

Energy Efficiency and Grid Integration of Renewable Energy (EEGIRE II)

Background

The Bangladesh Government has fulfilled its commitment of ensuring energy access for all citizens. The nation now has 25 gigawatts (GW) of installed capacity, compared with a peak consumption of more than 15 GW. Despite the sufficiency in electricity supply, there are still voltage and frequency fluctuations in the power grid. According to official data, system loss has been significantly reduced in recent years. However, technical issues in the power supply system continue to occur, especially in rural areas and the urban periphery. More variable renewable energy (VRE) based power plants are planned to be commissioned in near future and a nuclear power plant is also expected to be connected to the national grid. In this scenario, grid management capacity will be a concern for the sector.

The grid infrastructure and management are facing additional challenges with the growing number of electric vehicles (EVs) (primarily battery-powered rickshaws) as well as the integration of power from fluctuating renewable energy sources (mainly solar power) into the existing grid. A major barrier for stakeholders to integrate solar power into the electrical grid and improve efficiency are inadequate general and technical framework conditions.

Germany and Bangladesh have collaborated in the priority area of renewable energy and energy efficiency since 2004. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is currently implementing the project “Energy Efficiency and Grid Integration of Renewable Energy (EEGIRE II)” to improve the electrical grid management capacity of the country as well as to enhance the readiness of the grid for integration of decentralised renewable energy resources, such as, solar PV.

Project name	Energy Efficiency and Grid Integration of Renewable Energy (EEGIRE II)
Commissioned by	German Federal Ministry for Economic Cooperation and Development (BMZ)
Commission value	3.4 Million Euro
Project region	Bangladesh
Partner ministry	Ministry of Power, Energy, and Mineral Resources (MPEMR)
Executing agency	Power Division (MPEMR); West Zone Power Distribution Company Limited (WZPDCL); Dhaka Power Distribution Company Limited (DPDC); Power Grid Company of Bangladesh (PGCB)
SDG contribution	Affordable and Clean Energy (SDG-7), Climate Action (SDG-13)
Duration	2021-2024

Objectives

The objective of this technical cooperation project is to “increase the integration capacity of the grid for decentralised renewable energy sources”. Key outputs to reach the objectives are:

- Developing grid management capacity for the integration of decentralised solar power systems, including increasing digitalisation.
- Developing innovative instruments, processes or technologies to increase the share of decentralised solar power systems which will be systematically evaluated by energy utilities.
- Supporting the transmission grid operators to reach a position to improve the stability of the transmission grid, as a prerequisite for further expansion of grid-connected decentralised solar power plants.



Left: EEGIRE II aims to enhance the grid to accommodate more renewable energy sources

Right: Grid Studies and Innovation Facility (GSIF), has been established within the Power Grid Company of Bangladesh (PGCB)

Approach

After finalising the first phase of the Energy Efficiency and Grid Integration of Renewable Energy (EEGIRE I) project (06.2018 – 05.2021; EUR 3.0 m grant) with the objective “Decision-makers in the energy sector of Bangladesh have successfully enabled the integration of solar power into the electrical grid and improved energy efficiency in the electrical grid”, the second phase focuses primarily on the improvement of technical preconditions for further

expansion of grid-connected decentralised solar power plants. The project aims to improve the conditions under which stakeholders can integrate renewable energy, especially from decentralised solar power plants, into the electrical grid and improve its efficiency. To achieve the objective with its implementing partners, led by the Power Division of Bangladesh’s Ministry of Power, Energy and Mineral Resources (MPEMR), the project is pursuing a multi-stakeholder approach at several levels. It is structured in three components that reflect three levels of intervention:

COMPONENT 1	COMPONENT 2	COMPONENT 3
Aims to enable selected distribution companies to operate their electricity grid more reliably with an increasing share of decentralised solar power plants, and more efficiently through increasing digitalisation. The distribution companies will compile the knowledge gained on grid analysis, grid management and the digitalisation of the distribution business and integrate it into their operating routines.	Targets the systematic evaluation of innovative instruments, processes or technologies designed to increase the share of decentralised solar power systems by energy utility companies. Based on detailed evaluations and feasibility studies, utility companies are able to assess the potential benefits of investing in identified technologies for further increase of grid-connected solar power systems.	Enables the transmission grid operator in Bangladesh (Power Grid Company of Bangladesh) to improve the stability of the transmission grid as a prerequisite for expansion of grid-connected decentralised solar power plants.

Achievements



Grid Studies and Innovation Facility (GSIF) has been established to enable PGCB to conduct power system studies and develop approaches to support grid integration of renewable energy resources



More than 100 technical employees from different distribution utilities have been trained on distribution grid management for integration of renewable energy resources.



Preliminary feasibility analyses on five potential innovative instruments, namely smart charging of EVs, demand forecasting, demand side rooftop PV monitoring, battery energy storage, grid operation and optimisation tool have been conducted for the distribution utilities.

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