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
09 Dec 2013	12 Feb 2014	20 Nov 2014	30 Jun 2024	-	-

Financing Plan		Loan Utilization			
	Total (Amount in US$ million)	Date	ADB	Others	Net Percentage
Project Cost	30.00	Cumulative Contract Awards			
ADB	30.00	09 Dec 2013	0.75	0.00	3%
Counterpart	0.00	Cumulative Disbursements			
Cofinancing	0.00	09 Dec 2013	0.13	0.00	0%

Loan 3092-PAK

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
09 Dec 2013	12 Feb 2014	20 Nov 2014	31 Mar 2019	-	-

Financing Plan		Loan Utilization			
	Total (Amount in US$ million)	Date	ADB	Others	Net Percentage
Project Cost	30.00	Cumulative Contract Awards			
ADB	30.00	09 Dec 2013	17.50	0.00	65%
Counterpart	0.00	Cumulative Disbursements			
Cofinancing	0.00	09 Dec 2013	5.44	0.00	20%

Project Page	https://www.adb.org/projects/47094-001/main
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