Report on

"Procurement Challenges and Opportunities in Scaling Up Renewable Energy in Bangladesh"

Submitted By

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A report submitted to the BIGD in partial fulfillment of the requirements for the degree of
Masters in Procurement and Supply Management (MPSM)

BRAC Institute of Governance & Development (BIGD)
BRAC University
October, 2025

Declaration

This is declared by Abdullah-Al-Mohit as follows:

1. I am submitting this internship report as my original work while completing my degree at BRAC University.
2. The report does not include material published or written by someone else, except where I have properly cited it with full and accurate references.
3. The report does not contain material that has been accepted or submitted for any other degree or diploma at a university or any other institution.
4. I have acknowledged my main sources of help.

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Letter of Transmittal

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Subject: Submission of Report on PSM-665: "Procurement Challenges and Opportunities in Scaling Up Renewable Energy in Bangladesh"

Dear Sir,

I am pleased to submit my report for the PSM-665: Supply Chain Management in Practice - Report/Practicum course on "Procurement Challenges and Opportunities in Scaling Up Renewable Energy in Bangladesh." The key procurement challenges in renewable energy expansion, examines current policies and identifies potential opportunities for sustainable energy growth in Bangladesh are focused in the report. The report includes the insights from government policies and power sectoral practices which aiming to provide a comprehensive understanding of procurement practices in the country renewable energy sector. I have made every effort to ensure the report meets the course objectives and provides valuable insights into the subject matter.

I have attempted my best to finish the report with the essential data and recommended proposition in a significant, compact and comprehensive manner as possible.

I trust and hold it in my chest that the report will meet the desire outcomes of the purpose.

Yours sincerely

_____
Abdullah-Al-Mohit
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October 21, 2025

Non-Disclosure Agreement

This agreement has been established and entered into by Power Cell, Power Division, Ministry of Power, Energy and Mineral Resources herein called the First Party and the undersigned student at the BRAC Institute of Governance and Development (BIGD), BRAC University, the Second Party. The Master's in Procurement and Supply Management requirements include a report on "Procurement Challenges and Opportunities in Scaling Up Renewable Energy in Bangladesh" which the First Party has given the Second Party permission to create on this. The Second Party will have the chance to interact closely with the representatives of the organization specially Mr. S. M. Masuduzzaman, Deputy Director (MIS) and give access to official information and statistics.

The Second Party will create a report based on their professional experience, statistics and information they have gathered. The second party may use any data and material for academic reasons while safeguarding the interests of the First Party by not making it public and will preserve the interests of the First Party.

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S. M. Masuduzzaman
Deputy Director (MIS)
Power Cell

Acknowledgment

All praise is due to Allah, the most merciful, who gave me the opportunity to complete this course in good health. My mother's blessings and the support of my spouse and kids have served as my biggest source of inspiration and motivation at this stage of pursuing my Master of Procurement and Supply Management (MPSM) degree. My respected supervisor, Mohammed Shoheler Rahman Chowdhury CP3P MCIPS, Faculty Member and Senior Trainer, BIGD, BRAC University has given me the best support and guidance and provided clear instructions for each step of preparing this report. In particular, I would like to express my sincere gratitude to my workplace supervisor Mr. S. M. Masuduzzaman, Deputy Director (MIS), Power Cell for providing the opportunity to complete this report with valuable suggestions. His guidance makes my work succession. Power sectoral data and information about renewable energy from his professionalism field impressed me greatly. The significant learning opportunities by the MPSM program offered by BIGD, BRAC University makes me gratefulness. To my MPSM colleagues, I express my gratitude for their unwavering support, tolerance and inspiration. Finally, I express my thanks to my family members and professionals who support me to prepare this report successfully.

Executive Summary

This report on "Procurement Challenges and Opportunities in Scaling Up Renewable Energy in Bangladesh" explores the country's renewable energy landscape with a focus on procurement practices in the RE projects. Bangladesh has set ambitious renewable energy goals through the Renewable Energy Policy 2025 and the Integrated Energy and Power Master Plan (IEPMP 2023). The nation aims to generate about 20% (around 6,145 MW) of its electricity from renewable sources by 2030 and 30% (around 17,470 MW) by 2041. These objectives are closely tied to Vision 2041 and the commitments made under the Paris Agreement. Strengthening procurement systems is therefore crucial to ensure energy security, promote sustainability and support the country's transition to a low-carbon future.

As of September 2025, the country's installed RE capacity is 1,632.29 MW which is about 5.3-5.6% of total installed capacity. The most from solar resource as of 1,338 MW including 377 MW off-grid and 961 MW on-grid (of which 2459 rooftop net-metered systems contribute 111 MWp). The other RE resources such as wind 62.9 MW, hydro 230 MW, biomass and biogas less than 1.5 MW by the SREDA, 2025 RE data source. To compare with the country's total installed power generation capacity of about 30,787 MW, more than 90 percent is still derived from fossil fuels, mostly gas. This conventional energy sources-based power generation underscores the pressing need to accelerate renewable energy expansion through more effective procurement strategies.

The following key areas are identified to mitigate procurement challenges that hinder the scaling up of renewable energy (RE) in Bangladesh:

- 12-18 months lengthy approval procedures for tender clearance.
- Import of major items of RE project such as solar panels and inverters and wind turbines highly dependable from abroad sourced.
- Scarcity of land for solar project development typically 3-4 acres per megawatt is required.
- RE infrastructure development financing gaps, estimated at USD 35-42 billion between 2025 and 2040 required.
- RE integration to the national grid network is constraints particularly variable solar and wind energy.
- More than 30 RE projects in recent years due to procurement complexities and delays in Power Purchase Agreement (PPA) finalization.

The following emerging opportunities are focused for the above constraints:

- Utility-scale solar parks expansion and piloting offshore wind projects such as the 500 MW Matarbari initiative supported by JICA.
- Implementation of 3,000 MW rooftop solar mandate by 2025 through net metering and fiscal incentives.
- Supportive fiscal policies including VAT exemptions and ten-year tax holidays.

- Introducing the public-private partnerships (PPPs) in large-scale solar and wind.
- Green financing initiatives for RE project development driven by institutions such as the World Bank ADB and IFC.
- Enhancement of the manufacturing the solar panels & inverter assembling factories.

In the report the global learning such as the India's solar auctions that achieved cost reductions of 20-30% and Vietnam's success with offshore wind PPPs are recommended for strategic procurement reforms in Bangladesh. The following are recommended in the report based on the above factors:

1. To expedite tender approval processes and minimize the duration of tending, a single-window clearance or approval mechanism processes.
2. To secure at least 750 MW of capacity per year, annually RE auctions competitive ways.
3. To bridge existing funding gaps, mobilizing green bonds and concessional finance.
4. Promotion of local manufacturing and supply chain resilience for RE technologies.
5. Smart grid network compliance for enhancing grid integration capacity through procurement of energy storage and digital management solutions.

The analysis includes in the report emphasizes that Bangladesh's transition to a sustainable energy future depends not only on access to technology but also on the strength of its procurement and supply chain systems. From the academic learning from the MPSM program and its principles such as transparency, ethical sourcing and stakeholder collaboration which will be vital for meeting renewable energy targets, reducing fossil fuel dependency and ensuring long-term energy resilience to get the sustainable contribution by the RE projects.

Keywords: Renewable Energy; Procurement; Public-Private Partnerships; Power Purchase Agreements; Financing, Energy Transition;

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List of Acronyms

ADB	:	Asian Development Bank
APSCL	:	Ashuganj Power Station Company Limited
BERC	:	Bangladesh Energy Regulatory Commission
BESS	:	Battery Energy Storage System
BIGD	:	BRAC Institute of Governance and Development
BPDB	:	Bangladesh Power Development Board
BPPA	:	Bangladesh Public Procurement Authority
BREB	:	Bangladesh Rural Electrification Board
BRPL	:	BR Powergen Limited
BPMI	:	Bangladesh Power Management Institute
BIFPCL	:	Bangladesh-India Friendship Power Company Limited
CPGCBL	:	Coal Power Generation Company Bangladesh Limited
DESCO	:	Dhaka Electric Supply Company Limited
DPDC	:	Dhaka Power Distribution Company Limited
EGCB	:	Electricity Generation Company of Bangladesh Limited
EPC	:	Engineering, Procurement and Construction
GoB	:	Government of Bangladesh
IEPMP	:	Integrated Energy and Power Master Plan (2023)
IFC	:	International Finance Corporation
IPP	:	Independent Power Producer
IRENA	:	International Renewable Energy Agency
JICA	:	Japan International Cooperation Agency
kWh	:	Kilowatt-hour
LNG	:	Liquefied Natural Gas
MoPEMR	:	Ministry of Power, Energy and Mineral Resources
MW	:	Megawatt
NLDC	:	National Load Dispatch Center
NESCO	:	Northern Electricity Supply Company
NWPGCL	:	North-West Power Generation Company Limited
PPA	:	Power Purchase Agreement
PGCB	:	Power Grid Company of Bangladesh PLC
PPP	:	Public-Private Partnership
PSM	:	Procurement and Supply Management
QCBS	:	Quality and Cost Based Selction
RE	:	Renewable Energy
SCADA	:	Supervisory Control and Data Acquisition
SPP		Sustainable Public Procurement
SREDA		Sustainable and Renewable Energy Development Authority
ToR	:	Terms of Reference
WtE	:	Waste-to-Energy
WZPDCO	:	West Zone Power Distribution Company Limited

Glossary

Auction	:	A competitive procurement process where bidders compete to offer the lowest tariff for supplying electricity.
Battery Energy Storage System (BESS)	:	Technology that stores energy from renewable sources like solar or wind for later use, improving grid stability.
EPC Contractor		Contractor manages the design, procurement, installation and commissioning of a project on a turnkey basis. The contractor delivers a fully operational facility to the client, ensuring efficiency, cost control and timely completion, making the EPC model common in large-scale and renewable energy projects.
Feed-in Tariffs (FiTs	:	A contractual arrangement in which the government or utility pays renewable energy generators a predetermined rate for the electricity they feed into the national grid, supporting long-term renewable energy development.
Floating Solar	:	Solar PV systems installed on water bodies, reducing land use conflicts and increasing generation potential.
Green Bonds	:	It is debt instruments issued to generate capital for financing renewable energy and other environmentally sustainable projects.
Independent Power Producer (IPP)	:	A private entity that generates electricity for sale to the national grid or consumers under contractual agreements.
Power Purchase Agreement (PPA)	:	A contract between the power producer and the buyer (such as BPDB) to supply electricity at an agreed tariff over a specified period.
Public-Private Partnership (PPP)	:	A procurement and investment model where both government and private sector share risks, costs and benefits of projects.
Net Metering	:	A policy for rooftop solar owners to sell excess electricity to the grid and offset their consumption.
Smart Grid	:	An electricity network that uses digital technology to monitor, manage and optimize electricity flows efficiently.
SCADA		An integrated hardware and software system that enables real-time monitoring, control and automation of power networks from a central control room. Also, remotely manage electrical equipment, collect sensor data, detect system faults and enhance grid reliability, safety and operational efficiency.
Waste-to-Energy (WtE)	:	Technology that converts municipal solid waste into usable electricity or heat.

Chapter 1: Overview and Analytical Framework

1.0 Introduction

Bangladesh is experiencing a crucial revolution in the energy sector which is fueled by the high economic growth rate, increased urbanization and standard of living. These movements exert pressure on the national power grid. Having more than 170 million population and a steady GDP growth of 6-7 every year adding the electricity demand that increases about 7-10 every year. To achieve this increased demand and meet the requirements of the country as outlined in the Paris Agreement and achieve the long-term vision as set forth in Vision 2041, there is a strong need to transition decisively towards renewable energy. The current energy mix is still based on the fossil fuels with more than 90 percent contribution against the renewable energy of only 1,632 MW (5.3-5.6) of installed capacities most of which is produced by solar energy (1,338 MW). The scale-up of renewable energy necessitates the implementation of technology, as well as the existence of strong procurement and supply chain management. The procurement is essential in ensuring that the solar modules, wind turbines, biomass systems, hydropower equipment and energy storage facilities are secured at minimum costs and delays are minimized, and the methodology is sustainable. The implementation of supply chain practices then is necessary to meet the objectives of the Renewable Energy Policy 2025 of 20% renewables (6,145 MW) by 2030 and 30% (17,470 MW) by 2041.

1.1 Background and Context

Bangladesh has a wide range of renewable energy, which forms a good background in clean energy development. The potential of solar energy is enormous, and the radiation is 4 to 6.5 kWh/m 2/day, which can be used in utility-scale, rooftop and floating solar systems. The coastline extends along a distance of 710km and the surrounding areas in the Bay of Bengal have a potential of about 10 GW of wind. Small hydropower adds about 230 MW but this can only be developed to a little more. Moreover, the biomass and biogas resources can be used in the agricultural areas using crop residues and organic wastes. Other emerging technologies such as tidal power, the use of river currents to generate hydropower and green hydrogen are also being explored. Regardless of these opportunities, there are still serious obstacles on the way of the project implementation in the power sector and the processes of the approval of the competitive bidding are often 12-18 months (or even longer). Moreover, 90-95 percent of the solar and wind components are imported, which strengthens the reliance on the global chain of supply. The issue of land acquisition is acute since solar power would take 3-4 acres per MW, which can compete with agricultural use. The domestic financing costs of 15-20 percent of the total project costs and the BPDB single-buyer model have been linked with the average payment delays of 90 days. The challenge of these procurement, financing and supply chain barriers is vital to making the renewable energy potential of Bangladesh turn into reality and become congruent with national development and climate targets.

1.2 Objectives of the Study

The main aim of the project is to investigate the procurement issues and opportunities in the process of scaling up the implementation of renewable energy (RE) in Bangladesh, as well as to prescribe the action plan in accordance with the academic and professional principles of the

Master of Procurement and Supply Management (MPSM) program. The targeted goals are the following:

- To evaluate the current procurement procedures implemented in the renewable energy projects, such as bidding, contracting and supply chain management.
- To determine significant procurement issues like land acquisition complications, funding and reliance on foreign technologies.
- To investigate the new opportunities within the framework of the Renewable Energy Policy 2025 such as rooftop solar growth, fiscal policies and policy-based procurement programs.
- To determine the efficiency of the existing policy and regulatory frameworks especially the Public Procurement Act (PPA) 2006 and Public Procurement Rules (PPR) 2008 and their relevance to procurement of renewable energy.
- To fill any financing gaps within the renewable energy projects and suggest appropriate green finance models including bonds, concessional loans and blended finance.
- To recommend reforms to promote transparency, efficiency, and the involvement of the private sector in the procurement of renewable energy and the implementation of the project.

1.3 Scope and Coverage

This study will be focused to the procurement and supply chain aspects of renewable energy development in Bangladesh. Its scope and coverage are determined in the following way:

Technological Scope: Solar (utility-scale, rooftop and floating), wind (onshore and offshore), small hydropower, biomass and biogas, waste-to-energy, battery energy storage systems (BESS) and technology emerging: green hydrogen.

Thematic Scope: The procurement models, the financing models, the technological dependency, the institutional governance and the public-private partnership (PPP) models concerning the renewable energy sector.

Geographical Areas: A national context outlook with a particular case example of a solar Engineering, Procurement, and Construction (EPC) project.

Temporal Scope: Review of the development between 2010 and 2023, analyse of the dynamics between 2024 and 2025 and projections till 2041 based on the vision 2041, the Integrated Energy and Power Master Plan (IEPMP) 2023 and the Renewable Energy Policy 2025.

1.4 Methodology

This study uses a secondary data methodology, which is a desk review, which is in line with the practicum requirement of the MPSM program. The important sources of data and information were identified in major sources of power in the country such as the Power Division, Sustainable and Renewable Energy Development Authority (SREDA), Bangladesh Power Development Board (BPDB), and the Ministry of Power, Energy and Mineral Resources (MoPEMR). Additional inputs were received through the international development partners including IRENA, ADB, World Bank, IFC and JICA. The legal and procedural context was

determined by reviewing policy and regulatory documents such as the Renewable Energy Policy 2025, Public Procurement Act 2006, Public Procurement Rules 2008 and the Net Metering Guidelines 2018. Moreover, the analysis of the relevant academic publications, the sectoral reports and industry journals (e.g., Energy and Power Magazine and publications of the Bangladesh Solar and Renewable Energy Association (BSREA)) were examined to guarantee having a full picture regarding the sectoral practices. Thematic analytical method was used to discuss procurement, financing and technological issues. The internal weaknesses and strengths as well as external threats and opportunities were assessed by using a SWOT analysis framework. Comparative analysis against international best practices including solar auction systems in India and wind energy alliances in Vietnam were done to put the performance of Bangladesh into perspective. Moreover, a gap analysis was conducted to determine the disparities between the policy goals and the actual results. Lastly, scenario planning was used to evaluate the possibility of meeting the national goal of producing an average of 750 MW of renewable energy capacity each year by the year 2041.

1.5 Review of Literature and Documents

Literature on renewable energy (RE) in Bangladesh has been increasing in the recent past though it has been fragmented and unevenly developed. The majority of researches are concerned with policy guidelines, resource evaluation, and financial systems and do not pay much attention to the efficiency of the procurement procedures and supply chain management in the renewable energy industry. Key regulatory instruments, including the Renewable Energy Policy 2008 (revised 2025), the Integrated Energy and Power Master Plan (IEPMP) 2023, Public Procurement Act 2006 and the Net Metering Guidelines 2018, recognize the role of procurement, but they do not give much practical advice on how procurement should be applied in renewable energy projects. According to the development partners such as Asian Development Bank (ADB), World Bank, International Finance Corporation (IFC), Japan International Cooperation Agency (JICA), and International Renewable Energy Agency (IRENA), vital insights have been shared; they primarily revolve around investment frameworks, financing techniques and risk-sharing approaches. Nevertheless, in their analyses they tend to ignore the particular procurement problems in Bangladesh including bureaucratic delays, land acquisition problems and overdependence on imported technology. The literature available in academia and the sector identifies these barriers but does not give detailed process based views of how procurement and supply chain practices influence the delivery of renewable energy projects. The report has distinguished itself by looking at the reality of procurement and supply chain gaps using the case of A Solar Power Plant to provide insight on how these issues manifest themselves in reality. This report is problem-oriented, unlike the past research which primarily reiterates policy objectives or performs an extensive map of the resources available, which relies on desk research and analysis of documents. It puts the sustainable energy development of Bangladesh in a context of streamlined procurement strategies and streamlined supply chain models. As a result, this paper presents a new dimension of research as it explores the aspect of procurement efficiency that has not been widely studied in the renewable energy projects in Bangladesh, and this fills a notable gap in the existing literature.

1.6 Assumptions and Limitations

There are a number of assumptions that have been made in this study. It presupposes that the current policy tools like the Renewable Energy Policy 2025 and the Net Metering Guidelines 2018 will remain valid and relevant during the period of the research. Government publications and reports by development partners are deemed to be credible sources of secondary data. It also presupposes that the international best practices, particularly the Indian and Vietnamese ones, can be applied to the situation with renewable energy in Bangladesh. Nevertheless, there are certain limitations that are accepted. Being a desk-based research, it does not involve field surveys or interviews with the stakeholders as secondary data is solely used. Information loopholes still exist in such aspects like in the private-sector Power Purchase Agreements (PPAs), feedstock supply chains that are not always publicized. In addition, since the renewable energy policies in Bangladesh undergo continuous transformation, the relevance of the findings to the current research in future might be affected by changes in the policies or the institutional structures.

Chapter 2: Bangladesh Power Sector

In recent years, Bangladesh has demonstrated remarkable economic resilience, sustaining an average GDP growth rate of over 7 percent. Also, Bangladesh has registered impressive growth in GDP over the last few years and on average, the country has recorded more than 7 percent growth per annum. The economy continued to record more than 6 percent growth even in a time when the rest of the world was experiencing a financial crisis due to high domestic consumption, increased demand in exports and stable remittances inflow of foreign workers. The country occupies significant places in the world production- it ranks second in garment exports, seventh in fish production, fourth in rice production, third in vegetable production and 37 th among the largest economies in the world. Having a stable macroeconomic base, its credit ratings are stable. Bangladesh has an open and credible attitude towards foreign investment that has not expropriated any foreign-owned property or defaulted on payment agreements. Incentive packages given to foreign investors are regarded as one of the best in the power sector, especially.

Electricity is an essential facilitator of the contemporary lifestyle, as it affects all areas of the development of a country. It forms the basis of economic growth, social improvement, improvement of healthcare and education systems, and the quality of life in general. Affordable and reliable energy must be available to everyone in a sustainable development. In this regard, Bangladesh has adopted specific plans in enhancing generation, transmission and distribution capacity. Some of the sector successes are as follows:

Particulars (units)	**Achievement** ***(September 2025)***
Power Plants (nos)	134
Installed Capacity (MW) including Renewable Energy and Captive Power Generation	31,610
Highest Generation (MW)	16,794 (23 July 2025)
Power Import (MW)	2,656
Consumers (Million)	48.88 (August 2025)
Transmission Line (Circuit kilo-meter)	17,559
Distribution Line (Kilo-meter)	6,49,000
Grid sub-station capacity (MVA)	78,896
Per Capita Generation (KWh)	661 (FY 2024-25)
Irrigation Connection (nos)	4,98,000
ADP Allocation (In Core)	23,700.67 (FY 2025-26)
Distribution System Loss (%)	7.38% (June'25)

Table-1: Scenario of Bangladesh Power Sector

2.1 Power Division

The Power Division was established on March 25, 1998, under the Ministry of Power, Energy and Mineral Resources with the mandate of formulating policies and management of programs pertaining power production, transmission and distribution.

Vision: Universal access to quality electricity in a cost-effective and affordable manner. **Mission Statement:** Ensuring quality and Uninterruptable electricity for all by 2030 through integrated development of power generation, transmission and distribution system.

2.2 Key Specialized Agencies under Power Division

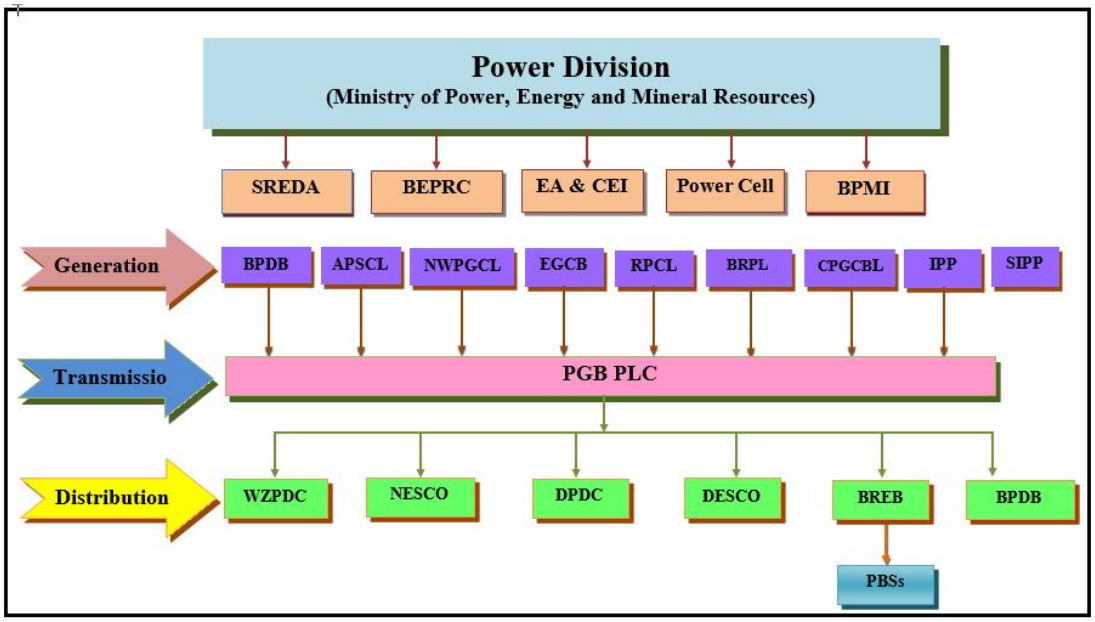


Figure-1: Power Sector Utilities

2.2.1 Bangladesh Energy and Power Research Council (BEPRC):

This is a policy-making institution, which is critical in energy policy formulation. This council was founded on October 26, 2015, to work out long-term energy sector strategies, foster research and innovations, and collaborate with local and foreign professionals to develop energy technologies.

2.2.2 Sustainable and Renewable Energy Development Authority (SREDA):

Established in accordance with the SREDA Act of 2012, the authority aims to decrease fossil fuel-based energy, decrease the environmental risks, and increase the energy efficiency. It commenced its operations on May 22, 2014, and has five wings, including Administration, Renewable Energy, Energy Efficiency and Conservation, Finance, and Policy and Research.

2.2.3 Office of the Chief Electric Inspector:

This office has been in operation since 1947 (in Chittagong) and is charged with the responsibility of inspecting new high voltage and medium voltage installations including substations and industrial facilities and giving them the go-ahead to be connected to the grid.

2.2.4 Power Cell:

Established in 1996 to assist in the policy reforms, new regulations, and revision of sector guidelines to the increasing electricity demand.

2.2.5 Bangladesh Power Management Institute (BPMI):

Founded in 2017, BPMI is the primary professional training and education hub among the personnel of the power industry in the country.

2.2.6 Bangladesh Power Development Board (BPDB):

The power development board is the name of the state-run power company in Bangladesh. BPDB is historically the leader in the field of generation, transmission, and distribution and remains the sole electricity buyer.

2.3 Power Generation Entities

The power generation in Bangladesh is operated by eight organizations:

Sl No.	Name of the Organization
1.	Bangladesh Power Development Board (BPDB)
2.	Electricity Generation Company of Bangladesh Ltd. (EGCB)
3.	Ashuganj Power Station Company Ltd. (APSCL)
4.	North West Power Generation Company Ltd. (NWPGCL)
5.	Coal Power Generation Company Bangladesh Ltd. (CPGCBL)
6.	Rural Power Company Ltd. (RPCL)
7.	BR Powergen Company Ltd. (BRPL)
8.	Bangladesh-India Friendship Power Company Ltd. (BIFPCL

Table-2: Power Generation Entities

2.4 Power Transmission

The Power grid company of Bangladesh PLC (PGB PLC) is the only transmission company in Bangladesh founded in November 1996 as part of the power sector reorganization program by the government and it is in charge of the national grid with 17255 circuit kilometers of transmission lines to ensure smooth flow of electricity between the sources of power and the distribution utilities. The National Load Dispatch Center (NLDC) under PGB PLC undertakes the daily forecasting of power loads and real-time balancing to address the electricity demands of the distribution utilities nationwide to make it a core pillar in maintaining the balance between generation and consumption, and thus ensure uninterrupted power supply to consumers in the country and further accommodate RE integration with more upgraded infrastructure procurements of solar and wind evacuation including SCADA and smart grid technologies to manage the variation in outputs and losses to a minimal of less than 8 percent by 2030.

2.5 Power Distribution Companies

The distribution of electricity in Bangladesh is dealt with by six large organizations, and each organization is in charge of providing power in the geographical areas assigned to them:

Sl No.	Name of the Organization
1.	Bangladesh Power Development Board (BPDB)
2.	Bangladesh Rural Electrification Board (BREB)
3.	Dhaka Power Distribution Company Ltd. (DPDC)
4.	Dhaka Electric Supply Company Ltd. (DESCO)
5.	West Zone Power Distribution Company Ltd. (WZPDCO)
6.	Northern Electric Supply Company Ltd. (NESCO)

Table-3: Power Distribution Entities

2.6 Independent Power Producers (IPPs)

The involvement of the power sector in Bangladesh by the private sector has increased significantly in the form of independent power producers (IPPs). The country is currently operating over 100 IPPs that provide some 50 percent of the total power generation capacity. This is a demonstration of the policy of the government to focus on the involvement of the private sector to satisfy the ever-increasing electricity needs. There are several distinct categories of IPPs, namely:

- Large Thermal Power Stations (>100 MW): Power plants which are gas-powered, coal-powered, or liquid-fuel-powered and provide bulk electricity to the national grid.
- Medium-scale Quick Rental and Small IPPs (1 -100 MW): Smaller plants that are intended to add generation capacity rapidly, usually powered by liquid fuel and gas engines.
- Renewable energy IPPs, such as solar parks, wind farms, and biomass/biogas facilities, which can help the transition to a cleaner energy mix by utilizing incentives under the RE Policy 2025 of local sourcing of panels and digesters, although they face procurement challenges like risk perceptions in volatile supply chains of hydro turbines and biogas components, requiring further development of PPP frameworks to overcome these challenges and achieve a 20 per cent contribution to the energy mix by 2030.

The importance of IPPs is their contribution to the diversification of the sources of investments, minimizing the burden on the governmental funding and guaranteeing the constant availability of electricity to support economic growth.

2.7 Power Generation Scenario

By September 2025 the Bangladesh Power Development Board (BPDB) records an overall installed generation capacity of 28,132 MW. The energy mix is still dominated by natural gas and coal although renewable sources of energy (solar, hydro and wind) are slowly taking over the grid. The following bar chart explains the detail generation in Bangladesh according to fuel that takes into consideration none part (captive, off-grid renewables and under maintenance units of power plants):

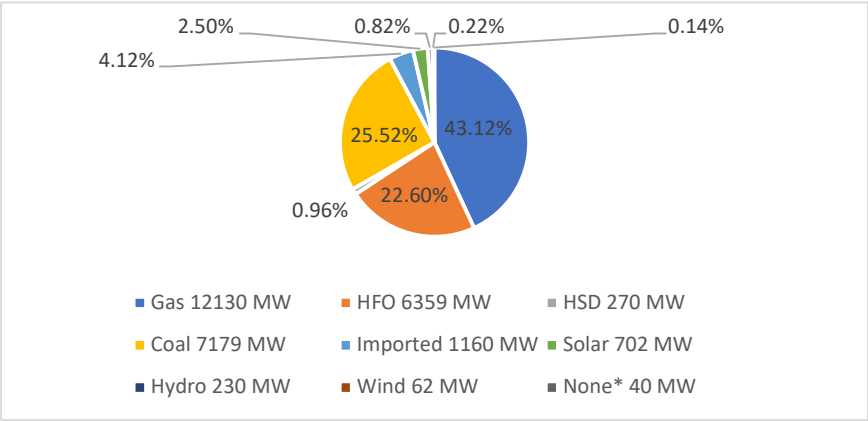


Figure-2: Fuel based installed Capacity in MW

2.8 Power Sector Roadmap

The government has outlined ambitious targets to generate 35,400 MW by 2030, 63,100 MW by 2041 and 84,900 MW by 2050, necessitating the development of large-scale power plants to accommodate increasing electricity demands and in alignment with this vision, the expansion of transmission infrastructure has been prioritized, evolving from initial lengths of 838 circuit km for 230 kV lines and 4,755 circuit km for 132 kV lines to the construction of 2,497 circuit km of 400 kV lines, 4,263 circuit km of 230 kV lines and 8,864 circuit km of 132 kV lines which collectively enhance regional demand distribution and system reliability by incorporating measures to sustain operations during single power source outages, as detailed in the future power sector development plan up to 2050.

Description	Year 2025	Year 2030	Year 2041	Year 2050
Power installed capacity (MW)	31,610*	35,400	63,100	84,900
Electricity Demand (MW)	17,000	27,100	50,400	70,500
Transmission line (Ckt. KM)	17,559	24,000	36,900	40,500

*Including captive and renewables

Table-4: Power Sector's present and future plan

2.9 Renewable Energy in Bangladesh

Government has taken step to promote renewable and clean energy alongside fossil fuel. Government has established Sustainable and Renewable Energy Development Authority under Sustainable and Renewable Energy Development Authority Act, to facilitate sustainable energy i.e. renewable energy as well as energy efficiency. To fulfill the government target of generating electricity from renewable energy sources, SREDA is ready to provide any sorts of assistance within its purview to implement renewable energy projects. At present, approximately 1632.29 MW renewable energy system has been installed [Data source: SREDA, National Database of Renewable Energy, dated 18/09/2025]

Technology	Off-grid (MW)	On-grid (MW)	Total (MW)
Solar	377.05	961.25	1338.3
Wind	2	60.9	62.9
Hydro	0	230	230
Biogas to Electricity	0.69	0	0.69
Biomass to Electricity	0.4	0	0.4
Total	380.14	1246.46	**1632.29**

Table-5: Total Generation from Renewable Sources

Bangladesh has formulated 'Net Metering Guideline' to promote rooftop solar system in the country. This guideline encourages consumer to become prosumer by the utilization of free space in their buildings for solar power generation. So far, 2459 systems have been installed under Net Metering Scheme with total capacity of 111.237 MWp. Moreover, 3403 solar irrigation system has been implemented, its total capacity is 57.609 MWp. At present 12 solar parks have been set up in the country, its total capacity is 537 MWp.

Bangladesh plans major growth in renewable energy as outlined in the Integrated Energy and Power Master Plan (IEPMP 2023) and the upcoming Renewable Energy Policy 2025. By 2030, the country aims for renewables to supply about 20% of total electricity generation, or roughly 6,145 MW. This target includes around 4,000 MW from solar power (mainly rooftop and utility-scale projects), 1,000 MW from offshore wind, 500 MW from hydropower modernization and another 500 MW from biomass and waste-based sources.

By 2041, Bangladesh expects renewable energy to reach about 30% of total capacity approximately 17,470 MW supported by steady yearly growth of around 750 MW. In the long term, the country plans to adopt emerging technologies such as floating solar, tidal and wave power, river current energy and green hydrogen. However, major improvements in procurement systems, contract management and the development of strong, localized supply chains will be the major filed area to reach the goals for sustainable power sector.

2.10 Policy and Legislative Framework in the Power Sector

Power sector is governed by a combination of Acts, policies and guidelines. Achieving the mission and vision of power sector to implementation of this legislation frameworks in the tendering of power projects and overall sectoral procurement activities.

Key Acts:

- Electricity Act 2018
- Bangladesh Energy Regulatory Commission Act 2003 (amended 2020)
- SREDA Act 2012
- Bangladesh Energy and Power Research Council Act 2015

Key Policies & Guidelines:

- Renewable Energy Policy 2008 (updated 2025)
- Net Metering Guidelines 2018
- RAPSS Guidelines 2007 (for off-grid RE)
- Power Pricing Framework 2004
- Private Sector Power Generation Policy 1996 (revised 2004)
- Policy Guidelines for Power Purchase from Captive Plants 2019
- Draft Policy for Enhancement of Private Participation 2025

2.11 Procurement Practices for Purchase of Power Plants

Power generation organizations within the Power Division, primarily, Power Development Board (BPDB) in Bangladesh are at the center of power plant procurement, including by Independent Power Producers (IPPs). These procurement operations are informed by Public Procurement Act (PPA) 2006, Public Procurement Rules (PPR) 2008 and the working guidelines of the Bangladesh Public Procurement Authority (BPPA). The overall goals of these tools are to enhance transparency, competitiveness and value for money (VfM) whereby the BPDB is the sole purchaser of electricity on long-term Power Purchase Agreements (PPAs).

In the past, procurement practices tended to leave the competition principles. In the Quick Enhancement of Electricity and Energy Supply (Special Provisions) Act, 2010, unsolicited proposals and direct negotiations were commonly used to award many IPPs. Although this framework increased the generation capacity in periods of acute shortages, it became a subject of criticism due to lack of transparency, vulnerability to favouritism and financial crippling of

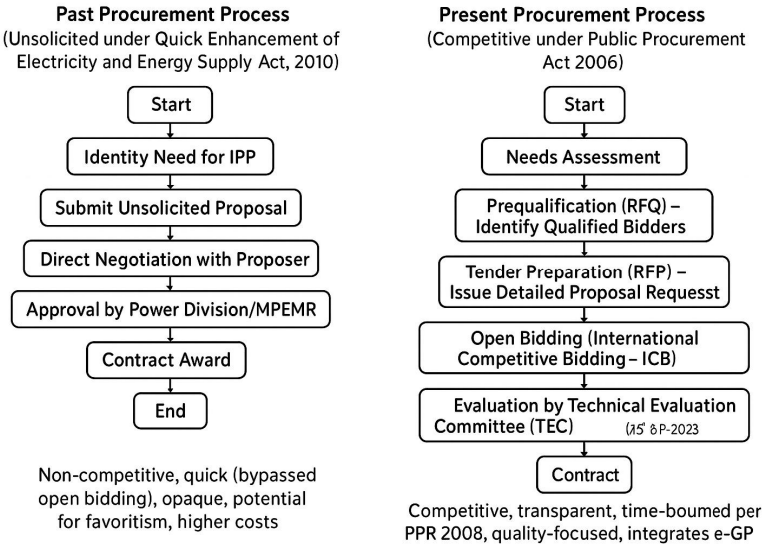
the high-capacity payments and subsidies. The IPPs under this regime that were procured on fossil fuel (gas, HSD, HFO) were later found to be renegotiable in the FY2025-26 budget.

To re-establish accountability and align with international standards, the 2010 Act was repealed in 2024 by the interim government and all contracts signed under it were placed under review. Since then, procurement of IPPs has largely reverted to International Competitive Bidding (ICB), based on a single-stage two-envelope system, which involves:

- Prequalification (RFQ): Screening firms on technical expertise and financial strength.
- Request for Proposals (RFP): Inviting prequalified bidders to submit technical and financial bids.
- Evaluation: A Technical Evaluation Committee (TEC) first reviews technical bids. Only technically qualified bidders proceed to financial evaluation.
- Approval: Final awards are endorsed by the Ministry of Power, Energy and Mineral Resources (MPEMR) and the Cabinet Committee on Government Purchase (CCGP).

For renewable IPPs particularly solar and wind procurement is increasingly conducted through open tendering under the Sustainable Public Procurement Policy 2023, which integrates environmental and sustainability considerations into bid evaluation. Although unsolicited proposals are still permissible under the Policy for Enhancement of Private Participation in the Power Sector, 2025, they must now be validated through competitive processes and encourage for the private investor. In parallel, government-to-government (G2G) procurements remain to emphasize the countries collaboration.

Projects funded by the public go through the Development Project Proforma/Proposal (DPP) process that consists of feasibility studies, inter-ministerial review and ultimate approval of the Planning Commission. Though the DPP approval could be 12-18 months, it provides stringent planning and institutional responsibility. Recently, the grid-tied solar tenders of BPDB in February 2025 were run using ICB following PPR with organized pre-bid meetings to elucidate technical requirements. Below is a comparative flow diagram of the procurement process comparing the historical unsolicited route that was used in the 2010 Act with the current competitive approach under PPA 2006/PPR 2008:



For more competitiveness of bidding process for purchase of the power projects especially Solar Power Plant, the repeal of the 2010 Act and the implementation of competitive procurement systems is a major governance change. These are likely to boost efficiency, cost-effectiveness, and transparency and establish a stronger and more responsible power sector in Bangladesh.

2.12 Sustainable Power Sector Mechanism

Government of Bangladesh has made efforts to modernize and empower the power sector, which is in line with Sustainable Public Procurement (SPP) Policy of Bangladesh Public Procurement Authority (BPPA). The efforts are part of the measures that will guarantee the availability of reliable, cost effective yet environmentally responsible supply of electricity.

Key initiatives include:

- Distribution Modernization: Automation of distribution networks, smart meter deployment and underground substations to improve efficiency and reduce losses.
- Digital Infrastructure: Application of the GIS mapping, SCADA/EMS, smart grids, and ICT-based monitoring to improve operational control.
- Plant Efficiency: Refurbishment and repowering of aging power plants along with demand-side management to improve performance and more energy efficient to reduce emissions.
- Base Load and Renewable Energy Balance: Development of cost-effective base load power plants and an incorporation of renewable energy as part of the Renewable Energy Policy 2025 as a means of diversification and sustainability in the long term.
- Fuel and Energy Diversification: Reduction of fossil fuel used and increasing the renewable sources based clean energy for electricity generation, such fuel diversification will help to ensure sustainability in power sector.
- Policy and Regulatory Reforms: Repeal of the 2010 Special Provisions Act and the forthcoming Policy for Enhancement of Private Participation 2025 to strengthen transparency, competitiveness and investor confidence.

Collectively, these initiatives incorporate sustainability, efficiency and accountability into the procurement and project implementation, which are the fundamental principles of the SPP of BPPA and that helps achieve the long-term objectives of the energy transition of Bangladesh.

Chapter 3: Procurement Challenges and Opportunities of RE

The process of procuring renewable energy (RE) projects in Bangladesh is a complicated environment which is marked by both considerable opportunities and huge challenges. Although the nation has registered significant progress in the overall power sector to ensure that an installed capacity of 31,610 MW is attained by September 2025, the renewable energy market encounters distinct procurement-based challenges that have limited its expansion and made it difficult to meet the national targets.

In this chapter, the author conducts an in-depth examination of these opportunities and challenges and specifically addresses the major technologies that have promoted the transition to renewable energy in Bangladesh. It emphasizes utility-scale parks and rooftop installations encompassing onshore wind pilot projects and emerging offshore wind with public-private ventures and battery energy storage systems (BESS) which are critical for maintaining grid stability. This chapter seeks to discover specific interventions that can be used to achieve the full potential of the renewable energy in Bangladesh by analyzing the procurement processes, regulatory frameworks and supply chain dynamics.

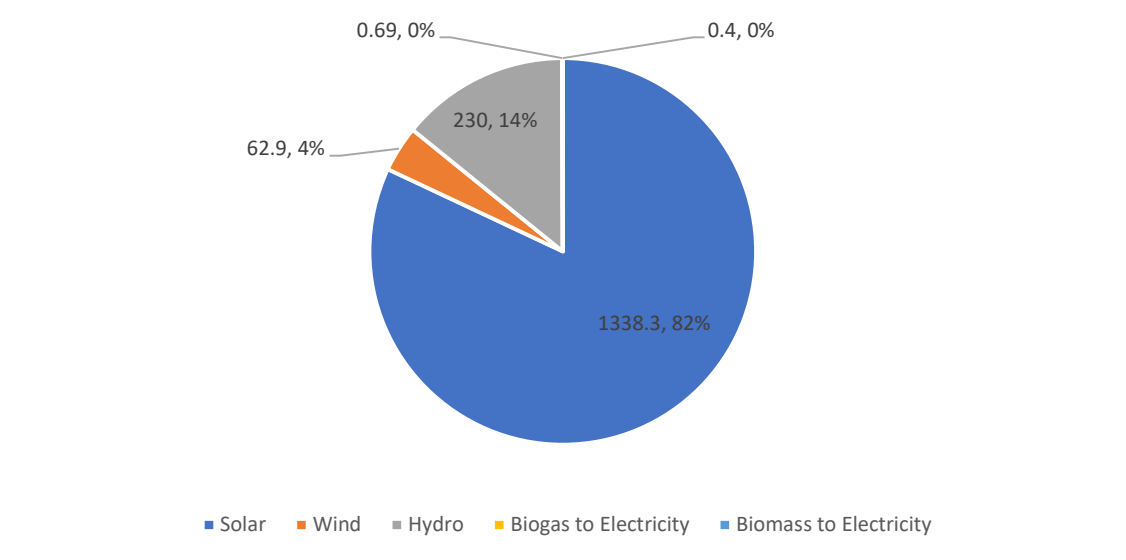


Figure-3: Renewable Energy Scenario in Bangladesh

The current renewable energy (RE) procurement system in Bangladesh is within a power sector framework that was initially made to support traditional thermal power projects. This organizational orientation generates a basic incompatibility between the institutional strengths, including the focus of the Bangladesh Power Development Board (BPDB) on large-scale Power Purchase Agreements (PPAs) and the specific demands of renewable energy that encompass variable output management as well as localized supply chains. These misalignments hence create bottlenecks in the project development, financing acquisition and implementation, which tend to cause delays and cost overruns. However, new policy and institutional efforts are providing new avenues of procurement of renewable energy in a more effective way. Renewable Energy Policy 2025 and its incentives to local manufacturing, combined with the technological innovations in the hybrid systems and an increase of the

international support of the development partners, including JICA and the World Bank, is facilitating more efficient tendering processes, risk sharing between the public and the private (PPP), and creation of resilient supply chains. These initiatives are essential in the attainment of the 750 MW of renewable capacity additions per annum that is to be met by 2030 as part of the 20 percent renewable energy target.

3.1 RE Types in Bangladesh

The Renewable Energy Policy 2025 establishes the intention of Bangladesh to diversify its power generation mix by the use of a large variety of renewable energy (RE) technologies. All resources have unique procurement and supply chain needs that are needed to generate less dependency on imported fossil fuels, enhance the energy security and mitigate climate risks.

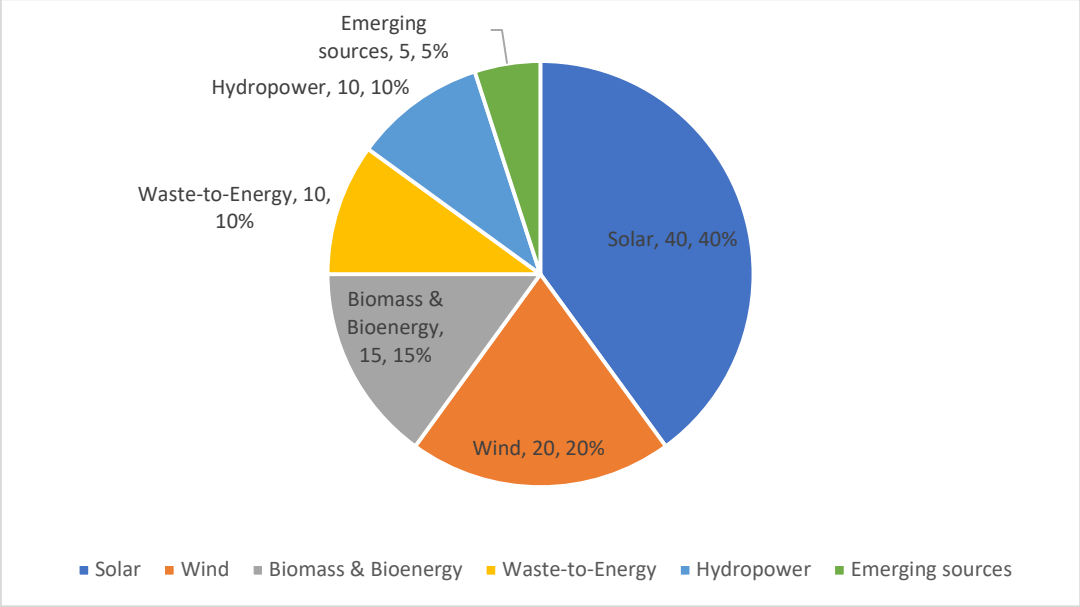


Figure-4: Indicative RE Portfolio Bangladesh as per RE Policy, 2025

Bangladesh is diversifying its renewable energy (RE) portfolio and exploring various technologies in order to diversify its power mix to make it sustainable. The solar is divided into large grid-based parks, which are built via auctions, rooftop solar via net-measurement plans and decentralized frameworks like mini-grids and irrigation motors on rural lands. Innovative and scalable solutions such as floating solar and solar-powered EV stations are presented.

Onshore and offshore projects in wind energy are the former being taken up via EPC contracts that are applicable to low wind speeds and the latter with robust marine infrastructure where the Bay of Bengal has an estimated capacity of 10 GW. The biomass and bioenergy projects are aimed at ensuring agricultural remnants and biogas feedstocks whereas waste-to-energy projects include municipal, medical and industrial wastes with the help of modern conversion and emission control technologies.

Hydropower projects are based on environmentally friendly designs by inviting bids internationally on turbines and control systems. New sources like geothermal, tidal, waves, river flow, green hydrogen and biofuels indicate the diversification priorities in future.

The general goal of the renewable energy strategy in Bangladesh is to establish a resilient and locally based supply chain, which is consistent with the national climate commitments (NDCs). The major challenge in the current energy transition is to ensure efficiency, sustainability and cost optimization is achieved through a well-managed procurement and supply.

3.2 Procurement Practices for RE Projects

The renewable energy industry in Bangladesh is growing in various sources that include solar, wind, hydro, biomass and energy storage with different procurement requirements and issues. The procurement of solar based power generation project is primarily based on competitive auctions and EPC contracts with Independent Power Producers (IPPs).

Although the country has vast rooftop solar potential (around 40,000 MW) growth is hindered by land constraints, heavy dependence on imported equipment and delays in power purchase agreements (PPAs). Power evacuation from large scale solar park and its integration to the national grid network also have huge challeges.

Wind energy projects include both onshore and offshore initiatives. Onshore systems face low wind speeds while offshore development holding an estimated 10 GW potential requires advanced marine logistics and specialized components. Key barriers are high investment costs, weak port capacity and lack of local turbine and other machinery manufacturing. Also no attractiveness in terms of financial and legal emphasis actions are present for the global investors for such wind (onshore/offshore) project to mitigation the risk.

Hydropower contributes about 230 MW through small-scale, run-of-river plants. Project delays often arise from lengthy environmental clearances and sedimentation risks though localized EPC contracts could accelerate small hydro expansion while limiting ecological impact.

Biomass, biogas and waste-to-energy (WtE) projects depend on agricultural residues and urban waste. Their success relies on stable feedstock supply chains and effective waste management. Challenges such as seasonal feedstock variation and poor waste segregation seen in Dhaka's pilot WtE plants raise operational costs and delay outcomes.

Intermittent solar and wind power cannot be integrated without Battery Energy Storage Systems (BESS). Although the initial costs are high and local experience is low, the international tenders and concessional financing can be used to implement the latest storage technologies and enhance the stability of the grid. On the whole, procurement, logistics and policy issues are essential to the successful and sustainable scaling of Bangladesh clean energy transition.

3.4 Key Procurement Challenges

The renewable energy (RE) development in Bangladesh is exposed to various procurement-based limitations that influence the project schedule, costs and project viability. These difficulties are based on regulatory, financial, logistical and institutional inefficiencies, which should be solved to meet the sustainable energy transition objectives.

- Regulatory and Institutional Delays: RE projects take time to process procurement because of the various approvals that are required; Power Division, SREDA, BPDB and the Ministry of Environment. The duplication of mandates and paper-based record

keeping also slows down implementation as over 30 projects have been suspended. These delays can be minimized by creating a single-window approval system that is centrally located to improve transparency.

- Major Reliance on imported Technologies: Over 90 percent of solar equipment and 95 percent of wind turbines is imported, so the projects are prone to foreign exchange risks, custom delays and international supply chain failures. Such reliance increases the cost of projects to a maximum of 20%. Also the local market for manufacturing the solar project equipment, it subsidies and technology transfer alliances might enhance cost-effectiveness and create local resilience.
- Funding limitations and Capital Intensive: The RE sector needs USD 35-42 billion of investment in the period of 2025-2040. Restricted access to cheap long-term funding, coupled with high domestic interest rates and the fear of the investor about the security of payment, limits funding to projects. Green bonds, concessional financing, and blended finance in the form of public-private partnerships (PPP) are some of the mechanisms that can be used to bridge these financial gaps.
- Limitations on the Acquisition of Land and Infrastructure: Solar projects demand 3-4 acres per MW that poses a competition to agriculture and urban development. Delays are compounded by land issues, and insufficient grid capacity in potential areas especially coastal areas. These barriers could be overcome by having a national land bank and focusing smart grid investments such as Battery Energy Storage Systems (BESS) and SCADA.
- Payment and Contractual Uncertainties: According to the single-buyer model of the BPDB, the approvals of Power Purchase Agreement (PPA) take more than 90 days, which poses a liquidity and currency risk to investors. This ambiguity will not help the private sector to invest in new RE projects. To establish investor confidence, there is a need to have standardized contracts, escrows and special purpose payment security funds.
- Technological and Human Capacity Gaps: Bangladesh does not have local facilities on advanced manufacturing of RE, testing and maintenance. Lack of qualified human resources especially in grid management and RE project planning also limits efficiency. These gaps have to be filled through capacity-building programs and collaboration with international institutions to enhance institutional preparedness.

3.5 Emerging Procurement Opportunities

Nevertheless, structural challenges do not rule out prospects of the RE sector in Bangladesh, which has prospects of policy innovation, localization of technology and sustainable financing. The exploitation of these opportunities can help the organization to grow its capacity much faster and bring procurement practices to the best international standards.

- Expanding of Utility-Scale Solar Parks: Government efforts to allocate public land for large solar installations such as the planned 500 MW Matarbari project are facilitating competitive EPC tenders and attracting foreign bidders. Hybrid systems with BESS and

solar can be used to make auctions transparent and decrease costs and improve grid stability.

- Rooftop Solar Incentives and its Mandates: The Net Metering Guidelines (2018) and the 3,000 MW rooftop target by 2025 promote decentralized procurement models to encouragement of the private sector. Streamlined tendering, tax holidays and VAT exemptions attract involvement of the private sector and industries, strengthening the utilization of digital e-GP and corporate PPAs.
- Offshore Wind Development: JICA and NREL have determined that the Bay of Bengal has 10 GW of offshore potential. Pilot projects may assume the PPP procurement models with the risk sharing and technology transfer clauses. One of the main ways of amplifying marine renewable investments will be through strengthening port and logistics infrastructure.
- Access to Green Financing Instruments: Partnerships with multilateral agencies such as the ADB, World Bank and IFC are enabling concessional lending, guarantees and blended finance solutions. The emission of sovereign green bonds and the creation of national green finance systems can decrease the cost of capital and make long-term projects sustainable.
- Public-Private Partnerships for Risk Mitigation: The Policy to promote the involvement of the private in the power sector 2025 promotes the idea of risk-sharing PPP in relation to solar, wind, and waste-to-energy projects. Unified contracts and incentives that depend on the performance can help in fast track the execution of the project and enhance transparency.
- Localization of Technology and Supply Chains: Domestic assembly of solar modules, inverters and battery system can be promoted by fiscal incentives, tax rebates and technology transfer programs. Floating solar and green hydrogen are new procurement niches that can be presented to tenders based on innovation and contribute to the development of self-reliance in the RE ecosystem.
- Digital and Transparent Procurement Tools: The extension of the national e-GP system to renewable tenders would increase efficiency, traceability and integrity. The inclusion of sustainability metrics in the evaluation of the bids would guarantee the ethical sourcing and lifecycle responsibility, as the procurement reforms are aligned with the Sustainable Public Procurement Policy 2023 and procurement values of transparency and value-effectiveness.

Chapter 4: Conclusion and Recommendations

The renewable energy development in Bangladesh is also experiencing significant procurement issues such as prolonged approval time, dependence on imports, funding shortfalls and institutional capacity. Reforms, to be made towards meeting its 2030 and 2041 RE targets, should focus on enhancing its procurement efficiency, transparency, and competitiveness. To enhance the input of RE to Bangladesh Power Sector the following areas have to be targeted:

4.1 Procurement Reforms

- Single-Window Clearance Mechanism: To fast track the implementation of renewable energy project, Bangladesh needs to develop a centralized digital system under SREDA or the Power Division to process all the procurement approvals, such as land acquisition, PPA finalization, tariff approvals and customs clearance. This unified system will cut the existing tender approval period of 12-18 months down to less than six months to reduce bureaucracy and enhance transparency and the speed with which renewable energy can be installed.
- Standardized Procurement Models: Bangladesh ought to come up with standardized Power Purchase Agreement (PPA) templates to improve security of payment and offer investors predictable contractual frameworks. Also, the establishment of standardized EPC and O&M contracts of solar, wind and biomass projects will simplify the process of procurement, minimize legal and administrative risks and uncertainty and expedite project implementation without compromising on the quality and adhering to the regulatory requirements.
- Competitive Renewable Energy (RE) Auctions: Bangladesh is to initiate yearly reverse auctions in order to bring at least 750 MW of renewable energy capacity annually. An approach like the competitive solar bidding that India has adopted that resulted in a tariff that had been cut by 20-30% would make the price more competitive, encourage investor interest and guarantee transparency in procurement. This would also hasten the implementation of renewable projects and provide better value to money by means of fair and market-based pricing.
- Digital Procurement Expansion (e-GP): Renewable energy-based tenders to be made under the national electronic Government Procurement (e-GP) system to increase transparency and efficiency in procurement of Bangladesh. The strategy will simplify the bidding procedures, shorten administrative delays, decrease conflicts and offer a clear to follow auditable trail to all the stakeholders and ultimately enhance quicker and more responsible project implementation.

4.2 Financing Mechanisms

- Green Bonds & Sovereign Guarantees: Bangladesh can consider issuing Green Energy Bonds to lure institutional investors and amass capital on the long-term basis to finance renewable energy projects. Simultaneously, by offering partial risk insurance to foreign investors, it is possible to reduce financial risks, increase the bankability of the project, and promote international investors to take part in a large-scale project in the solar, wind and biomass. These will enhance the financial structure, lower cost of capital and help achieve renewable energy goals of the country.

- Concessional Loans & Blended Finance: Bangladesh must increase the concessional loans programs of the development partners like World Bank, ADB and JICA to reduce the cost of capital to renewable energy projects. These concessional funds when combined with commercial bank funds in blended finance structures would help lower financing costs, bring in the participation of the private sector and enhance the financial feasibility of large scale solar, wind and biomass projects. This strategy facilitates sustainable investment and boosts the introduction of renewable energy.
- Public-Private Partnerships (PPPs): To attract investment of the private sector, Bangladesh should design risk-sharing PPP contracts on offshore wind, waste-to-energy and large-scale solar projects to reduce the financial and operational risks. Also, corporate PPAs should be promoted to install solar rooftops on industries to further increase distributed renewable energy production and offer developers a predictable income and decarbonize industries. Such strategies help create partnership between government and business investors so that there can be a scalable and sustainable implementation of renewable energy.
- Domestic Manufacturing Incentives: To decrease the importation and enhance the local renewable energy supply chain, Bangladesh ought to give tax exemptions and duty-free incentives to develop domestic solar panel and inverter assembly plants. The localization of supply chain by co-establishing a joint venture with international technology providers can be supportive in terms of increasing the expertise locally, providing employment and making the renewable energy industry more cost-effective and resilient.

4.3 Institutional Strengthening

- Capacity Building: Bangladesh needs to create special procurement departments in SREDA, BPDB, BPMI and the Power Cell that is focused on handling renewable energy projects. Managers of such units are supposed to be provided with specific training on the global best practice in renewable energy purchasing with the assistance of the technical expertise of such organizations as IFC and IRENA. This form of institutional capacity building will also help in strengthening project planning, tender management and contract execution which will eventually lead to efficiency, transparency and timely implementation of renewable energy projects.
- Regulatory Reforms: To promote the development of renewable energy, Bangladesh ought to amend the Public Procurement Act (2006) with the introduction of RE-specific features, such as the lifecycle cost assessment and the sustainability requirements. Also, empowering the Bangladesh Energy Regulatory Commission (BERC) will improve the transparency of tariffs guarantee reasonable prices and give investors more confidence. Such regulatory changes will establish a more favorable and effective climate in the renewable energy acquisition and project implementation.
- Stakeholder Collaboration: Bangladesh needs to form a Renewable Procurement Taskforce that includes the representatives of government agencies, the private sector, financial institutions and civil society. Such multi-stakeholder platform will be able to support the coordinated decision-making process, increase the level of transparency and make sure that procurement strategies are driven by technical and socio-economic

factors. The taskforce will facilitate effective project implementation, risk reduction and scaling up of renewable energy implementation in the country by encouraging cross-sector collaboration.

4.4 Technological Integration

- Battery Energy Storage Systems (BESS): To control the unpredictability of the renewable energy and to increase the stability of the grid, Bangladesh needs to acquire grid-scale battery energy storage systems via international competitive bidding. The feasibility of hybrid projects (e.g. solar and storage) can be piloted to stabilize grid changes, optimize energy dispatch, and offer useful insights to the scaling up of storage-integrated renewable energy solutions nationwide.
- Smart Grid Procurement: To adequately address fluctuations in renewable energy, Bangladesh ought to invest in SCADA technology, computerized stations and smart meters that will increase the monitoring and control of the grid. Also, the acquisition of AI-based demand forecasting tools should be considered a priority that will help manage the load, optimize energy dispatch, and facilitate the inclusion of variable renewable energy in the national grid. Such intelligent technologies will ensure that the grid is more resilient and will allow more efficient and reliable deployment of renewable energy.
- Offshore Wind Supply Chains: To ensure the establishment of an offshore wind pilot project of 500 MW at Matarbari, Bangladesh needs to invest in port facilities and special logistics infrastructure that will enable delivery of large turbines and subsea equipment. The use of the public-private partnership (PPP) procurement models to engage the global suppliers of turbines will ease technology transfer, minimise risks involved in the projects and ensure timely delivery of the projects. This will strengthen offshore wind supply chains, which will allow the deployment of Bangladesh high-potential marine renewable energy resources to be scalable.

4.5 Policy and Legal Recommendations

- Land Use Reform: Bangladesh needs to develop a National Renewable Land Bank to resolve land scarcity issues of renewable energy projects by identifying and mapping non-agricultural lands that can be used to install solar and wind energy facilities. Also, the focus on the further development of floating solar projects on reservoirs can reduce land conflicts and optimize the use of resources, as well as reduce the pace of renewable energy implementation without affecting the productivity of agriculture.
- Payment Security Framework: To improve investor confidence and project bankability, Bangladesh ought to develop Renewable Energy Payment Guarantee Fund where independent power producers (IPPs) will be paid in time. There should also be efforts to shorten the average payment time of more than 90 days to below 30 days. Enhancing the payment security will encourage both the foreign and domestic investment to ensure that renewable energy projects are financially viable and the transition process of clean energy in the country will be faster.
- Fiscal Incentives: To enhance local production and installation of renewable energy devices, the government of Bangladesh ought to offer 10-year tax exemptions on the

production of RE gadgets. Also, by waiving VAT on the importation and installations of battery energy storage systems (BESS), an investor can reduce upfront costs, and the administration of scale-up of storage-integrated renewable energy projects can be promoted. The financial appeal of renewable energy programs and local supply chains will improve because of these fiscal considerations. Such as-

- Extend 10-year tax holidays for RE equipment manufacturing.
- Waive VAT on BESS imports and installation.

4.6 RE Scaling Up Measures

The renewable energy procurement roadmap in Bangladesh has equilibrium targets and strategic focus areas in an annual basis to gradually increase the capacity. In 2025, the target will be based on 400 MW in which utility-scale solar and rooftop net metering should be considered. The additions should be at least 750 MW annually between 2026 and 2030, with the emphasis on competitive auctions, rooftop solar and biomass. From 2031 to 2041, the target raises to 1,000 MW per year to prioritization of the offshore wind, floating solar and energy storage integration. The above will be expanded to 1,500 MW per year beyond 2041 in green hydrogen, tidal, river current and hybrid renewable units.

The global experiences can provide lessons to Bangladesh. The clear solar and wind auctions in India have increased the capacity faster and lowered the tariffs. The offshore wind development in Vietnam through the relation of public-private partnerships (PPP) has proven a good example of sharing risks and the management of long-term contracts. The use of feed-in tariffs in biomass in Indonesia guarantees the certainty of the returns of investors and the fact that solar procurement is combined with energy storage in Morocco contributes to the stability of the grids and reliability of the projects. All these points above imply that a supportive fiscal policy and well-organized risk-sharing tools with a clear set of procurement rules are all that Bangladesh needs to implement renewable energy on a rapid and sustainable scale.

4.7 Recommendations

To ensure the speed-up of renewable energy (RE) development in Bangladesh, the overall procurement and implementation framework needs to be improved in terms of efficiency, transparency, and investor-friendliness. It is suggested that the following are the main recommendations that should be made to enhance the contribution of RE to the national power sector in accordance with the effective procurement practices:

The simplification of Procurement Processes: The Procurement processes should be simplified by introducing a single-window approval system to reduce the time lag in the processes and to avoid duplication of clearances by different agencies. The increased application of the e-Government Procurement (e-GPS) platform in all the bidding solicitation procedures to contract management will entail increased transparency, traceability and less processing time.

Adopting Competitive Auctions: Bangladesh needs to institutionalize the use of competitive auctions of renewable energy project at an indicative level of 750 MW of new capacity per year. These auctions ought to embrace the global best practices like the reverse bidding model

in India to increase the competitiveness of the market, fair price discovery and the overall cost of generating this renewable power will be minimal.

Empowering Sustainable Financing: Sustainable financing should be increased by using various instruments like green bonds, concessional loans by the development partners and the public-private partnership (PPP). Also, the introduction of risk mitigation instruments such as sovereign guarantees or partial risk guarantees those can increase the project bankability and can increase investment by the private-sector.

Encouraging Local Production: Importation of equipment required in renewable energy (RE) projects should be discouraged and instead, local production of solar panels, inverters, wind turbine components, and battery storage systems should be encouraged. This can be supported by the government through the introduction of fiscal incentives, tax rebates and technology transfer joint ventures with foreign companies which will in turn lead to the development of competitive domestic renewable energy industry.

Adoption of New Technologies: Procurement planning needs to focus on the implementation of new technologies to enhance grid reliability through the introduction of Battery Energy Storage Systems (BESS) and smart grids to overcome the intermittency of supply and challenges of peak demand.

Strengthening Institutional Capacity and Governance: Strengthening the capacity of important institutions including SREDA, BPDB, BPMI and Power Division that is critical in the management of complex renewable energy projects. PPA and PPR need to be revised to contain certain provisions in the area of renewable energy contracting like lifecycle cost assessment and flexible payment structures.

In addition, the security of payments such as escrow accounts, credit enhancement facilities will enhance investor confidence and sustainability of the project. These are all measures that are likely to enhance procurement governance, enhance operational efficiency and create a sustainable renewable energy ecosystem. This will, in turn, help Bangladesh to meet its national goals of energy transition as well as meet its global climate obligations.

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Appendix A: Case Study of Solar Power Project

The 75 MW Solar Power Plant in Sonagazi, Feni, and carried out by a state owned power generation company, is an example of the many procedural and procurement challenges that may be faced in large scale renewable energy projects in Bangladesh. It is in this project that compliance with both national and international regulations on procurement and transparency, competitiveness and accountability can unwillingly extend the time of implementation. The requirement of the several administrative levels of approval, adherence to international tendering standards and excessive dependence on imported materials all helped in slowing down of the procedures.

Sonagazi project provides significant insights about renewable energy acquisition in Bangladesh. It reveals the two sidedness of organized possibilities of effective delivery of the projects and the bottlenecks that occur in the operations due to bureaucratic and logistical restraints. Further, the case highlights a long-standing lack of alignment between policy goals and real-life implementation in the country of managing renewable energy projects. The main Project Schedule (Sonagazi 75 MW Solar Power Plant) includes the following:

Serial No.	Major Events	Date
1	Primary Site Identification for Solar Project Development	2015
2	Assessing Primary viability of site by conducting Pre-Feasibility Study	2015
3	Obtaining In-principal approval and administrative approval from Power Division	31-May-15
4	Submission of Proposal to DC Office for Land Acquisition and submission of land acquisition DPP to Power Division	2016
5	Approval of land acquisition DPP	2016
6	Submission of PDPP to Power Division for searching fund	2016
7	Obtaining PDPP approval from Planning Commission and starting discussion with various development partners (DP)	2017
8	Completion of Land Acquisition	2017
9	Gazette notification of land acquisition	19-Oct-17
10	Engagement of Consultant for Conducting Detail Feasibility Study, ESIA, DIA and RAP	2017
11	Completion of Detail Feasibility Study, ESIA, DIA and RAP by Consultant	2018
12	Discussion with DP for financing in Project and obtaining primary consent from DP	2018
13	Upon obtaining primary consent from DP, submission of DPP to Power Division for “solar power plant project”	2018
14	PSC Meeting and PEC Meeting on DPP	2018
15	“Solar power plant project” DPP approval by ECNEC	7-Nov-18
16	Issuance of Project approval GO by Power Division	19-Dec-18
17	DP (WB) Board Approval of Project	1-Mar-19
18	Financing Agreement Signing between GOB and DP (WB)	29-Aug-19
19	SLA signing between Finance Division and EA	26-Nov-19
20	DP (WB) Loan Effective	8-Dec-19

Serial No.	Major Events	Date
21	Invitation of EOI for selection of consultant (Owner's Engineer) through QCBS method	2019
22	Invitation of International Open Tender (Single Stage Two Envelope Bidding) for selection of EPC Contractor	13-Dec-19
23	Completion of Technical Evaluation and obtaining approval from EA Company's Board and NOC from DP (WB)	2020
24	Completion of Financing Evaluation and obtaining approval from EA Company's Board and NOC from DP (WB)	2021
25	Signing of Owner's Engineer contract with selected consultant	2021
26	EPC Contract Signing	15-Jun-21
27	Contract Effective Date	15-Sep-21
28	Topographic Survey, Soil Test & Final Route Survey of Transmission Line conducted	30-Dec-21
29	Transmission Line route & route profile drawings completed	20-Mar-22
30	All Transmission Line Tower Materials arrived at site	20-Nov-22
31	Piling of Main Access Road Bridge, Administrative Building and Foundation works of Inverter Station completed	30-Apr-23
32	Pre-cast piling of control room building completed. Control room building roof casting completed.	30-Apr-23
33	100% materials (PV Module, Inverters, Module Mounting Structures, Power Transformers, Inverter Transformers etc.) arrived at site.	15-May-23
34	Pre-Commissioning Tests completed. Back feed power received at site	19-Feb-24
35	Power plant started supplying electricity to national grid. Plant is now operating at full capacity	24-Feb-24
36	Reliability Run Test completed	31-Mar-24
37	Project completed and closed	30-Jun-24
38	PCR Submission	30-Sep-24

Case Analysis: The project timeline reveals that although preliminary activities such as site identification and pre-feasibility studies were completed in 2015, key project milestones including land acquisition, DPP approval and financing agreements, took nearly four years to finalize (2015-2019). The long approval process, having several bodies of the government and liaising with developmental partners like the World Bank made the implementation of the project very time consuming. The international competitive bidding of procurement of consultants and EPC contractors also increased the schedule as technical and financial assessments were carried out lengthy. Also, reliance on imported components like photovoltaic (PV) modules, inverters and transformers, led to further delays in the logistical processes. Consequently, pre-commissioning works were not finalized until early 2024 and the plant started operating in full scale in February 2024.

The case shows that, though strict procurement processes ensure transparency and accountability, it is also one of the factors that lead to the delay of projects. Efficiency and effectiveness in the administrative procedures, reinforcing local supply chains and incorporating quicker approval systems are thus the key to ensuring the realisation of the renewable energy development objectives in Bangladesh in an efficient and sustainable manner.