

**RISK ASSESSMENT AND RISK MANAGEMENT PLAN**

<b>Risk Description</b>	<b>Rating</b>	<b>Mitigation Measures</b>	<b>Responsibility</b>
<b>Financial Management and Sustainability</b>			
NWPGCL has incomplete information reporting systems. It currently conducts its operations, particularly with regard to financial reporting, through spreadsheets and has no modern information systems in place.	M	NWPGCL will implement an automated ERP system funded by ADB, which will significantly improve the preparation of financial statements and facilitate reconciliation with project-level accounts, as well as the entire business process of the company.	NWPGCL
NWPGCL has inadequate manpower. While its staffing level is adequate for its current operations, in light of its development and expansion goals, it needs to increase the number of staff and provide adequate training.	M	NWPGCL is preparing a long-term human resource and training plan for 2018-2022, in line with the capacity expansion plan.	NWPGCL
The PPA between NWPGCL and BPDB may not be executed on schedule.	M	The PPA initiated by parties will be provided to ADB for review before the loan agreement is signed, and ADB will provide comments on the initiated PPA. The executed PPA will be provided to ADB before the commercial operation date of the project.	NWPGCL
Delays in payments of capacity charges and fuel costs by BPDB would impact servicing of project debts and payments for fuel.	M	Payment securities such as standby letters of credit as well as interest payments for delayed settlement of invoices will be included in the PPA.	NWPGCL and BPDB
Increases in prices of commodities and raw materials in the international market above projections and contingencies could result in cost overrun and delay project completion.	S	The capital expenditure estimates are benchmarked to recent similar projects in Bangladesh. Additionally, adequate physical and price contingencies have been provisioned in the project cost.	NWPGCL
<b>Procurement, Implementation, and Operation</b>			
Gas supply line construction may be delayed, causing non-availability of fuel for the first firing of the gas turbine.	L	Initial firing of the gas turbines may be done with diesel, allowing them to operate on diesel, and the gas pipeline can be completed while the steam turbines and heat recovery equipment are being installed.	NWPGCL
Construction of the transmission interconnection may be delayed because of problems with right-of-way and the completion schedules of the Khulna (south)–Mongla transmission line, with which the Rupsha–Khulna (south) transmission line will share the	M	Early action will be taken to ensure the right-of-way is cleared to enable the transmission line to be ready for the first firing of the gas turbine. Progress of the Khulna (south)–Mongla line construction will be closely monitored.	NWPGCL and PGCB

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support structures over its final 4 km into Khulna (south) substation.			
Non-availability of natural gas to operate the Rupsha power plant due to delays in liquefied natural gas imports.	S	Infrastructure to import liquefied natural gas is under construction, and the government has given written assurance to allocate gas for the Rupsha power plant. The government has already signed an agreement to import gas, which is expected to be available within 2018, 2 years ahead of commissioning of the first gas turbines of the Rupsha power plant.	Petrobangla
<b>Project Technical Performance</b>			
Power plant availability below the PPA target would affect project revenues.	L	Best practices recommended by manufacturers will be followed, including timely inspections and repairs.	NWPGCL
Power plant fuel efficiency may be below the level stipulated in the PPA, causing up-front and recurrent financial losses.	M	Power plant efficiency guarantees, and corresponding liquidated damages will be passed on to the EPC contractor, and maintenance best practices will be followed to ensure fuel efficiency does not deteriorate further.	NWPGCL
Power transmission system constraints will cause the Rupsha power plant to underutilize its capacity.	S	The required infrastructure to evacuate power to the existing substation will be financed by the project. The remaining transmission system strengthening is included in the power grid company's development plans, and it is being financed by development partners, including ADB, through regular lending programs.	PGCB and MPEMR
Interruptions to gas supply to the power plant may force the power plant to operate on diesel, invoking the provisions of the PPA.	M	Adequate stocks of diesel will be maintained on-site, and the power plant will be kept in readiness to operate on diesel.	NWPGCL
<b>Achieving Targets</b>			
Delays in construction of the power plant and the transmission and distribution lines may affect the government's target of achieving universal access to electricity by 2021.	M	Power distribution utilities will ensure their ongoing projects are completed on schedule and examine any remaining locations unserved by the planned distribution expansion projects. The government and power sector utilities will work closely with bilateral and multilateral development partners to achieve targets.	All distribution utilities, PGCB, BPDB and MPEMR
Gas transmission network strengthening in the longer term may	M	The gas transmission network will be upgraded to meet (i) the	GTCL and SGCL

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be delayed, causing pressure drops in the supply to power plants.		demand growth and (ii) the need to transfer imported gas from coastal points of delivery to locations in the interior.	
<b>Sector Sustainability</b>			
Power generation capacity additions countrywide do not proceed as planned, resulting in shortages.	M	Implementation status of generation projects, including receipt of clearances, fuel sourcing, financing, and execution, is regularly monitored.	MPEMR
There is a significant difference between costs and bulk supply tariffs for sale by BPDB to distribution.	M	The addition of low-cost power sources to replace expensive liquid fuels, coupled with actions taken toward meeting loss reduction targets and periodic bulk tariff revisions, will improve sector sustainability.	MPEMR, BERC and BPDB
Governance, anticorruption, and financial management.	M	ADB is supporting the government in implementing governance reforms, including supporting the Anti-Corruption Commission, separating the judiciary from the executive branch of the state, improving grievance redress mechanisms in the line ministries, enacting laws on money laundering and the right to information, and ratifying the United Nations convention against corruption. ADB is also working with the government to strengthen support for public financial management and to develop capacity for planning, policy-making, and procurement.	ADB/MPENR

ADB = Asian Development Bank, BERC = Bangladesh Energy Regulatory Commission, BPDB = Bangladesh Power Development Board, EPC = engineering, procurement, and construction, ERP = enterprise resource planning, GTCL = Gas Transmission Company Limited, km = kilometer, L = low, M = moderate, MPENR = Ministry of Power, Energy and Mineral Resources, NWPGL = North-West Power Generating Company Limited, Petrobangla = Bangladesh Oil, Gas and Mineral Corporation, PGCB = Power Grid Company of Bangladesh Limited, PPA = power purchase agreement, S = substantial, SGCL = Sundarban Gas Company Limited.  
Source: ADB estimates.