Bangladesh: Bangladesh–India Electrical Grid Interconnection Project
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Description
In 2009, Bangladesh experienced a power crisis with a deficit of about 1,700 megawatts (MW) resulting in frequent power cuts and voltage fluctuations. This situation negatively impacted industrial output and generated public dissatisfaction. To address the situation, the government decided in the short-term to permit installation of rental power plants and increase gas allocations to power generation plants by reducing gas allocations to fertilizer plants. Longer-term measures included setting up of larger and more efficient power plants and importing power from neighboring countries. In January 2010, the governments of Bangladesh and India agreed to set up a power interconnection between the western grid of Bangladesh and the eastern grid of India to facilitate a transfer of 500 MW from the Indian side. The Government of Bangladesh sought the Asian Development Bank's (ADB) assistance for the interconnection project within Bangladesh and a loan was processed for approval in 2010.1 The technical assistance (TA) was approved in 2010 to provide support on formalizing the power purchase agreement (PPA) as well as supporting safeguard implementation and reviews.

Expected Impact, Outcome, and Outputs
The impact of the project was sustained inclusive growth in Bangladesh through optimal utilization of power generation capacity in the South Asian region. The outcome was the successful operation of a long term power transmission link between Bangladesh and India. The outputs of the TA were (i) development of an interconnection, operation, and power purchase agreement between Bangladesh and India; (ii) selection of a power supplier of up to 250 MW of power on a competitive basis from India; (iii) capacity development in planning, development, operation and maintenance of power interconnection and power trading; and (iv) implementation of safeguards in accordance with ADB Safeguards policy.

Delivery of Inputs and Conduct of Activities
Based on due diligence in 2010, disbursements from ADB under the Bangladesh–India Electrical Grid Interconnection Project loan could commence only on the successful completion of a memorandum of understanding (MOU) between the electricity seller in India and the electricity buyer in Bangladesh. This MOU would be followed with the timely signing of a PPA for the transfer of electricity. Advance procurement of ADB loan funded contracts commenced in 2010 and the two turnkey contracts for the high voltage direct current sub-station and transmission line were signed in 2010 and 2011. Delays in signing the MOU resulted in construction work commencing using counterpart funding for advance payments in place of planned ADB funding.

After several meetings between representatives of both countries, an understanding was reached and the electricity seller in India [the National Thermal Power Corporation (NTPC) Vidyut Vyapar Nigam Limited (NVVN)] and the buyer in Bangladesh [Bangladesh Power Development Board (BPDB)] signed a PPA for 250 MW of power transfer in March 2012. The two utilities decided to sign the PPA directly without the need to enter into an MOU. Following this, ADB disbursement commenced in 2012. By this time, the interconnection agreement between BPDB and Power Grid Corporation of India Limited (PGCIL) had been signed.

In 2010, five consultants were to be recruited under the TA namely: an international interconnection agreement specialist, an international legal specialist, an international trading specialist, and two national safeguards specialists for a total of five person-months of international consultants and four person-months of national consultants. The terms of reference (TOR) were adequately formulated to achieve TA objectives. Based on a re-assessment of the requirements under the TA in 2012 after signing of the interconnection agreement, only three consultants—an international trading specialist, a national environment safeguard specialist and a national resettlement safeguard specialist were recruited. The trading specialist TOR was enhanced to include a review of the options for BPDB to procure power from the Indian

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1 ADB, 2010. Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People’s Republic of Bangladesh for the Bangladesh–India Electrical Grid Interconnection Project. Manila. (A loan of SDR65,986,000 supported the financing of the high voltage direct current sub-station and transmission line in Bangladesh).
power market. A two-stage bidding for a short-term three year PPA followed by longer term PPA was proposed to generate competition for the bid and resulted in two offers for the short-term PPA in 2013 and seven offers in 2015 for the longer term PPA. Key issues relating to BPDB procuring power from the Indian power market such as the duration of power purchase, structure of power purchase agreements, and open access approvals for power traders were assessed to develop the bidding documents and the PPA. The consultant successfully supported BPDB over the tendering process and a PPA was signed for 250 MW between the seller of power in India and BPDB in 2013.

The national safeguard specialists were deployed in 2012 and reviewed the activities undertaken by the executing agency and contractors from contract award until 2012 through independent surveys, site visits and discussions with the affected people. They confirmed that the project was implemented in accordance with the ADB Safeguard Policy Statement requirements and also provided recommendations to the executing agency on further activities. These recommendations were followed up during review missions and implemented by the executing agency.

The TA completion date was extended to 31 December 2014 for a cumulative of 32 months on periodic requests from the Government of Bangladesh in 2013 and 2014 to continue the support. The services were rendered efficiently and effectively by the consultants to achieve the TA outputs and their performance was highly satisfactory. The Power Division of the Ministry of Power, Energy and Mineral Resources and the Power Grid Company of Bangladesh (PGCB) and the Independent Power Producer Cell of the BPDB provided office space, logistics, and counterpart support and their performance was satisfactory. ADB supervised TA activities and outputs with consultants and government agencies, undertook visits combined with other missions to Bangladesh, provided guidance on the preparation of TA reports and coordinated with the government on key identified issues for follow up action. The overall performance of ADB was satisfactory.

**Evaluation of Outputs and Achievement of Outcome**

The TA achieved its planned outcome and outputs. As indicated, the bulk power transmission agreement between PGCIL and BPDB were negotiated and signed in 2010. PGCIL designed, financed, constructed and operated the transmission line from Baharampur in West Bengal to the India–Bangladesh border with a capacity for 1,000 MW of power flows. Also, the first power purchase of 250 MW was signed between the two countries directly in 2012.

The TA supported the first cross-border commercial power bid process between India and Bangladesh. The bid process could start only in 2012 once clearances were received from the Government of Bangladesh on the conclusion of the first PPA for 250 MW between NVVN and BPDB in March 2012. A report on options for commercial power trading was presented to BPDB and the Power Division in 2012. After receiving government clearance, bid process was initiated that resulted in a successful contracting of 250 MW of power on a competitive basis from a supplier in India in 2013. A workshop on the power market in India and on cross border power trading was also conducted in September 2013 where stakeholders from BPDB, Power Division, PGCB and other sector entities participated along with ADB to build capacity and familiarity with power markets.

The national safeguard consultants reviewed PGCB performance on environmental and involuntary resettlement in accordance with ADB Safeguard Policy and the information provided in the quarterly progress reports by PGCB. They undertook independent surveys to verify payments made to displaced persons and provided corrective advice to the executing agency project team on maintenance of environmental and resettlement standards on the site as well as the payment of replacement value to private land losers. They also recommended carrying out livelihood training programs. Recommendations received were acknowledged and subsequently complied with by PGCB.

Power flows of 500 MW commenced in 2013 from India to Bangladesh and in 2015, the same transmission line is now being planned for increasing the power transfers between the two countries from 500 MW to 1,000 MW by 2018. The outcome for successful operation of a long term power transmission link is achieved.

**Overall Assessment and Rating**

The TA activities commenced only in 2012. While this did impact the efficiency of the TA, the TA met its outputs and its outcome for operation of a successful power interconnection link between Bangladesh and India and is rated successful. The TA outcome is sustainable and this is visible in terms of the follow-up project. Another tender for 500 MW is being planned for in 2015 for the new interconnection under the proposed SASEC Second Bangladesh–India Electrical Grid Interconnection Project.

**Major Lessons**

The successful implementation of the first major grid to grid interconnection between India and Bangladesh has created opportunities for several more such interconnections in the region. South Asian countries have signed an energy trading framework agreement in November 2014 to facilitate development of energy generation resources to meet demand in
the region. Institutions such as the Joint Steering Committee comprising the Power secretaries of the two countries and the Joint Working Group comprising power utility personnel played an important role in the timely design and implementation of the project.

**Recommendations and Follow-Up Actions**

Several multi-country energy sector cooperation projects including between India, Bangladesh, Nepal and Bhutan are in different stages of discussions. ADB and other development partners continue to support the review of options for additional interconnections as building blocks for a south Asian regional electricity grid.

Regionally, ADB is supporting the SASEC Electricity Transmission Utility Forum that will, among other things, support the harmonization of interconnection standards between south Asian countries. In Bangladesh, particularly as the proportion of regional energy projects increases in the generation portfolio over time, there is a need to set up and build capacity for a power trading agency (or an arm of the existing single buyer) to effectively participate in the regional market and optimize costs given seasonal, weekly and time of day variations in the region.

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