ADB ASIAN DEVELOPMENT BANK

Bangladesh: Power System Efficiency Improvement Project

Project Name	Power System Efficiency Improvement Project
Project Number	37113-013
Country	Bangladesh
Project Status	Approved
Project Type / Modality of Assistance	Loan
Source of Funding / Amount	**Loan 2769-BAN: Power System Efficiency Improvement Project** Ordinary capital resources — US$ 300.00 million **Loan: Power System Efficiency Improvement Project** Islamic Development Bank — US$ 200.00 million
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth
Drivers of Change	Partnerships
Sector / Subsector	Energy - Energy efficiency and conservation - Renewable energy generation - solar
Gender Equity and Mainstreaming	Effective gender mainstreaming
Description	The draft power sector master plan update 2010 identifies the need to add 11 CCPPs each with 450 MW capacity in 2010 2016. The proposed Ashuganj 450 MW plant (part A) can be considered one of these CCPPs. Further, the government has identified the proposed plant as a priority project in its expansion plan. The economic cost of electricity supply from the Ashuganj CCPP is similar to or lower than those of a coal-fired power plant (based on the costs taken from the master plan), confirming that the proposed plant is among the least-cost options for generating new capacity. CCPP design will use the latest commercially available technology to harness the maximum benefit of energy efficiency. Part B of the project will demonstrate renewable energy technologies and their application for long-term large-scale penetration into the Bangladesh power system. The subcomponents in part B use solar photovoltaic, wind power, and LEDs, which are commercially proven technologies.

Project Rationale and Linkage to Country/Regional Strategy	Energy shortage is considered the most critical infrastructure constraint to Bangladesh's economic growth. The present maximum demand for electricity is about 5000 MW (Megawatt) and it is expected to rise to 7,000 MW in two years. But the maximum available generation is about 3,800 MW leaving a significant supply gap. The main causes for the supply shortage, among others, are (i) poor operational efficiency of thermal power plants (ii) inadequate supply of natural gas which forms the main source of primary energy for electricity generation (80 % of generation capacity is based on natural gas) (iii) slow progress on cross-border energy cooperation; and (iv) lack of diversification in energy supply. To address shortages, the power plants meant for peaking load operation are being used for base-load generation making their operation extremely energy inefficient. These issues have also been highlighted in the ADB's 2009 Bangladesh energy sector assistance program evaluation (SAPE) . In the absence of lack of private sector interest in recent times and considering the critical requirement of base-load power generation SAPE has recommended public sector investment in base-load power plants. Government of Bangladesh (GOB) has declared its vision for power sector to make the country free from load shedding beyond 2010 and to make electricity available for all by the year 2020. In order to fulfill the vision, additional 9000 MW electricity generation will have to be installed within the next 5 years. Of this 5400 MW would be constructed by the private sector. In this regard GOB expects to increase the available generation capacity to 7000MW by 2015. Adequate transmission and distribution facilities would also be developed to complement generation development to increase access to electricity. Since the declaration of this policy, 586 MW of generation capacity has been added to the system while a number of approvals have been granted for new power plants. Also initiatives have been taken to diversify the energy sources including development of coal resources and renewable energy. In line with the government policy, ADB country partnership strategy for Bangladesh (CPS) addresses the main issues in the energy sector. It emphasizes on (i) continuation of the policy, legal and regulatory reforms to create enabling business environment for the private sector; (ii) implementation of power transmission interconnections with India; (iii) investment in new power generation facilities and rehabilitation of old power plants for improved efficiency (iv) increased investment in clean energy such as wind and solar power through public private partnerships; and (v) transmission network strengthening for expected generation capacity additions. The most important development in 2010 is the signing of the memorandum of understanding on energy cooperation between India and Bangladesh. Specific areas of cooperation include (i) India s agreement to supply on a fast track basis at least 250 MW of power to Bangladesh; (ii) joint development of thermal power generation facilities in Bangladesh. Facilitating this process ADB has approved a loan to construct the 500MW Bangladesh-India electricity transmission interconnection in the western border of Bangladesh. The proposed loan will address three key areas in the electricity supply sector. They are, improving operational efficiency of thermal power plants, expanding the renewable energy base and improving the transmission network capacity. A project preparatory technical assistance (PPTA) has been undertaken to prepare the project for ADB financing. The project interventions will include: (i) replacing some of the old power plants at Ashuganj power station (260MW, consisting of one old combined cycle plant and two steam turbine plants) with a more efficient combined cycle power plant (450MW); (ii) conversion of less efficient peaking plants at Siddhirganj (2x120MW) to a combined cycle power plant (318MW); (iii) installation of a 5MW solar photovoltaic (PV) at Kaptai hydropower plant premises; (iv) installation of wind-solar hybrid systems in St Martin (0.75 MW) and Hatiya (1 MW) islands; and (v) construction of 400kV Aminbazar-Maowa-Mongla (192km), 230kV Mongla-Khulna South (40km) and 132kV Mymenshing-Bhaluka-Tangail (100km) transmission lines and accompanying facilities. Capacity development in the executing agencies in the form of implementation support and training related to operation and maintenance and gender mainstreaming will be provided. Capacity development of beneficiary communities on operation and maintenance of off-grid systems will also be undertaken.
Impact	Increased provision of better access to electricity

Project Outcome	
Description of Outcome	Increased electricity generating capacity
Progress Toward Outcome	Constant monitoring of progress against time bound action plan is satisfactory. The physical progress is a bit slow compared to implementation schedule.
Implementation Progress	
Description of Project Outputs	Improved energy efficiency Increased renewable energy use Capacity developed in the EAs and surrounding communities
Status of Implementation Progress (Outputs, Activities, and Issues)	Contract for construction of Ashuganj 450 MW CCPP (North) Project approved by ADB on 14 November 2013 and signed on 1 Dec 2013. Progress needs to be accelerated. Contract award for Kaptai Solar PV project is expected to be completed in the Q2 2015. Evaluation of bids for Hatiya Hybrid system is ongoing and contract will be awarded by Q2 2015. Bids for solar street project is scheduled to be opened on 12 April 2015.
Geographical Location	

Safeguard Categories	
Environment	A
Involuntary Resettlement	B
Indigenous Peoples	C

Summary of Environmental and Social Aspects	
Environmental Aspects	The project is classified under environmental category A due to the installation of the 450 MW Ashuganj combined cycle power plant (CCPP). The government also classified this component as category A, and an environmental impact assessment has been preapred in May 2009 based on the Environmental Conservation Rules of 1997. The environmental impact assessment was approved by the Department of Environment on 5 May 2010 and revised to conform with ADB's Safeguard Policy Statement (2009). The Ashuganj CCPP will be located within the existing Ashuganj power station complex. The project will use natural gas as fuel and meet the cooling water requirements of 6.4 cubic meters cubic meters per second, or 52,000 cubic meters per gigawatt-hour, using water from the Meghna River, which will be released back to the river after 3% 5% loss, or 1,500 2,600 cubic meters per gigawatt-hour. CCPP technology has high thermal efficiency, and a burner will be used that limits the formation of nitrogen oxide. A pond will temporarily hold cooling water discharges, and the discharge channel will have adequate turbulence to dissipate heat before its final discharge back into the Meghna River. The plan for abandoning the replaced power plant units will be prepared by APSC. ADB will review the plan prior to any decommissioning works. The other subprojects in part B are classified as environmental category B. Initial environmental examination reports have been prepared in compliance with ADB's Safeguard Policy Statement. Part B will utilize clean energy technologies to reduce greenhouse gas emissions by 25,460 tons per year. The subprojects have been assessed for their risk and vulnerability to climate change impacts, and design measures have been integrated to ensure that these risks are minimized. The environmental impact assessment and initial environmental examination reports were publicly disclosed through the ADB website on 25 March 2011. The EAs are committed to implementing the environmental management plan and submitting semiannual environmental monitoring reports to ADB.
Involuntary Resettlement	The project is classified under involuntary resettlement category B. Constructing the Ashuganj CCPP will require relocating 134 people to alternative, vacant, and suitable accommodation inside the Ashuganj power station company (APSC)compound. Affected people have been consulted on the process and consented to relocation under the terms promised by APSC . Relocation will be fully managed by APSC through a resettlement plan, the provisions of which shall comply with the ADB Safeguard Policy Statement. Other resettlement impacts include the acquisition of 3.5 hectares of small landholdings on Hatiya, and minor and temporary nuisances and disturbances caused during the retrofitting and upgrading of streetlights, all of which will be minimized through mitigation. Compensation for any temporary or permanent loss of crops and trees will accord with entitlements indicated in resettlement plans. Care will be taken to engage and consult with stakeholders as necessary and in a culturally sensitive manner. The EAs will ensure that project information is disclosed and disseminated to project stakeholders in a timely manner. If, during implementation, adjustments are made to the project, these will be reflected in the entitlement matrix in consultation with displaced and otherwise affected people.
Indigenous Peoples	The project is classified under indigenous peoples category C. No indigenous groups have been identified as potentially affected by the project. Additionally, where worker migration is required, the project will minimize the risk of HIV/AIDS through information dissemination campaigns at project areas per the provisions in the project administration manual.

Stakeholder Communication, Participation, and Consultation	
During Project Design	The project is classified under environmental category A due to the installation of the 450 MW Ashuganj CCPP. The government also classified this component as category A, and APSC prepared an environmental impact assessment in May 2009 based on the Environmental Conservation Rules of 1997. The environmental impact assessment was approved by the Department of Environment on 5 May 2010 and revised to conform with ADB's Safeguard Policy Statement (2009). The other subprojects in part B are classified as environmental category B. Initial environmental examination reports have been prepared in compliance with ADB's Safeguard Policy Statement. Part B will utilize clean energy technologies to reduce greenhouse gas emissions by 25,460 tons per year. The subprojects have been assessed for their risk and vulnerability to climate change impacts, and design measures have been integrated to ensure that these risks are minimized. The environmental impact assessment and initial environmental examination reports were publicly disclosed through the ADB website on 25 March 2011. The EAs are committed to implementing the environmental management plan and submitting semiannual environmental monitoring reports to ADB.
During Project Implementation	The project is classified under involuntary resettlement category B. Constructing the Ashuganj CCPP will require relocating 134 people to alternative, vacant, and suitable accommodation inside the Ashuganj industrial compound. Affected people have been consulted on the process and consented to relocation under the terms promised by APSC. Relocation will be fully managed by APSC through a resettlement plan, the provisions of which shall comply with the ADB Safeguard Policy Statement. Care will be taken to engage and consult with stakeholders as necessary and in a culturally sensitive manner. The EAs will ensure that project information is disclosed and disseminated to project stakeholders in a timely manner. If, during implementation, adjustments are made to the project, these will be reflected in the entitlement matrix in consultation with displaced and otherwise affected people.

Business Opportunities	
Consulting Services	All the consulting firms will be recruited by using the quality and cost-based selection method in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). The outline terms of reference (TOR) for the consulting services are in Section D. APSCL will recruit one consulting firm to support the implementation of Ashuganj 450MW CCGT Power Plant Project, about 26 person-months (PM) of international consultants and 60 PM of national consultants will be required. BPDP will recruit one consulting firm for each component of Part B to (i) prepare technical specifications and bidding documents; (ii) support the tendering process and bid evaluation; (iii) supervise construction from the owner's perspective; (iv) supervise the testing and commissioning of the power plant from the owner's perspective; and (v) hand over the plants including issuance of provisional acceptance certificates and final acceptance certificates. For Kaptai 5MW on-grid solar PV project, about 7 PM of international consultants and 22 PM of national consultants will be needed. For Hatiya demonstrate wind-solar-diesel off-grid plant project and Solar-LED street lighting project, respectively, about 27 PM of international and 68 PM of national consultants, 9 PM of international and 24 PM of national consultants, will be required.
Procurement	All procurement of goods and works will be undertaken in accordance with ADB's Procurement Guidelines. For procurement under Part A, an expanded list of eligible countries to allow participation by firms and entities from countries eligible under ADB Procurement Guidelines and IsDB Procurement Guidelines. International competitive bidding procedures will be followed for all the procurement.

Responsible ADB Officer	Paul Hattle
Responsible ADB Department	South Asia Department
Responsible ADB Division	Bangladesh Resident Mission
Executing Agencies	*Bangladesh Power Development Board (BPDB)WAPDA Building, 9th Floor Motijhel C/A Dhaka-1000,Bangladesh Ashuganj Power Station Company Ltd. (APSCL)PD450NORTH@APSCL.COMAshuganj, B-Baria 3402, Bangladesh Power Div-Min of Power, Energy & Mineral ResourcesBangladesh Secretariat Dhaka Bangladesh*

Timetable	
Concept Clearance	08 Feb 2011
Fact Finding	09 Feb 2011 to 17 Feb 2011
MRM	28 Apr 2011
Approval	11 Aug 2011
Last Review Mission	-
Last PDS Update	29 Mar 2015

Loan

Financing Plan		Loan Utilization			
	Total (Amount in US$ million)	Date	ADB	Others	Net Percentage
Project Cost	281.20	Cumulative Contract Awards			
ADB	0.00	-	0.00	0.00	%
Counterpart	81.20	Cumulative Disbursements			
Cofinancing	200.00	-	0.00	0.00	%

Loan 2769-BAN

Milestones					
Approval	Signing Date	Effectivity Date	Closing		
			Original	Revised	Actual
11 Aug 2011	04 Jan 2012	03 Oct 2012	31 Dec 2017	-	-

Financing Plan		Loan Utilization			
	Total (Amount in US$ million)	Date	ADB	Others	Net Percentage

Project Cost	581.20	Cumulative Contract Awards			
ADB	300.00	11 Aug 2011	158.68	0.00	53%
Counterpart	81.20	Cumulative Disbursements			
Cofinancing	200.00	11 Aug 2011	51.21	0.00	17%

Status of Covenants						
Category	Sector	Safeguards	Social	Financial	Economic	Others
Rating	-	-	-	-	-	Satisfactory

Project Page	http://www.adb.org/projects/37113-013/main
Request for Information	http://www.adb.org/forms/request-information-form?subject=37113-013
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