

**PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE**

Report No.: PIDC383

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| Project Name | Rural Electrification and Renewable Energy Development II (RERED II) Project (P131263) |
| Region | SOUTH ASIA |
| Country | Bangladesh |
| Sector(s) | Other Renewable Energy (78%), General energy sector (12%), Energy efficiency in power sector (10%) |
| Lending Instrument | Specific Investment Loan |
| Project ID | P131263 |
| Borrower(s) | People's Republic of Bangladesh |
| Implementing Agency | Infrastructure Development Company Limited (IDCOL), Power Cell, Rural Electrification Board |
| Environmental Category | B-Partial Assessment |
| Date PID Prepared | 18-May-2012 |
| Estimated Date of Appraisal Completion | 00000000 |
| Estimated Date of Board Approval | 13-Sep-2012 |
| Concept Review Decision | Track II - The review did authorize the preparation to continue |

I. Introduction and Context

Country Context

1. A large segment of the population of Bangladesh has little or no access to electricity or to clean modern energy sources. Access to electricity is less than 50% and the per capita electricity consumption of about 236 kWh per year is one of the lowest in the world. Only about one-third of rural households have access to electricity with about 16 million households yet to be electrified. Even those with access to electricity experience supply disruptions due to supply-demand gap. The peak electricity demand in the is about 6,500 MW and available generation capacity of 4,600 to 5,200 MW. Natural gas is the primary fuel for more than 80% of power generation, which itself is in short supply. Renewable energy currently constitutes less than 1% of total power generation in the country. About 90% of the more than 30 million households in Bangladesh rely on traditional fuels for cooking representing a significant public health hazard.

2. 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 2020 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.

3. The Renewable Energy Policy (2008) of GOB laid out the target of meeting 5% of total power demand from renewable energy sources by 2015 and 10% by 2020. The Remote Area Power Supply Systems (RAPSS) guideline of 2007 allows for private sector participation in development, operation, and maintenance of electricity generation system and distribution networks in remote rural areas including isolated islands to supplement GOB efforts at achieving universal access by 2020. However, beyond the successful solar home systems (SHS) program, there have been little renewable energy generation investments made since the policy was announced. GOB is preparing the legislation to establish a Sustainable and Renewable Energy Development Agency (SREDA) as an autonomous body to lead its efforts in promoting renewable energy and energy efficiency in the country.

4. As part of its efforts to reduce the existing demand-supply gap, GOB has embarked upon the Efficient Lighting Initiatives of Bangladesh (ELIB) program with the World Bank support to replace incandescent lamps with energy efficient Compact Fluorescent Lamps (CFLs). The first-phase distribution of 10 million CFLs has been completed, though there are problems related to product quality. The second-phase distribution of another about 7 million is being planned, including actions to overcome quality issues.

5. Despite all the short and long-term efforts at increasing power generation and demand side management, it will take years to fully close the demand-supply gap. Consequently, it will not be possible to achieve the government vision of universal access by 2020 relying only on the grid. Furthermore, the dispersed nature of rural settlements and the numerous rivers that crisscross the country make grid electrification in many areas difficult and expensive. Off-grid renewable energy is the only near-to-medium-term option left for millions of people in the remote areas of the country.

8. The Solar Home Systems (SHS) program of Bangladesh supported by the Bank has emerged as a viable electrification option for lighting and other basic services in remote rural areas without grid access. The potential market for SHS is about 6 million households and businesses. The SHS program started in 2003 with an initial target to install 50,000 SHS over the 5-year project period under the on-going Rural Electrification and Renewable Energy Development (RERED) project. The program has far

exceeded its goals. It is currently installing 40,000 systems per month making it one of the fastest growing SHS programs in the world. Together with support from the Bank and other development partners, the program has installed more than 1.3 million SHS in rural off-grid areas, contributing to increasing access to electricity by 4%. Continuing with the successful installation of the SHS, the target is to reach another 1.3 million in the next two years, requiring support from the Bank and other development partners.

9. In addition to the SHS program, the on-going Bank support has piloted three renewable energy-based mini-grid schemes for providing access to electricity in selected off-grid remote areas. Under the schemes, private operators identified the least-cost technology options (solar photovoltaic, biomass gasifier) for providing grid quality electricity in the selected locations. They invested equity in these schemes (along with a mix of credit and grant support) and are currently operating these systems on a fee-for-service basis, providing electricity services to residential and business customers. GOB plans to scale-up these types of schemes under the scope of the RAPSS guidelines.

10. The transition to modern, clean cooking fuels like natural gas, liquefied petroleum gas (LPG), and to some extent electricity, will take a long time, as access to these fuels are limited, and the appliances to use them are not affordable to the poor. Improved cook stoves (ICS) are the transitory options for the majority of the poor along with biogas for families with cattle. An ICS with chimney: (i) reduces indoor air pollution, thereby reducing exposure levels to health-damaging pollutants; (ii) could save up to 50 percent of the traditional biomass fuels used; (iii) reduces CO₂ emissions and the resultant greenhouse effects; and (iv) helps conserve forest resources.

11. Despite a number of efforts to introduce ICS in Bangladesh since 1980s, only about 2 percent of the population relying on traditional fuels has access to ICS. A recent study has explored options for developing a large-scale ICS program to reduce exposure to indoor air pollution in Bangladesh. A recent study shows that a sustainable ICS program in Bangladesh should be based on a market-driven model that would allow for the growth of entrepreneurs and micro-enterprises through intensive training and capacity building. The recent mobilization on clean stoves and fuels through the Global Alliance for Clean Cookstoves (GACC) and the United Nations Sustainable Energy for All Initiative offers a unique opportunity that Bangladesh should explore to scale up the dissemination of clean cook stoves and fuels.

Sectoral and Institutional Context

12. A number of key public, private, and non-government organizations (NGOs) play a key role in off-grid electrification, including the SHS program, the household energy program, and the ELIB program. The Infrastructure Development Company Limited (IDCOL) is responsible for the renewable energy program. The Rural Electrification Board (REB) is responsible for procurement of CFLs under the ELIB program. Power Cell at the Ministry of Power, Energy and Mineral Resources (MPEMR) is responsible for supporting sector reform activities. SREDA, once operational, will be leading the policy developments in renewable energy and energy efficiency.

13. IDCOL, a government owned infrastructure finance company, has been implementing the Bank-supported SHS and other renewable energy programs under the RERED project since 2003. The SHS program is a public-private partnership model where the Partner Organizations (POs) (mostly NGOs) procure and install the systems as per technical standards set by IDCOL. Consumers sign SHS purchase contracts under a micro-finance scheme with the POs. After the systems are installed, the POs apply for re-financing from IDCOL for a portion of the microfinance they extended to the households. After technical and other verifications, IDCOL releases the credit and a fixed subsidy (currently \$28 per system) to the POs. This refinancing provides the POs with funds to install more systems and reach even more remote areas. The PO selection committee of IDCOL selects the POs as per the eligibility criteria. Starting with 5 POs, the program now has 29 POs, and IDCOL expects to engage more POs as part of its goal of achieving a commercially sustainable competitive market for SHS in Bangladesh. IDCOL is also channeling funds to the private sector for the renewable energy based mini-grids and solar irrigation schemes under the on-going RERED project. IDCOL has also been implementing the national domestic biogas program providing for clean fuel options for cooking and lighting purposes.

14. GOB is establishing SREDA as a statutory policy and resource mobilization agency for promoting renewable energy and energy efficiency in Bangladesh. The necessary legislation has been drafted, and as an interim measure, a small cell within the MPEMR has been established to initiate the preliminary activities of SREDA. Once fully operational, SREDA is expected to be the coordinating agency for the national household energy program.

15. The Rural Electrification Board (REB) is implementing the CFL component under the ELIB program. REB is the apex body responsible for planning, financing, and installation of the rural electrification network of the country. The CFLs are procured by REB and are given to the distribution utilities and the rural cooperatives (Palli Bidyut Samities or PBSs) for distributing to the households in exchange for incandescent lamps. The program is registered under the Clean Development Mechanism (CDM) for claiming carbon credits with IDCOL as the Coordination and Managing Entity (CME).

16. Power Cell, a technical arm of the Power Division of MPEMR, provides technical assistance for design and implementation of power sector reform activities. In support of this service to the sector, the Power Cell has been receiving technical assistance funding through the ongoing Bank-supported Power Sector Development Technical Assistance (PSDTA) project, which is scheduled to close in December 2012.

Relationship to CAS

17. The proposed Project is consistent with the Country Assistance Strategy (CAS) for FY11-14, and would make a positive contribution to human services through increased access to electricity in hard-to-reach areas and to Bangladesh's climate change agenda through the expanded use of renewable energy. Specifically, the proposed Project would contribute to achievement of outcome 1.3 under CAS Pillar 1 (increased infrastructure provision, access and efficiency) and outcome 2.3 under CAS Pillar 2 (reduced environmental degradation and strengthened natural resources management).

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The proposed project development objective is to increase access to modern, reliable energy by households and enterprises in rural areas through renewable energy and improve the response capacity of the borrower in case of an emergency.

Key Results (From PCN)

21. Results will be measured as:

- number of households and enterprises getting access to electricity through renewable energy sources;
- number of higher performing cook stoves adopted by households;
- number of CFLs distributed in exchange of incandescent lamps;
- establishment of a functional Sustainable and Renewable Energy Development Agency (SREDA) for promoting renewable energy and energy efficiency

III. Preliminary Description

Concept Description

In support of the vision of the Government of Bangladesh (GOB) of providing universal access to electricity by the year 2020, the proposed project would support the Solar Home Systems (SHS) and mini-grid options for providing access to electricity in areas where grid electricity is difficult, expensive, and will take years to reach. In continuation of the Bank support to the successful SHS program of GOB, the proposed project would extend support for another 550,000 systems following the same model and institutional arrangement as has been proven successful under the on-going Rural Electrification and Renewable Energy Development (RERED) project.

The proposed project would also support GOB's efforts of implementing renewable energy based mini-grids through the private sector in rural areas as stipulated under the Remote Area Power Supply Systems (RAPSS) guidelines. The RAPSS component would be based on the least cost option (solar photovoltaic, biomass gasifier etc) for the consumers building on the lessons learned from the pilots supported under the on-going RERED project. Providing grid-quality electricity from renewable energy sources in the RAPSS areas will serve the commercial needs of the rural markets and small enterprises, where the potential consumption of electricity is much higher than the basic lighting and electricity needs of a typical rural household that could otherwise be met by SHS. Identifying areas where such mini-grids are the least cost option, GOB plans to offer licenses through a competitive process for owning and operating the RAPSS schemes.

The proposed project would contribute towards increasing access to modern energy by scaling up adoption of more efficient cook stoves. The proposed household energy component would build on activities currently being undertaken by a number of NGOs and aims towards a scaling up of improved cook stove production, dissemination, and sustained use. The proposed component would include: (i) awareness raising and community outreach, to ensure potential users are aware of the fuel saving and health benefits of higher performing cook stoves (i.e improved cook stoves and possibly advanced cook stoves in urban areas); (ii) research and development to enhance product quality, performance, safety and durability; (iii) setting up of performance standards, labels and testing facilities; (iv) design of an operational funding facility to support initial capital costs for large-scale stove production and distribution facilities; and (v) development of innovative and pragmatic funding procedures to attract new players into the sector, capitalizing on carbon finance and using a blend of loans and grants.

In addition, the proposed project would support implementation of the second phase of the Compact Fluorescent Lamp (CFL) component with the objective of introducing more efficient energy consumption.

Finally, the proposed project would provide continued technical assistance for sector reform and capacity building.

Given the country's vulnerability to natural disasters, the proposed project would include a contingent component with zero allocation to allow for the flexibility of a rapid response in the event of an emergency. Should an emergency occur, the proposed project would finance public and private sector expenditures on a positive list of goods, both domestic and imported, required for the Borrower's emergency recovery program.

IV. Safeguard Policies that might apply

| Safeguard Policies Triggered by the Project | Yes | No | TBD |
|---|-----|----|-----|
| Environmental Assessment OP/BP 4.01 | X | | |

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| Natural Habitats OP/BP 4.04 | | X | |
| Forests OP/BP 4.36 | | X | |
| Pest Management OP 4.09 | | X | |
| Physical Cultural Resources OP/BP 4.11 | | X | |
| Indigenous Peoples OP/BP 4.10 | | X | |
| Involuntary Resettlement OP/BP 4.12 | | X | |
| Safety of Dams OP/BP 4.37 | | X | |
| Projects on International Waterways OP/BP 7.50 | | X | |
| Projects in Disputed Areas OP/BP 7.60 | | X | |

V. Tentative financing

| Financing Source | Amount |
|--|--------|
| BORROWER/RECIPIENT | 0.00 |
| International Development Association (IDA) | 155.00 |
| US Agency for International Development (USAID) | 7.60 |
| Global Partnership on Output-based Aid | 5.50 |
| GERMANY KREDITANSTALT FUR WIEDERAUFBAU (KFW) | 13.00 |
| LOCAL BENEFICIARIES | 30.00 |
| Non-Government Organization (NGO) of Borrowing Country | 61.00 |
| Financing Gap | 16.90 |
| Total | 272.10 |

VI. Contact point

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