I. Introduction and Context

Country Context

Bangladesh, with a population of about 150 million and a land area of 147,570 square kilometers, is amongst the most densely-populated countries in the world. The country is vulnerable to natural disasters and extremely sensitive to climate change impacts. Despite the challenges, Bangladesh has managed to graduate to a higher growth trajectory and maintain an average GDP growth rate above 6 percent in recent years. Rural Poverty has fallen substantially from 40 percent in 2005 to 31.5 percent by 2010, keeping Bangladesh on track to meet the Millennium Development Goal of halving extreme poverty by 2015.

Infrastructure deficits in a number of areas but especially in energy are emerging as the main threats to maintaining the GDP growth rate in Bangladesh. In the latest Investment Climate Assessment (ICA), the highest number of firms (78%) expressed their concern about the lack of adequate power. Access to electricity in Bangladesh is about 55% and the per capita electricity consumption of about
236 kWh per year is one of the lowest in the world. Only about 40% of rural households have access to electricity with about 13 million households yet to be electrified. Even those with access to electricity experience supply disruptions because the peak electricity demand in the country is about 8,000 MW and available generation capacity of about 6,500 MW is insufficient to meet demand. Natural gas is the primary fuel for more than 75% of power generation, which itself is in short supply.

**Sectoral and Institutional Context**

Recognizing the challenges, the Government of Bangladesh (GOB) has adopted a multi-pronged strategy in the power sector that includes energy conservation, load management, adopting grid and off-grid electrification approaches to extend electricity services, promoting private sector investment in short and longer-term power supply measures, and improving sector governance and efficiency. The GOB articulated a Vision and Policy Statement on Power Sector Reforms in 2002, which includes the objectives of: i) universal access by the year 2021 with improved reliability and quality; ii) stabilizing the sector’s financial status and increasing its efficiency; and iii) operating the sector on commercial principles and increasing private sector participation.

The Bangladesh power sector reform first started in 1978 with the creation of the Rural Electrification Board (REB) and the rural cooperatives (Palli Biddyut Samities, PBSs). REB was created as the apex body responsible for planning, financing, and installation of the rural electrification network of the country. Once constructed, the distribution lines are transferred to the PBSs, which are responsible for retail service provision as well as the operation and maintenance of the system. PBSs are managed by professionals with oversight from their own boards consisting of consumer representatives while REB also has a strong oversight over the performance of PBSs through Performance Target Agreements. This REB/PBS model has gained global recognition as one of the most successful rural electrification programs in the world. The program currently manages about 270,000 km of distribution lines (33kV and below) and accounts for almost half of country’s power demand connecting about 8 million rural households. The average systems losses in the PBSs are in the range of 14% with potential for reducing them to a comparable rate of the other corporatized distribution utilities through investments in rehabilitation and augmentation. Since 1981, the Bank has been supporting the REB/PBS program with the most recent project supporting area rationalization program of GOB by transferring pocket/peri-urban areas from the Bangladesh Power Development Board (BPDB) to the PBSs, in addition to supporting grid expansion.

Despite the successes and achievements of the rural grid however, the institutional capacity of REB/PBSs have not kept pace with the rapid acceleration in grid expansion. The financial position of the PBSs also deteriorated due to inadequate adjustments in retail tariff. Generation shortages, which are beyond the control of REB/PBSs, have further contributed to the weak financial position. A Bank-supported study in 2009 identified the problems, and the Bank has been engaged in an extensive dialogue with the GOB in support of home grown solutions. Realizing the need for strengthening the REB/PBS program to meet the challenges of universal access by 2021, a reform action plan has been developed by REB with proposals for strengthening REB Board with professionals, delegation of authority to the PBSs, and establishing zonal offices of REB to better interface with the PBSs. Several initiatives have already been taken by the GOB including putting professionals in the top management positions of REB, signaling a strong commitment from GOB for strengthening REB/PBSs. The proposed Project is expected to provide support for implementation of the reform action plan.
The power sector reform program resulted in the un-bundling of vertically integrated BPDB into several generation companies, one transmission company, and a number of distribution companies for the major urban centers. The Power Grid Company of Bangladesh (PGCB) was formed in 1996 as a government owned company to manage the country’s high voltage transmission network of 132kV and above. PGCB currently owns and operates 2,600 km of 230 kV lines and 6,000 km of 132 kV lines, and transmits power from the single-buyer BPDB to the 70 PBSs under REB and other distribution utilities. PGCB receives wheeling fees for this service. PGCB has a sound governance structure with a board of directors providing oversight to professional management running the company’s day-to-day operations.

To address the power generation shortages, GOB has embarked upon an ambitious generation expansion plan that envisages adding more than 11,500 MW to the national grid by the year 2015. As part of that plan, a number of large gas-fired power plants have recently been awarded to the private sector and one large coal fired plant (1,320 MW) has been undertaken in the public sector. As these large power plants will take time to commission, as an interim measure, GOB has contracted over 2,300 MW of plants run on liquid fuel for 3-5 year terms. While helping to reduce the power shortages, these high-cost short-term power plants however have caused huge fiscal burden on GOB. Despite increasing the bulk supply tariff (BST) (at which the off-taker BPDB sells power to the distribution utilities) by about 80% in phases since February 2011, the subsidy by GOB (to meet the gap between bulk supply tariff and the cost of power purchases by BPDB) was BDT63 billion (US$800 million) in FY12 up from BDT40 billion (US$550 million) in FY11. Such subsidy was in the range of US$85 million per year during FY07-09 and US$140 million in FY10. In FY13, the subsidy amount is expected to be BDT 50 billion (US$625 million) to cover the shortfall in power purchase costs.

To aggravate the situation, the increase in BST are not passed on to the consumers in time, causing financial burdens on the distribution utilities, especially the PBSs. Between 2002 and 2008, retail tariff charged by the PBSs were not allowed to increase although the BST was increased by about Tk 0.34/kWh in 2007. In October 2008, the BST was increased by Tk 0.15/kWh but the commensurate increase in retail tariff was made effective from December 2008. Between February 2011 and September 2012, the BST increased by Tk 1.56/kWh in phases while the average revenue rate of the PBSs increased by only Tk 1.53/kWh during the same period. Even after the 15% increase in tariff in September 2012, the aggregate cost of power supply of all the PBSs is Tk 6/kWh against the average revenue rate of Tk 5.43/kWh. This translates into an annual deficit of about Tk 440 million (US$55 million). PBSs are resorting to delayed debt service to REB to cover the deficit.

In the long run, GOB expects the cost of power generation to come down gradually with the large power plants starting operations replacing the costly liquid fuel plants, thus lowering the BST at which the utilities are required to purchase power. While the generation capacity additions will take time to materialize, the rural grid network needs investments now for rehabilitation and augmentation so that more power from the existing generation capacity could be reached to rural consumers while making the system ready for future expansion when additional power generation is available.

**Relationship to CAS**
The proposed Project is consistent with the Country Assistance Strategy for FY11-14, which states,
“As one of the country’s largest development partners, the Bank will increasingly invest in transport and power infrastructure that can transform lagging areas of the country, create agglomeration economies in urban areas and foster broader regional networks. In the power sector, this will include support for new generation, rehabilitation, expansion of transmission capacity and enhancing the natural gas supply for power and other applications.” The proposed Project would contribute to outcome 1.3 under CAS Pillar 1 (increased infrastructure provision, access and efficiency).

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)
The proposed project development objective is to improve the reliability and quality of supply of electricity to rural consumers in Bangladesh through improvements in technical efficiency of the rural distribution system.

Key Results (From PCN)
- Reduction in technical losses in the Project PBSs
- Reduction in transmission losses in the Project area
- Improved financial performance of the Project PBSs

III. Preliminary Description

Concept Description
The proposed Project is expected to support the rehabilitation and augmentation needs of the 33/11 kV network operated by the PBSs, transmission enhancement needs of PGCB, and capacity building of REB, the PBSs and PGCB as well as implementation of the reform action plan for REB/PBSs. With the expansion in the 33/11 kV network operated by the PBSs over the years, many distribution lines were extended long distances away from the substations resulting in poor voltage profiles and high system losses, particularly where the load has grown over time. PBSs are finding it difficult to serve some of the outlying areas due to the long distances from grid substations. To address these problems a 33/11 kV network development study was undertaken by an international consultant with support from local consultants under the IDA-financed Rural Electrification and Renewable Energy Development (RERED) project. The study identified the need for new 33/11 kV lines and substations. The study also developed a low-cost design for 132/33 kV substations to be operated by PGCB to supply to the rural grid of the REB/PBSs.

The proposed Project is expected to cover the 33/11 kV system designs that were identified in the 33/11 kV study including rehabilitation requirements identified by REB. The distribution system expansion philosophy is based on the objectives of reducing losses, improving quality of supplies, and increasing reliability of systems. This will require upgrading conductors, additional lines, new substations as well as reinforcing existing substations.

The proposed Project will also include transmission components by PGCB to address critical bottlenecks in the 132 kV network supplying REB areas. PGCB has reservations for the full scale adoption of the proposed low-cost 132 kV network design on the grounds of grid reliability and safety, but it agreed to pilot a low-cost 132 kV line and substation, which is also expected to be supported under the proposed Project.

The preliminary cost estimates for the proposed Project is US$680 million, out of which IDA
requirement is US$580 million. Following are the proposed components.

A. Rural Grid Augmentation and Rehabilitation (US$512 million, IDA US$455 million): The proposed Project is expected to support the augmentation and rehabilitation needs of 37 PBSs in the eastern part of Bangladesh (Dhaka, Chittagong, and Sylhet Divisions). The proposed investment will reduce systems losses while improving reliability and quality of supplies. The proposed physical targets under the component are summarized below:

- 33 kV new line - 2,660 Kilometers
- 33 kV Line Upgradation - 907 Kilometers
- 11 kV new line - 2,368 Kilometers
- New Substations - 110 Nos

B. Transmission enhancement (US$158 million, IDA US$115 million): The 33/11 kV network development study identified 13 grid (132/33 kV) substations that will be needed for the rural distribution network in the project areas. Out of these 13 substations, 6 are included in the proposed Project to be implemented by PGCB. One of these substations will be piloted as per the low-cost design suggested under the study. PGCB has also identified a few priority investments in the 132 kV network to remove the bottlenecks and cater to the growing load in the PBS areas, which will be supported under the proposed Project. The proposed physical targets under the component are summarized below:

- 132 kV new line - 108 Kilometers
- Re-conductoring - 247 Kilometers
- New Substations - 6 Nos.

C. Technical Assistance Support to REB and PGCB (US$10 million): Various technical assistance needs are envisaged—tariff study for ensuring financial sustainability of the PBSs, training and capacity building activities for both REB and PGCB, identifying the scope of implementation of the Geographic Information System (GIS), inventory management etc. This will also include implementation support for the REB/PBS reform action plan. The technical assistance design is expected to allow for the flexibility in extending support as and when needs arise.

IV. Safeguard Policies that might apply

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V. **Financing (in USD Million)**

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