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Catalysing Renewable Energy Finance in Bangladesh

Risk mitigation instruments and policy certainty can accelerate the flow of finance into Bangladesh's renewable energy sector

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Contents

Figures and Tables

Key Findings

Bangladesh will require up to US$980 million annually until 2030 to meet the goal set out in the Renewable Energy Policy 2025. Post-2030, the country will need up to US$1.46 billion annually until 2040.

Policy uncertainty, offtaker and currency risk, land acquisition challenges, and a downgraded sovereign rating may limit capital flows into the renewable energy sector in Bangladesh.

A credit risk guarantee scheme, a dedicated green finance facility with scope for pre-finance, and an import duty waiver on solar accessories can help accelerate the flow of finance for small-scale renewable energy projects.

The country needs to create an enabling environment for investment in utility-scale projects through streamlined policy and regulations.

Executive Summary

Bangladesh stands at a pivotal moment in its renewable energy transition, with potential to significantly reduce its dependency on costly fossil fuels. As its power sector subsidies are likely to surge by 55% year-on-year in the fiscal year (FY) 2024-25, increasing the country's renewable energy capacity is crucial.

The government has approved a new Renewable Energy Policy, which significantly raises the country's clean electricity ambitions. The new target is to generate 20% and 30% of electricity from renewable energy sources by 2030 and 2040, respectively. Our ballpark estimates suggest the country requires between US$933 million and US$980 million annually until 2030 to meet the new target. Post-2030, the country will need between US$1.37 billion and US$1.46 billion annually until 2040. Public finance is unlikely to entirely meet these funding requirements, necessitating large-scale private investment.

However, there are several challenges to attracting private investment in Bangladesh's renewable energy sector. Policy and regulatory changes, off-taker risk, technology and performance risk, weak project pipelines, a cumbersome loan disbursement process, land acquisition challenges, currency volatility, and lower sovereign rating limit capital flows into the sector.

Abrupt policy changes have dented investor confidence, minimising the inflow of foreign capital. Local investors and sponsors are not keen to invest in utility-scale renewable energy projects due to the lengthy land acquisition process. The removal of the "implementation agreement" clause, similar to a sovereign guarantee, deters them from submitting proposals against the government's tenders. On the debt front, Bangladesh's low credit ratings will increase the cost of foreign loans, which are essential for the country's economic growth and energy transition. The devaluation of the Bangladeshi Taka by a massive 27% against the US dollar between May 2022 and January 2025 further complicates project financing. Loans are even more difficult to secure for small projects. Financial institutions often demand high collateral and perceive small-scale projects as risky, limiting access to financing for such initiatives. High import duties on renewable energy system components add to the cost of small-scale projects.

The government can earmark land for utility-scale projects through proper resource mapping. It can also address land acquisition challenges through the Public-Private Partnership model. This can help mobilise private investment in renewable energy through special economic zones, thereby circumventing land acquisition uncertainties. Policy certainly and a gradual transition from unsolicited project award to a competitive bidding process will help attract the consistent investment the sector needs until 2040 (See Figure 1).

The government can help establish a currency hedging facility to mitigate currency risk. Multilateral Development Banks (MDBs), international climate finance institutions and bilateral development financial institutions can support the creation of this facility. The Bangladesh government may reinstate the "project implementation clause" as a sovereign guarantee, dispel any uncertainty over

payment owing to the Bangladesh Power Development Board's hefty subsidy burden or establish a funding mechanism to provide revenue assurance to renewable energy producers, mitigating counterparty risks.

To accelerate renewable energy investments, the government can actively engage with MDBs to secure concessional funding, which can lower the cost of capital for projects and, therefore, attract private investment.

A low-cost dedicated renewable energy financing scheme can support small-scale projects, such as rooftop solar and solar irrigation. Since traditional financial institutions are reluctant to finance small-scale projects in rural areas, Bangladesh Bank can consider allowing Micro Finance Institutions to access low-cost green funds.

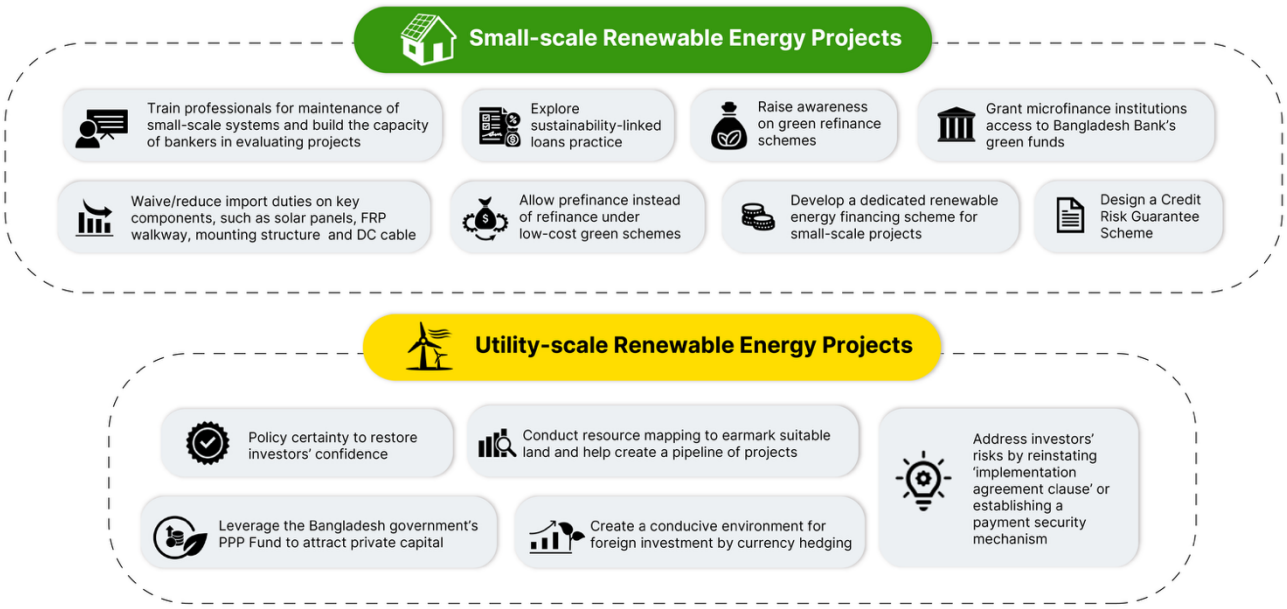
Pre-finance instead of refinance can incentivise building owners to avail Bangladesh Bank's green refinance schemes. As Bangladesh Bank has changed the terms and conditions of green refinance schemes several times in recent years, raising awareness will help end users utilise these low-cost loan facilities.

While the government has reduced import duty on inverters, it should consider doing the same for other key components of small-scale solar projects.

The Sustainable and Renewable Energy Development Authority can implement a capacity-building programme to develop the technical capacity of service providers and ensure the effectiveness of small-scale projects. It can further develop the capacity of bankers to finance small-scale distributed renewable energy projects.

The transition to renewable energy in Bangladesh is not merely imperative for decarbonisation; it is an economic necessity. Policy and regulatory reform, institutional development, and low-cost financing can position Bangladesh as a low-carbon economy and a climate leader in the Global South. The government, international organisations, financial institutions, private investors, and renewable energy companies should collaborate to create a conducive environment that fosters innovation, investment and sustainable growth.

Figure 1: Recommendations to Accelerate Renewable Energy Financing



Background

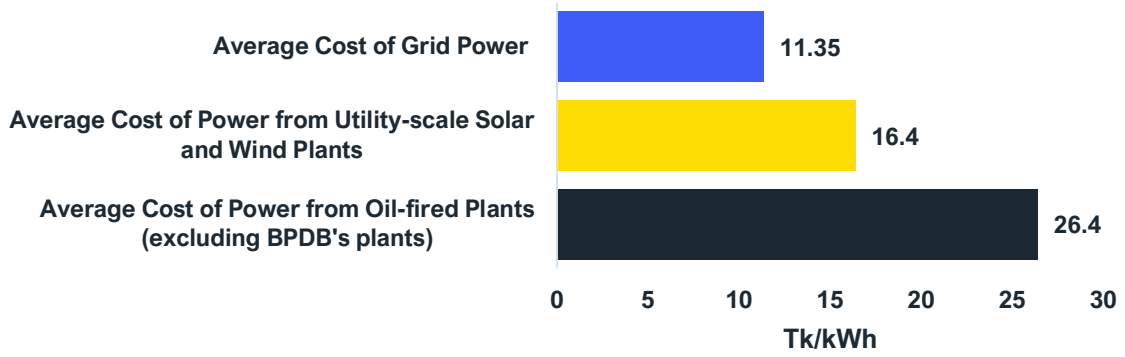
The Bangladesh government announced the new Renewable Energy Policy on 16 June 2025, which outlines comparatively ambitious targets than the ones set in 2008.[1] Under the new policy, the country aims to generate 20% and 30% electricity from renewable energy sources by 2030 and 2040, respectively. Enhancing the contribution of renewable energy to 30% from the current share of less than 5% (grid-connected) by 2040, warrants sustained measures. The increasing competitiveness of renewable energy makes it a compelling choice for Bangladesh to meet part of its energy demand affordably while contributing to the country's decarbonisation efforts.

The state of Bangladesh's power sector also highlights the urgent need for renewable energy expansion. The sharp depreciation of local currency and volatile fossil fuel costs have taken a toll on the country's economy. Bangladesh's energy cost has risen significantly in recent years, causing financial hardship for energy importers. The Bangladesh Power Development Board (BPDB), which is responsible for generating around half of the country's grid-based power and purchasing the remaining from domestic and foreign power producers, is financially distressed. BPDB relies on hefty government subsidies to bridge the gap between the generation/purchase cost and the selling price. To further compound the situation, the subsidy burden has surged to Bangladeshi Taka (Tk) 620 billion (US$5.08 billion) in the fiscal year (FY) 2024-25, registering a year-on-year rise of a staggering 55%.[2,3]

The power sector's overhaul could present an opportunity for Bangladesh to ramp up renewable energy capacity and reduce its dependence on costly fossil fuels. For instance, oil-fired peaking plants produced the most expensive power in FY2023-24 at an average cost of Tk26.4/ kilowatt-hour (kWh) (US$0.216/kWh) as opposed to the average grid power generation cost of Tk11.35/kWh (US$0.093/kWh). Solar and wind plants combined produced power at an average cost of Tk16.4/kWh (US$0.134/kWh) during the same period (see Figure 2).[4,5] Oil-fired plants contributed to more than 10% of grid-based power in the last fiscal year.[6] Renewable energy can replace oil-fired power at least during the daytime, minimising average power generation cost and reducing subsidy requirements. By integrating battery energy storage, Bangladesh can reduce the use of costly oil-fired plants even during evening peak hours.

[1] Ministry of Power, Energy and Mineral Resources (MPEMR). Gazette on Renewable Energy Policy 2025. 16 June 2025.
[2] The Daily Star. Revised Budget for FY25: Power, Fertiliser Subsidies to Ballon. 16 March 2025.
[3] 1Tk = 0.0082US$
[4] BPDB. Annual Report 2023-24. 15 October 2024.
[5] Average cost of power from renewable energy and oil-fired plants are calculated based on data of individual plants. (see Annexure-2 for sample calculations)
[6] IEEFA. Fixing Bangladesh's Power Sector. 4 December 2024.

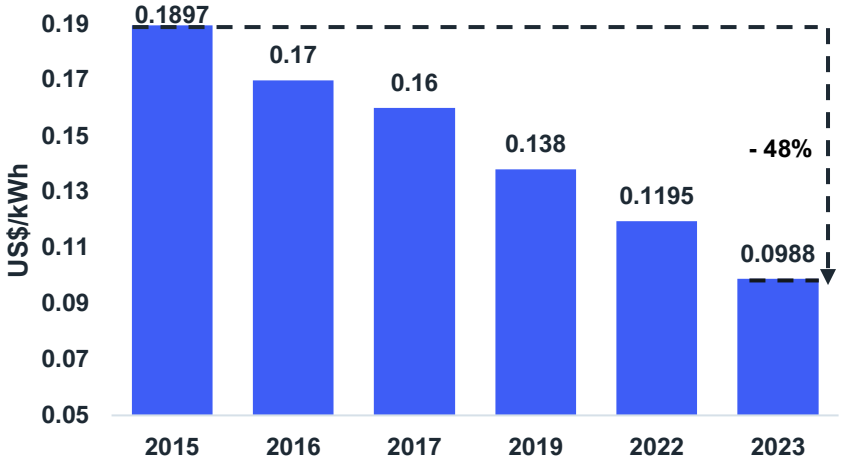
Figure 2: Comparison of Power Generation Costs, FY2024



Sources: BPDB; IEEFA's Analysis.

Bangladesh's tariffs for utility-scale solar fell by 48% between 2015 and 2023 (see Figure 3). With the government transitioning to a competitive renewable energy procurement process, the tariffs of utility-scale renewable energy will likely fall further, making it financially more attractive. Besides, the cost of energy from rooftop solar hovers around Tk5/kWh (US$0.041/kWh).[7]

Figure 3: Falling Trend of Tariffs of Utility-scale Solar Projects



Sources: Dhaka Tribune; Energy Bangla; The Business Standard; The Daily Star; The Business Standard; IEEFA's Analysis.

However, Bangladesh continues to struggle to shore up renewable energy capacity due to land constraints and financing challenges. While the country mostly relied on Multilateral Development Banks (MDBs), bilateral financing agencies and local financial institutions to support renewable energy projects in the last decade, the overall flow of finance into the sector remained low. Foreign

[7] Source: KII

Direct Investment (FDI) also played a limited role. The lack of a conducive policy environment affected renewable energy financing in the country. For instance, the recent policy change in renewable energy procurement, i.e., an abrupt shift to competitive bidding from the previous process of accepting unsolicited proposals, has dented investors' confidence. Further, as Moody's recently downgraded Bangladesh's credit ratings, the country may face constraints in raising foreign funds at affordable rates to expand renewable energy capacity.[8] These factors might affect financing, leading to a slowdown in renewable energy project development in Bangladesh.

This study assesses the current state of renewable energy financing in Bangladesh, including challenges and opportunities in the sector. It offers solutions to address the challenges and accelerate capital flow into the sector. This study builds on extensive stakeholder consultation and key informant interviews (KIIs).

Present Renewable Energy Capacity and Targets

Current Installed Renewable Energy Capacity

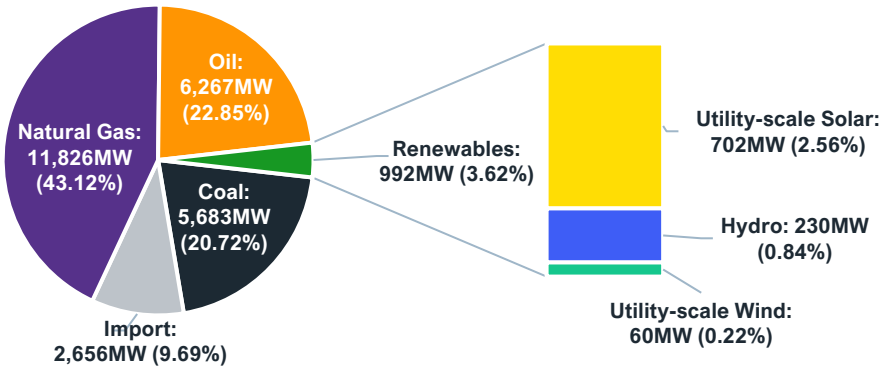
Bangladesh's renewable energy sector is at a nascent stage, with its contribution to the national grid standing at 992 megawatts (MW) (3.62% of the power system capacity) in April 2025 (see Figure 4A).[9] The combined renewable energy capacity rises to a meagre 1,559MW (5.07% of the power system capacity) if small-scale systems, including solar home, rooftop solar and solar irrigation systems, are added (see Figure 4B).[10] However, renewable energy contributes to less than 2% of the country's grid-based power generation (see Figure 4C).[11]

With a share of 70.77%, solar dominates Bangladesh's grid-connected renewable energy, followed by hydropower (23.18%) and wind (6.05%).[12] Likewise, solar contributes to 81.2% of renewable energy capacity, including off-grid systems.[13]

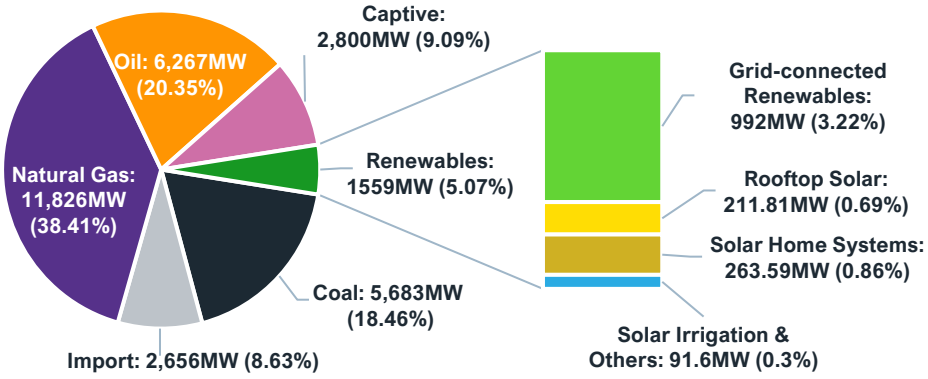
[8] New Age. Moody's Cuts Bangladesh's Credit Ratings Further. 18 November 2024.
[9] BPDB. Key Statistics. April 2025.
[10] Sustainable and Renewable Energy Development Authority (SREDA). Renewable Energy Installed Capacity. April 2025.
[11] BPDB. Annual Report 2023-24. 15 October 2024.
[12] Contribution of Solar (702MW*100/992MW = 70.77%); Contribution of Hydropower (230MW*100/992MW = 23.18%); Contribution of Wind (60MW*100/992MW = 6.05%).
[13] Contribution of Solar when off-grid systems are considered (1,265MW*100/1,559MW = 81.2%)

Figure 4: Share of Renewable Energy in Bangladesh's Total Installed Power Capacity and Generation Mix

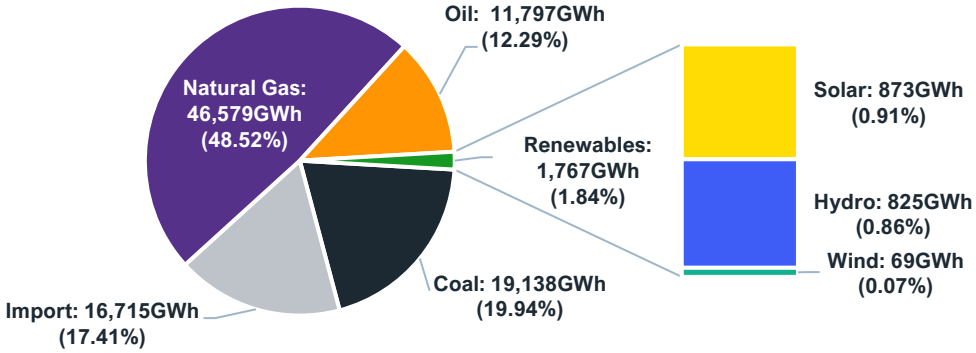
A. Contribution of Utility-scale Renewable Energy, April 2025



B. Contribution of Renewable Energy with Small-scale Systems, April 2025



C. Contribution of Renewable Energy to Power Generation, FY2023-24



Sources: BPDB; SREDA; IEEFA's Analysis.

Renewable Energy Targets

In 2008, Bangladesh formulated its first renewable energy policy, which set a modest goal of meeting 10% of the country's power demand from renewable energy sources by 2021.[14,15] However, the country fell short of its target due to land acquisition challenges, financing bottlenecks, and the absence of a favourable regulatory environment.

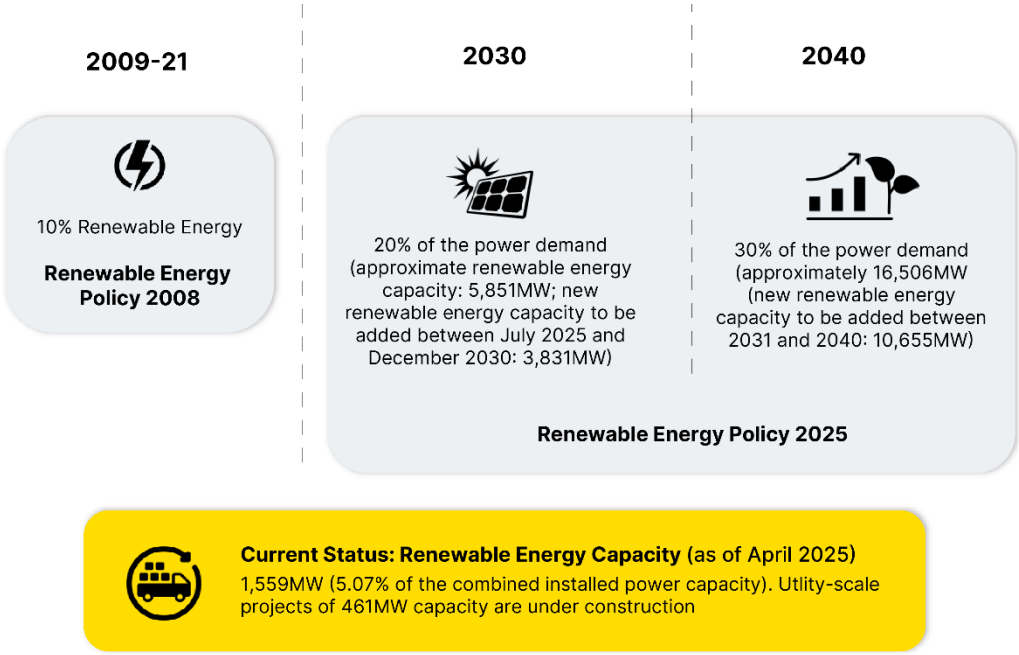
The new Renewable Energy Policy has set targets of generating 20% and 30% of electricity from renewable energy sources by 2030 and 2040, respectively.[16] Based on the power demands of 2030 and 2040, as projected in the Integrated Energy and Power Master Plan (IEPMP) 2023, the country will likely need to install cumulative renewable energy capacities of 5,851MW and 16,506MW by 2030 and 2040, respectively.[17,18,19,20]

As current installed renewable energy capacity stands at 1,559MW and utility-scale projects of 461MW are under construction, Bangladesh needs to increase renewable energy capacity by 21.3% per annum between July 2025 and December 2030 to attain 5,851MW by 2030, and by 10.9% per annum between 2031 and 2040 to reach 16,506MW by 2040 (see Annexure 3 for calculation).

While the new renewable energy policy does not offer details of technology composition, solar is likely to play a dominant role in the country's total renewable energy capacities in 2030 and 2040, respectively. The new policy demonstrates the government's willingness to increase renewable energy capacity. However, unless the government addresses existing barriers – including financing challenges – to adopt renewable energy, the country may again fall short of its renewable energy goals.

[14] MPEMR. Renewable Energy Policy of Bangladesh. 18 December 2008.
[15] While the Renewable Energy Policy stipulated that the 10% target to be achieved by 2020, the government changed the target year to 2021.
[16] MPEMR. Gazette on Renewable Energy Policy 2025. 16 June 2025.
[17] MPEMR. Integrated Energy and Power Master Plan (IEPMP) 2023. July 2023.
[18] MPEMR. Gazette on Renewable Energy Policy 2025. 16 June 2025.
[19] Bangladesh's maximum power demand may reach 29,257MW in 2030 under the perspective plan scenario. As such, 20% renewable energy capacity by 2030 is (29,257MW X 20%) = 5,851.4MW = 5,851MW (approximately).
[20] Bangladesh's maximum power demand may reach 55,020.65MW in 2040 under the perspective plan scenario (estimated from the demand of 2041). As such, 30% renewable energy by 2040 is (55,020.65MW X 30%) = 16,506.2MW = 16,506MW (approximately).

Figure 5: Renewable Energy Targets



Sources: SREDA; Power Division; BPDB; IEEFA's Analysis; Note: While the renewable energy capacities to meet the 2030 and 2040 targets are calculated based on IEPMP's demand projections, these numbers may vary once the IEPMP is updated.

Prevailing Renewable Energy Financing Scenario

Despite the growing competitiveness of renewable energy, it has attracted limited investment in Bangladesh. For instance, between 2009 and 2022, the country's power sector received investments worth US$30 billion.[21] Most of this investment helped spur new fossil-fuel-based capacity addition of 16,800MW.[22,23,24] On the contrary, renewable energy capacity grew by less than 1,000MW between 2009 and 2022, substantiating a paltry investment in the sector compared with fossil fuels.[25] Another report estimated that Bangladesh invested a meagre US$1.43 billion in clean energy during 2018-23.[26]

[21] The Business Standard. Power Sector Fetches $30b in Last 13 Years: Nasrul. 13 June 2023.
[22] BPDB. Annual Report 2008-09. 2 August 2009.
[23] BPDB. Daily Electricity Generation Report 31 December 2022. 1 January 2023.
[24] Installed power generation capacity excluding renewable energy in June 2009 = 5,493MW – 230MW = 5,263MW; Installed power generation capacity excluding renewable energy in December 2022 = 22,608MW – 230MW – 35MW – 7MW – 20MW – 3MW – 50MW – 100MW – 6MW – 8MW – 30MW = 22,119MW; Approximate fossil fuel-based capacity expansion = 22,119MW – 5,263MW = 16,856MW
[25] Renewable energy Capacity, including off-grid systems, in April 2025 = 1,559MW; Hydro-electric power plants of 230MW were installed before 1990. Between January 2023 and February 2025, utility-scale renewable energy projects of 503MW (762MW-259MW) capacity became operational. This means that Bangladesh added renewable energy of less than 1,000MW capacity between 2009 and 2022.
[26] BloombergNEF. Climate Scope – Bangladesh. November 2024.

Historically, the Bangladesh government, international development partners like the World Bank, Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB) and Japan International Cooperation Agency (JICA), government-owned public financial institutions, and Foreign Direct Investment (FDI) have played an instrumental role in catalysing capital for fossil fuel projects.[27] Local and international commercial banks started financing fossil fuel projects in the country during the last decade and a half.[28] While private investment in the energy sector increased in the last decade, pension funds and insurance companies have not invested in the energy sector. The funding profile of the renewable energy sector is similar to that of the energy sector – it relies heavily on public financing, including government, multilateral and bilateral financial institutions.[29]

Financing Sources in Utility-scale Projects

Debt Finance

MDBs, bilateral financial agencies and the Infrastructure Development Company Limited (IDCOL) are the primary sources of debt finance for Bangladesh's utility-scale renewable energy projects (see Table 1 for details).

The World Bank, ADB, AIIB, and bilateral agencies, like JICA and Kreditanstalt für Wiederaufbau (KfW), are some of the main debt financers for renewable energy projects. Through their climate financing initiative, MDBs have contributed significantly to the country's green energy expansion. MDBs have provided capital directly for renewable energy projects and through financial intermediaries. The publicly owned IDCOL, which has access to MDB funds, has also provided debt finance to renewable energy projects and raised debt finance as a lead arranger.[30,31]

The Investment Promotion & Financing Facility (IPFF), supported by the World Bank, has also provided debt finance.[32] Besides, a Bangladeshi private company issued a green sukuk – an Islamic bond – to fund the largest solar project of 200MW capacity (see Table 1 for details).[33]

[27] KII.
[28] Ibid.
[29] Ibid.
[30] Daily Sun. Sympa Solar, IDCOL Ink Term Loan Deal. 15 October 2018.
[31] The Business Standard. 100MW Green Plant Coming up Opposite Rampal Coal Plant. 3 October 2019.
[32] Dhaka Tribune. One Bank Arranges Syndicated IPFF II Facility of $17.8 Million for Teknaf Solartech. 20 March 2022.
[33] City Bank Capital. City Bank Capital Introducing the Debut Beximco-Green Sukuk Al Istisna'a. 2021.

Table 1: Types of Debt Financing in Bangladesh's Utility-scale Renewable Energy Projects

Examples of Debt Financing in the Existing Utility-scale Projects	Terms
Multilateral Development Banks' Foreign Currency Loan:	
• The World Bank's loan to the Government of Bangladesh for on-lending to a generation company (BPDB's subsidiary)[34] • ADB's loan to the Government of Bangladesh for on-lending to BPDB[35]	**Debt-Equity Ratio**: 80:20 (may vary)[36] **Interest Rate**: World Bank: 3% interest rate applicable for the Government of Bangladesh + the margin charged by the government for on-lending;[37] ADB: The rate is similar to the World Bank.[38] **Loan Tenor**: 20 years (may vary)[39]
Multilateral Development Banks' Local Currency Loan:	
ADB's loan combined with Amsterdam-based private fund and JICA's fund to private project developers[40]	**Debt-Equity Ratio**: 80:20 (may vary) **Interest Rate**: Lower than prevailing market rate **Loan Tenor**: 20 years (may vary)[41]
Local Financial Institutions:	
IDCOL: • IDCOL on-lends to private projects (funding source: MDBs) [42] • IDCOL acts as an arranger where MDBs participate **Bank**: Agrani Bank provided a loan to a power generation company (subsidiary of BPDB) **Green Delta Capital**: It arranged finance from ADB and KfW for a private sector project	**Debt-Equity Ratio**: 60:40 to 80:20 (may vary) **Cost of Debt**: IDCOL: Usually commercial terms but lower than the market rate Agrani Bank: Usually commercial terms **Loan Tenor**: 15 to 20 years.[43]
Investment Promotion & Financing Facility (IPFF):	
Supported by the World Bank and managed by Bangladesh Bank, the IPFF was available for on-lending by local financial institutions (**Note**: This fund is no longer available)	**Debt-Equity Ratio**: 75:25 **Cost of Debt**: US$ loan: USD 10-year SWAP OIS + 50 Basis Point (bp)

[34] World Bank. Financing Agreement (Bangladesh Scaling-Up Renewable Energy project) between People's Republic of Bangladesh and International Development Association. 29 August 2019.
[35] BPDB. Semi-annual Environmental Monitoring Report - Power System Efficiency Improvement Project Part B (i) – Kaptai 7.4 MW Solar PV Plant. December 2019.
[36] KII.
[37] World Bank. Financing Agreement (Bangladesh Scaling-Up Renewable Energy project) between People's Republic of Bangladesh and International Development Association. 29 August 2019.
[38] KII
[39] Ibid.
[40] The Business Standard. ADB to Finance 121.55m for Private Solar Plant in Pabna. 30 April 2024.
[41] KII.
[42] The Business Standard. Bangladesh Signs $200m Loan Agreement with AIIB. 1 May 2022.
[43] KII

	Local Currency Loan: Yield of the Bangladesh government's 364-day T-bill + 100 bp[44] **Loan Tenor**: Up to 20 years
Green Sukuk[45]:	
(Issued by Beximco Green-Sukuk Trust-Special Purpose Vehicle to implement two solar projects and invest in Beximco's **textile** industry**. The local company,** Beximco, **was** the originator of the sukuk and provide**d** equity. The size of the sukuk was Tk30 billion (US$246 million), of which TK18.86 billion (US$154.65 million) was used for the 200MW solar project).	**Debt-Equity Ratio**: 75:25 **Cost of Debt**: 9% + additional profit **Tenor**: 5 years[46]

Sources: World Bank; ADB; AIIB; IDCOL; Bangladesh Bank; KII; IEEFA's Analysis.

Equity Finance

For public sector renewable energy projects, the relevant government organisation, such as BPDB or its subsidiaries, provides equity capital in the form of land, which is difficult to acquire. In the private sector, domestic sponsors, i.e., promoters/owners of the projects, provide equity capital. Besides, foreign investors also participate as equity investors; local project sponsors seek long-term foreign equity investment of 20 to 25 years. The 60MW wind power project implemented in Bangladesh, supported by Chinese investment, is an example of foreign investment.[47]

Financing Sources in Small-scale Projects

Small-scale renewable energy projects often face challenges in acquiring traditional loans. Most of the funding comes from concessional loans, refinance schemes and grants.

Debt Finance

IDCOL offers grant and concessional debt capital to promote solar home systems in rural and off-grid areas. As the government has expanded the grid to areas that were previously off-grid, solar home systems will not play a major role in the country. Currently, rooftop solar dominates the small-scale renewable energy segment in Bangladesh.

Building owners occasionally take commercial loans from financial institutions for rooftop solar projects. They prefer IDCOL's low-cost loans, offered at a 6% interest rate per annum.[48] They can also utilise Bangladesh Bank's green refinance schemes available at up to 5% interest rate per annum.[49] Green funds offer the most affordable debt financing among locally available options in the

[44] Bangladesh Bank. Investment promotion & Financing Facility II (IPFF II) Project Cell. May 2025.
[45] City Bank Capital. https://bexgreensukuk.com/download/Teaser-Beximco_Green_Sukuk_al-Istisna'a.pdf. 2021.
[46] Ibid.
[47] The Daily Star. The Wind of Change. 8 July 2023.
[48] IDCOL. Rooftop Solar. March 2025.
[49] Bangladesh Bank. Quarterly Review Report on Sustainable Finance. March 2025.

country. Three refinance schemes, including Tk10 billion (US$82 million) for 70 types of environment-friendly projects, a Green Transformation Fund (GTF) of Tk50 billion (US$410 million) for industries and a refinance scheme of Tk1.25 billion (US$10.25 million) channelled through Islamic banks and financial institutions, are suitable for small-scale renewable energy projects. However, building owners need to follow a two-step process to avail of these low-cost refinance schemes. First, an entrepreneur or a building owner needs to secure a loan from a financial institution at the prevailing market rate. The next step involves the financial institution submitting documents to Bangladesh Bank for low-cost refinance.[50]

In addition to these schemes, garment industries could take loans for rooftop solar projects under the Program to Support Safety Retrofits and Environmental Upgrades (SREUP) at a 7% interest rate per annum until 2024.[51,52]

Other small-scale renewable energy projects suitable for rural areas, such as solar irrigation, biogas, biomass to energy, etc., have limited access to loans. IDCOL, supported by MDBs, is the prominent financier of these technologies. Besides, the Bangladesh Rural Electrification Board and the Bangladesh Agricultural Development Corporation promote solar irrigation, mostly under grant support, in areas where access to finance is challenging.

Table 2: Debt Financing in Bangladesh's Small-scale Renewable Energy Projects

Debt Finance Available for Small-scale Projects	Terms and Conditions
Bangladesh Bank's Refinance Schemes[53]: • Refinance Scheme for Environment-friendly Projects (fund limit: Tk10 billion); environment-friendly projects of 70 types are eligible for this scheme. • Green Transformation Fund (GTF) for export-oriented manufacturing industries (fund limit: Tk50 billion)	**Suitable Renewable Energy Projects**: Rooftop solar under the GTF; rooftop solar, solar irrigation, biogas, etc., under the refinance scheme for environment-friendly projects. **Debt-Equity Ratio**: 80:20 under the refinance scheme for environment-friendly projects. 70:30 under the GTF. **Cost of Debt**: Up to 5% per annum **Loan Tenor**: Up to 10 years based on projects
IDCOL's Finance[54] (Funding sources: MDBs like the World Bank, ADB and AIIB and bilateral institutions like JICA and KfW)	**Suitable Renewable Energy Projects**: Rooftop solar, solar irrigation, biogas to electricity, biomass to electricity, etc. **Debt-Equity Ratio**: 80:20 for rooftop solar and biogas to electricity projects. 60:40 for biomass to electricity projects. 35% debt is combined with 50% grant in solar irrigation projects (the debt contribution may rise to 50%). **Cost of Debt**: 6% per annum for rooftop solar, biomass to electricity and solar irrigation projects. 6-9% for biogas to electricity projects.

[50] Bangladesh Bank. Quarterly Review Report on Sustainable Finance. March 2025.
[51] SREUP. Financial Benefits. March 2025.
[52] While the first phase of SREUP ended, a new phase may start.
[53] Refinance Scheme for Islami Banks and Financial Institutions is excluded as it failed to attract borrowers in the last three years.
[54] IDCOL. Renewable Energy – Lending terms. 2025.

	Loan Tenor: 8 to 10 years based on projects.
Other Local Financial Institutions	**Suitable Renewable Energy Projects**: Rooftop solar **Debt-Equity Ratio**: 80:20 (may vary based on the merit of a project) **Cost of Debt**: Market-driven **Loan Tenor**: Normally 5 years
Program to Support Safety Retrofits and Environmental Upgrades in Readymade Garment Sector Project (SREUP) (Tk5 billion, provided by development partners and managed by Bangladesh Bank)[55]	**Suitable Renewable Energy Projects:** Rooftop solar **Debt-Equity Ratio**: 90:10 **Cost of Debt**: 7%

Sources: Bangladesh Bank; IDCOL; SREUP; KII; IEEFA's Analysis.

Equity Finance

Project owners, i.e., households in rooftop solar and landowners in solar irrigation systems, inject equity capital into these projects. Under the Operational Expenditure (OPEX) model, it is the developer who provides equity capital, but there is less uptake of that business model.

Financing Needs in the Renewable Energy Sector until 2040

With solar energy dominating Bangladesh's renewable energy sector, we believe this trend will continue. In different scenarios, utility-scale solar will dominate with 45-55% of new renewable energy capacity additions from July 2025-December 2030. Rooftop solar will be the second-highest contributor during this period, with a share between 25% and 35%. Solar irrigation, wind and waste-to-energy will help meet the rest of the 2030 renewable energy target. However, this study estimates that the share of utility-scale solar in new capacity installation will decrease slightly during 2031-40, with an increase in rooftop solar. The increase in rooftop solar capacity is attributed to Bangladesh's plans for significant investment in industries in its new economic zones, and these industries will likely invest in rooftop solar to harness this cheap energy.

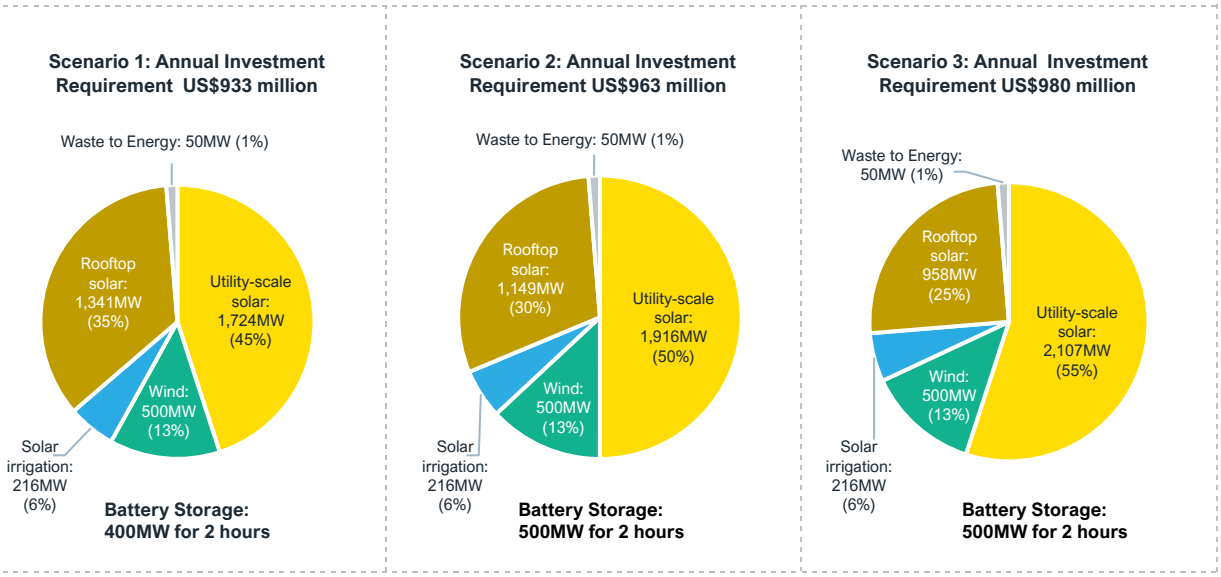
The additional renewable energy capacity addition needs significant investment. This study estimates that Bangladesh will require between US$933 million and US$980 million per annum to reach a combined renewable energy capacity of 5,831MW by 2030. The country would then need to raise annual investment in the subsequent years between US$1.37 and US$1.46 billion to attain a combined renewable energy capacity of 16,506MW by 2040 (see Figure 6 for different scenarios and assumptions; Annexure 4 provides additional details, including the cost of different technologies).

[55] The fund's phase has ended. The government may start a new phase.

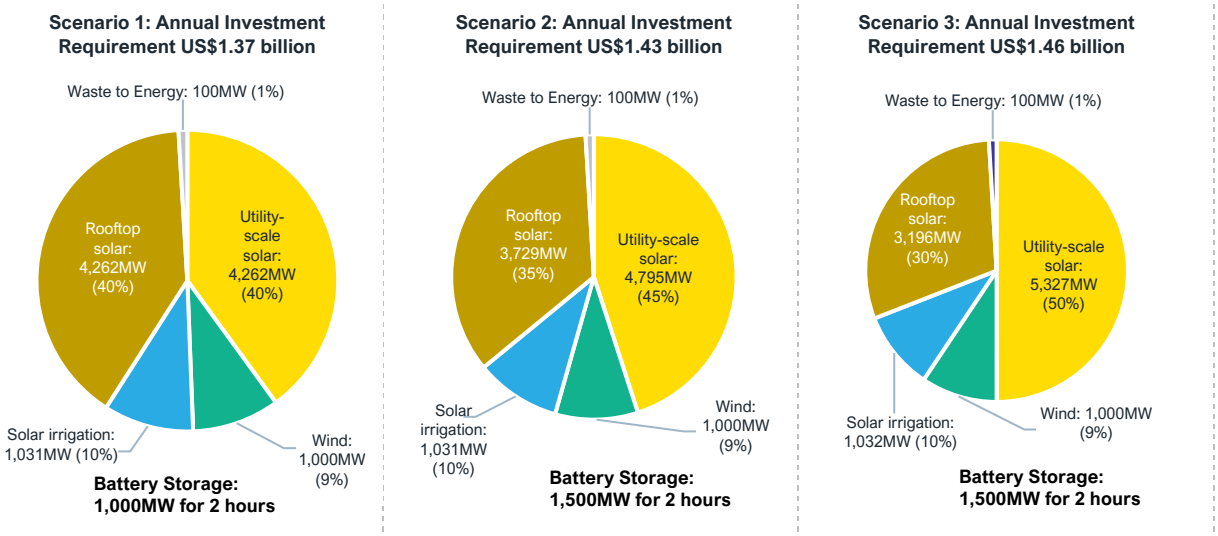
This section further assesses the ballpark needs for debt and equity finance in utility-scale and small-scale projects until 2040.

Figure 6: Investment Requirements to Achieve Renewable Energy Goals

A. Scenario analysis to reach **5,851MW** by 2030 from the present installed capacity of **1,559MW** (utility-scale renewable energy projects of 461MW are under construction)



B. Scenario analysis to reach **16,506MW** by 2040 from the intended **5,851MW** in 2030



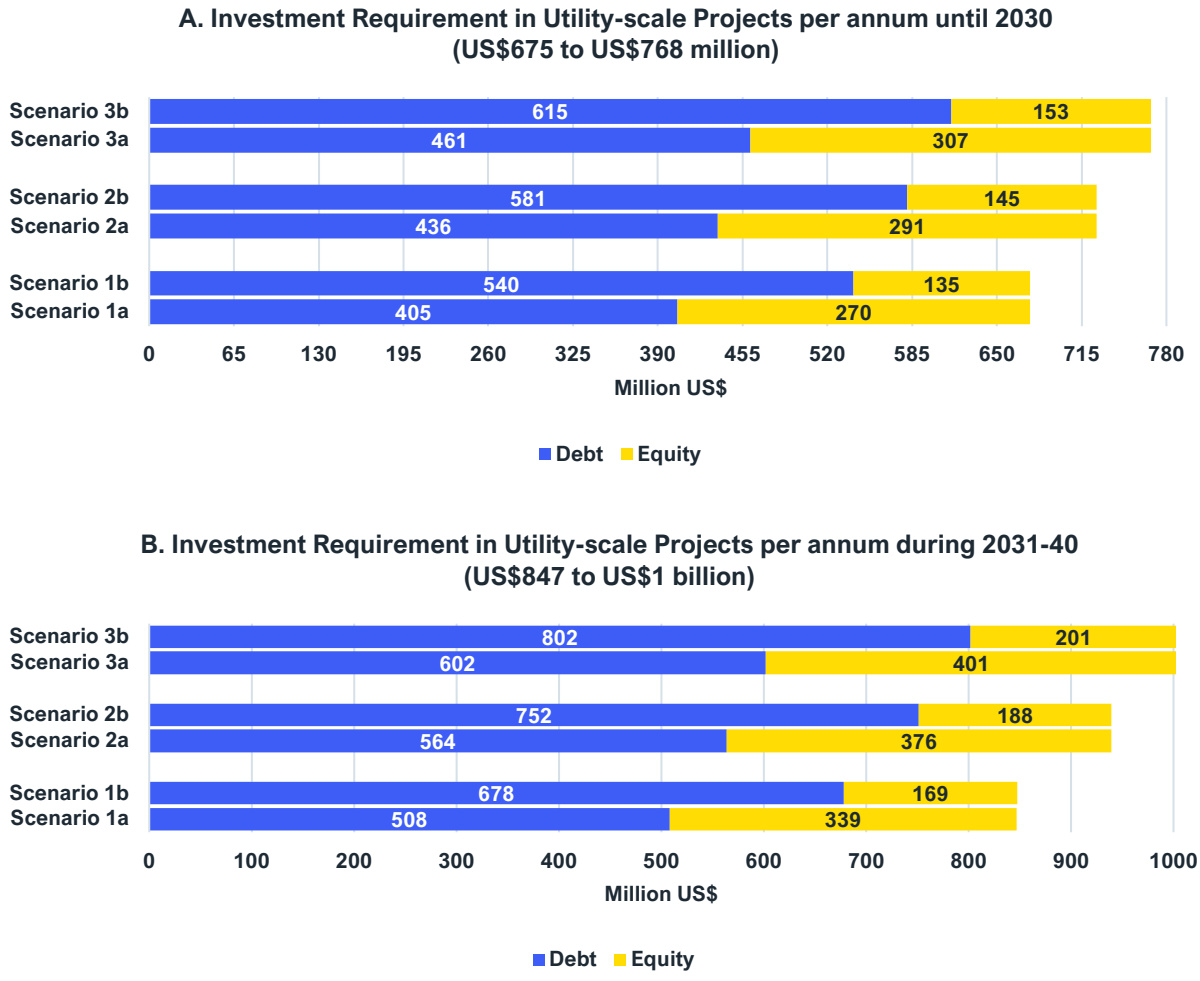
Assumptions: This study considers solar energy – utility-scale solar, rooftop solar and solar irrigation – as the most feasible option. The study has assumed battery backup of two hours for up to 500MW capacity for the 2030 goal; it has further assumed a two-hour battery backup for up to 1,500MW additional capacity for the 2040 goal. Despite the availability of biomass and biogas resources in rural areas, this study has not included them as they have alternative applications; For instance, millers use rice husk in the parboiling process; additionally, villagers use rice straw as feed for cows. While solar home systems provided much-needed access to electricity in off-grid areas before 2022, the expansion of the grid to remote areas means that they will have almost no role in the future. Annexure 4 provides additional details.

Financing Needs in Utility-scale Projects

Based on three different scenarios, Bangladesh will likely require new utility-scale renewable energy capacity between 2,274MW and 2,657MW from July 2025 to December 2030. These utility-scale projects might cost Bangladesh between US$675 and US$768 million per annum. Assuming a debt-equity ratio in the range of 60:40 to 80:20 in Bangladesh, the utility-scale renewable energy segment would need between US$405 and US$615 million per annum in debt finance. The equity finance requirement will likely vary between US$135 and US$307 million per annum (see Figure 7A).

Further, the country might need to add utility-scale renewable projects between 5,362MW and 6,427MW between 2031 and 2040. A ballpark estimate shows that the financing requirement per annum would vary between US$847 million and US$1 billion during 2031-40, with annual debt and equity finance of up to US$802 million and US$401 million, respectively (see Figure 7B).

Figure 7: Investment Requirements in Utility-scale Renewable Energy Projects

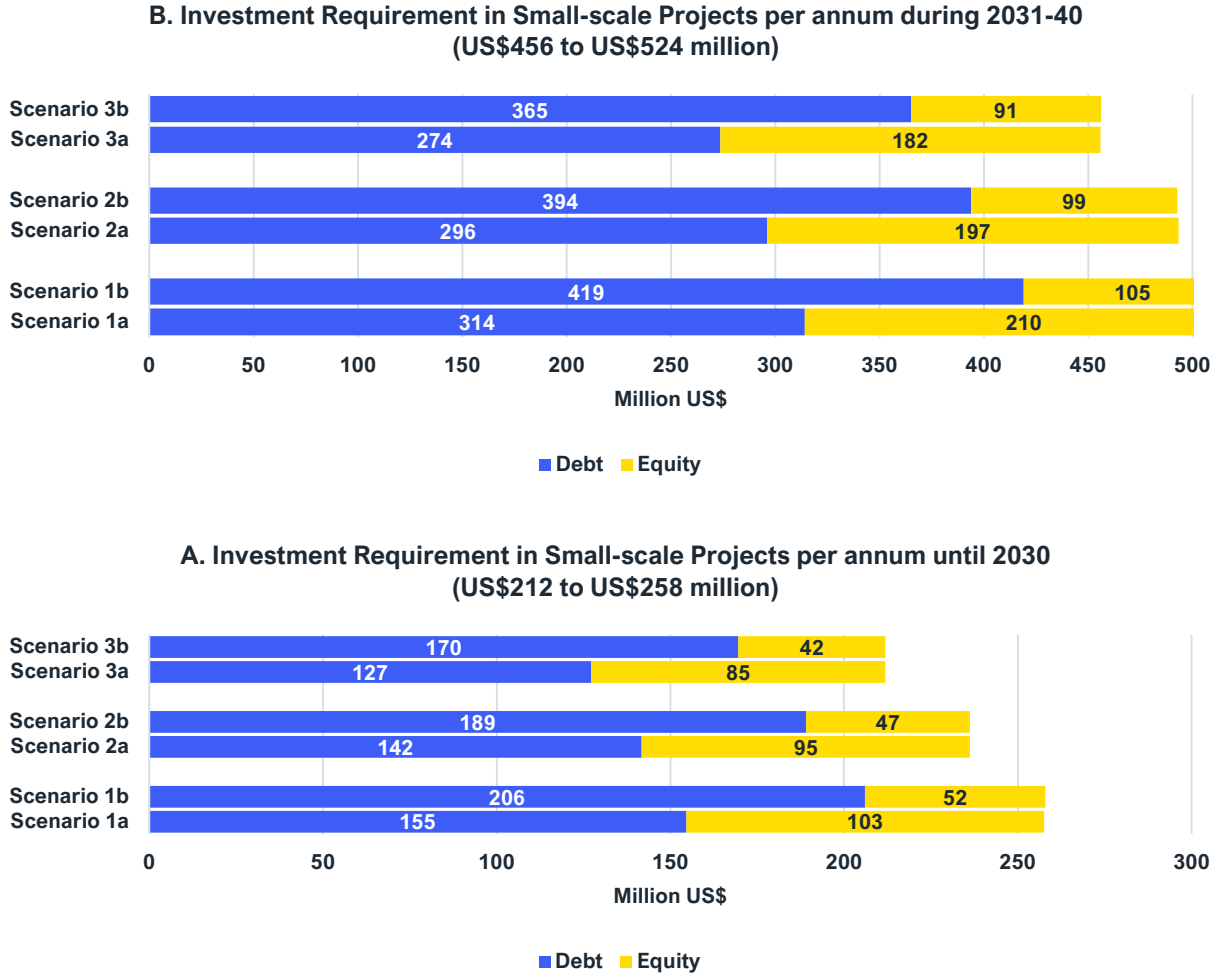


Financing Needs in Small-scale Projects

This study considers rooftop solar and solar irrigation as the most suitable small-scale technologies. Based on different scenarios, the capacity of new small-scale renewable energy projects will increase between 1,174MW and 1,557MW from July 2025 to December 2030, requiring between US$212 million and US$258 million annually. The requirement for debt and equity finance will range from US$127 to US$206 million per annum and US$42 to US$103 million per annum, respectively (see Figure 8A).

Bangladesh will further require new small-scale renewable energy projects between 4,228MW and 5,293MW capacity during 2031-40. The estimated annual financing needs will vary between US$456 million and US$524 million. The debt and equity requirements will range from US$274 million to US$419 million per annum and US$91 million to US$210 million per annum, respectively (see Figure 8B).

Figure 8: Investment Requirements in Small-scale Renewable Energy Projects



Challenges in Mobilising Renewable Energy Finance

The cumulative renewable energy investment in Bangladesh was reportedly a meagre US$1.43 billion during 2018-23.[56] This means the average annual renewable energy investment in the country was approximately US$238 million over the above-mentioned period. With Bangladesh requiring investment of up to US$980 million per annum until 2030 and US$1.46 billion post-2030 to achieve 30% combined renewable capacity by 2040, the prevailing trend is likely to result in a huge gap in the flow of finance. While renewable energy projects require long-term capital, the absence of a supportive regulatory environment poses challenges to mobilising capital. Besides, institutional, technical and structural barriers adversely affect the flow of finance to Bangladesh's renewable energy sector.

This section highlights the challenges to mobilising finance for utility-scale and small-scale projects.

Hurdles for Utility-scale Projects

Policy and Contractual Risks

While Bangladesh used to follow a non-competitive renewable energy procurement process until 18 August 2024 – allowing private project developers to submit unsolicited proposals and then sign contracts based on negotiations – the current government has changed the process. [57] It suspended the Quick Enhancement of Electricity and Energy Supply Act, putting an end to unsolicited project proposals.[58,59] Subsequently, the government suspended 31 utility-scale renewable energy projects that received Letters of Intent (LOIs) through the non-competitive process.[60] This abrupt policy shift and the resulting contractual uncertainties have shaken investor confidence in the renewable energy sector.

Sovereign Risks

Bangladesh's lower sovereign credit ratings deter foreign investors like many other emerging and developing economies (EMDEs). Bangladesh's sovereign rating of B1 before November 2024 (by Moody) - two notches below investment grade, appeared to be a deterrent to attracting foreign capital at a lower cost. Further, Moody's downgraded Bangladesh's credit rating to B2 in November 2024, based on the country's lower-than-expected economic growth in the near term, political challenges and banking sector risks.[61] This will deteriorate the country's credit profile in the

[56] BloombergNEF. Climate Scope – Bangladesh. November 2024.
[57] The Daily Star. Renewable Ambitions Still Mired in Uncertainty. 9 March 2025.
[58] IEEFA. How to Make Bangladesh's Power Sector Sustainable. 29 August 2024.
[59] New Age. All Activities under Quick Enhancement of Electricity and Energy Supply Act Suspended. 18 August 2024.
[60] The Business Standard. Should Govt Suspend Renewable Energy Projects or Renegotiate Tariffs to Speed up Green Goals? 26 October 2024.
[61] New Age. Moody's Cuts Bangladesh's Credit Ratings Further. 18 November 2024.

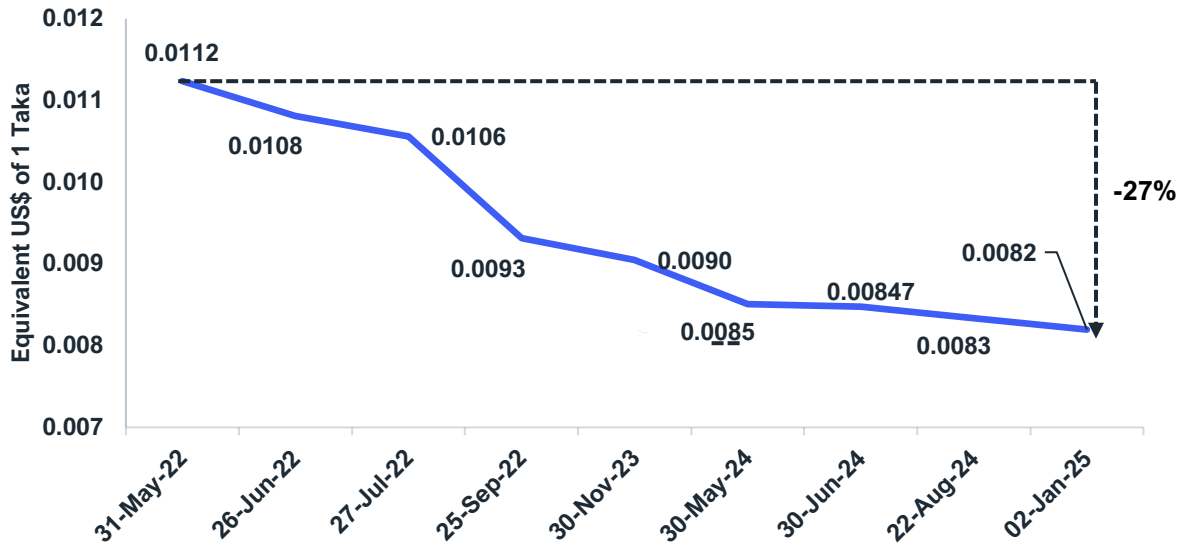
international financial market, making borrowing expensive and discouraging borrowers seeking debt for renewable energy projects.

Currency Risks

Given the volume of capital required for the renewable energy sector, Bangladesh must mobilise foreign capital to fund renewable energy projects. Like many other EMDEs, currency risk is a significant barrier to mobilising foreign capital. A sharp depreciation of Bangladeshi Taka against foreign currency (e.g.US$) can deter foreign investors from taking up projects in Bangladesh. Besides, borrowers who raise capital in foreign currency will find it difficult to service foreign-denominated debt if the domestic currency depreciates sharply, since renewable energy projects generate cash flows in local currency. Although currency swaps are available to address such risks, the cost of currency swaps is high for borrowers, which effectively increases the cost of debt capital.

Notably, the Bangladeshi Taka depreciated by 27% between 31 May 2022 and 2 January 2025 (see Figure 9).[62]

Figure 9: Trend of Bangladesh's Currency Depreciation



Sources: Bangladesh Bank; IEEFA's Analysis.

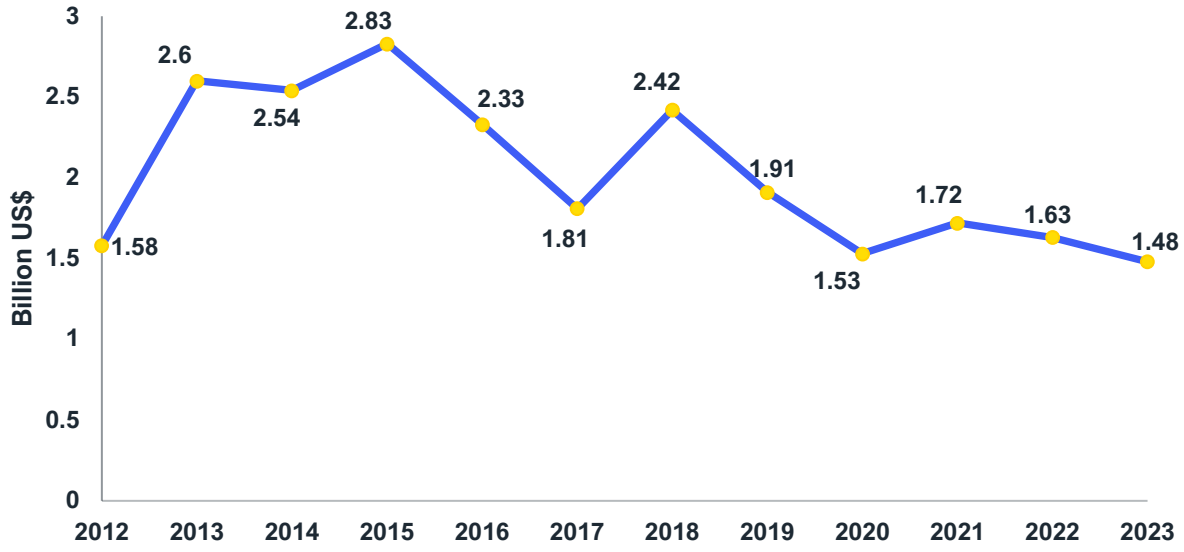
Declining Foreign Investment

While FDI can help Bangladesh mobilise capital, current FDI trends paint an unfavourable picture. A brief year-on-year assessment shows that the country's overall FDI peaked at US$2.83 billion in 2015

[62] Ibid.

and fell to US$1.48 billion in 2023 (see Figure 10).[63] Despite the government's efforts to establish good governance, altering the FDI trajectory will take time. This may impact FDI flow in the renewable energy sector.

Figure 10: FDI Trend in Bangladesh



Source: The World Bank.

Off-taker's Risks

BPDB, the sole buyer of electricity in the country, is under financial stress, leading to counterparty risk, i.e., delay and default in payment to renewable energy power producers. Such risks may deter investment in utility-scale renewable power projects.

BPDB received a subsidy of Tk382.9 billion (US$3.14 billion) in FY2023-24 to cover its revenue shortfall due to the difference between power generation cost and selling price.[64] As the subsidy burden may reportedly soar by 55% year-on-year in FY2024-25, investors might exercise caution in taking up new utility-scale projects in Bangladesh.[65]

Following the suspension of the Quick Enhancement of Electricity and Energy Supply Act in August 2024, the government has begun inviting tenders for utility-scale renewable energy projects, removing the implementation agreement clause, similar to a sovereign guarantee. Project developers are not keen to participate in the tenders as they might face hurdles in raising debt finance in the absence of an implementation agreement. A Power Purchase Agreement (PPA) stipulates the terms

[63] The World Bank. Foreign Direct Investment, Net Inflows (Balance of Payments, Current US$) – Bangladesh. 28 January 2025.
[64] BPDB. Annual Report 2023-24. 15 October 2024.
[65] The Daily Star. Revised Budget for FY25: Power, Fertiliser Subsidies to Balloon. 16 March 2025.

and conditions of renewable energy procurement, but an implementation agreement provides payment assurance.

Land Acquisition Challenges

Land acquisition is a major hurdle to developing new utility-scale renewable projects in densely populated and agriculture-dependent Bangladesh. As purchasing land is a costly venture and ownership is fragmented, developers struggle to acquire land and obtain loans for project implementation.

Capex-heavy Projects with a Long Payback Period

Utility-scale renewable energy projects, being capex-heavy, require a longer maturity period of around 20 years to recover initial capital and generate returns for equity investors and lenders. As a result, these projects need loans for a longer period, which does not match with commercial banks' shorter lending tenure. Moreover, increased exposure to long-term loans creates an asset-liability mismatch for commercial banks, which is discouraged by central banks.

Locally Available Low-Cost Financing Avenue is Limited

While IDCOL provides low-cost loans for local utility-scale renewable energy projects, it cannot meet the sector's financing needs.

Capital Market is not Well-developed

Long-term institutional investors, such as pension funds and insurance companies, are appropriate to meet the financing needs of utility-scale renewable energy projects through bonds and equities. However, Bangladesh's underdeveloped capital market limits its ability to channel long-term capital from these institutional investors. Although financial institutions participated in a green sukuk to raise debt finance for the country's largest solar project, the tenor was only five years.

Hurdles for Small-scale Projects

Technology and Performance Risks

Small-scale systems face performance risks. The country lacks a well-developed supply chain, resulting in inadequate maintenance of small-scale renewable energy systems. In addition, the erratic monsoons make renewable energy generation highly unpredictable. All these risks lead to apprehension over the quantum of electricity generation over a long period.

High Import Duties

The government has imposed high import duties on small-scale renewable energy system components, such as rooftop solar and solar irrigation, whereas utility-scale projects are exempt. [66,67] This, in turn, raises project costs, affecting the implementation of rooftop solar and solar irrigation systems. While the strategy to safeguard local manufacturers tempted the Bangladesh government to take this step, it has backfired. The country still imports solar components as a few companies that assemble solar panels are unable to meet domestic demand.[68] Although high import duties might help the government raise revenue, they impede the scale-up of small-scale renewable energy projects.

Requirement of Significant Collateral

State-owned financial institution IDCOL requires a 100% bank guarantee to disburse loans for rooftop solar projects. Other financial institutions normally ask for land as collateral to fully secure their loans, reducing building owners' motivation for rooftop solar projects. EPC companies that may help expand rooftop solar projects under the OPEX model face similar challenges in obtaining loans as their balance sheets often do not meet the lending criteria of banks and financial institutions.

Complex Green Refinance Schemes

Although green refinance schemes are attractive and can speed up rooftop solar and small renewable energy projects, their utilisation remains low.[69] Further analysis shows that renewable energy projects received less than 10% of green funds during 2018-24.[70] Financial institutions, EPC companies and entrepreneurs face several challenges in accessing green refinance schemes, including asymmetric information and a cumbersome loan disbursement process.

As many borrowers have limited information on different green refinance schemes' interest rates and terms, they do not apply for loans under these schemes. The requirement for many documents and a lengthy disbursement process also discourages entrepreneurs. The disbursement of low-cost refinance is a two-step process – first, entrepreneurs submit loan proposals to financial institutions, which disburse loans at the prevailing market rate. Financial institutions apply to Bangladesh Bank for refinance as the next step. If the application documents do not satisfy the Central Bank, entrepreneurs will bear the high cost of commercial loans. Moreover, financial institutions often consider small-scale projects risky; they frequently reject applications and make loan disbursement

[66] IEEFA. Towards a Rooftop Solar Transition in Bangladesh. 18 December 2023.
[67] KII.
[68] The National Bureau of Asian Research (NBR). Building Renewable Energy in Bangladesh. 6 March 2023.
[69] IEEFA's analysis based on the quarterly review reports on sustainable finance of banks and finance companies available on Bangladesh Bank's website.
[70] Ibid.

conditions stringent for borrowers. Besides, not all financial institutions have sufficient capacity to assess loan proposals for different renewable energy technologies.

Recommendations

As utility-scale and small-scale projects face different challenges, this section recommends different sets of measures for them.

Utility-scale Projects

Policy Certainty

The abrupt transition to competitive bidding and the suspension of renewable energy projects with LOIs has triggered investor concerns. Project developers incurred heavy costs in completing the process from proposal submission to LOI issuance and acquiring land. The government must keep policies consistent and ensure that new policy does not cost project developers dearly. Such measures will help build investor confidence.

Payment Certainty

Payment Security Mechanism

While BPDB signs long-term PPAs with renewable energy producers, there are apprehensions over changing policy and regulations. Given BPDB's weak financial health, renewable energy project developers may contemplate the possibility of delay or default in payment in their investment decisions. As the government has removed the 'implementation agreement' clause, which provides a sovereign guarantee to renewable energy producers, project developers might struggle to raise debt finance.[71]

The Bangladesh government can consider reinstating the implementation agreement clause. Alternatively, like the Solar Energy Corporation of India, it can set up a funding mechanism to provide revenue assurance to renewable energy producers, mitigating counterparty risks. This will ensure timely payment to solar energy producers in the event of delays, changes in regulatory/ policy/ legal/ evacuation/ open access requirements not foreseen at the time of project approval.[72] MDBs and bilateral financial institutions can help set up this payment security mechanism. The government's participation as a guarantor can ensure payment from BPDB.

[71] KII.
[72] CEEW Green Finance Centre. How Payment Security Mechanism Works.

Partial Risk Guarantee

A credit enhancement mechanism, such as partial credit guarantee, is an efficient way of leveraging public capital to crowd in private capital. With support from MDBs and bilateral agencies, the government can establish this facility to partially cover payment risks, ensuring risk-adjusted returns to private investors. This can attract private investors to Bangladesh's renewable energy sector.

Addressing Currency Risks

A hedging facility for the renewable energy sector can subsidise currency swaps for foreign loans or partially compensate foreign exchange losses incurred by borrowers. The Bangladesh government can create such a facility by partnering with MDBs and bilateral financial institutions. There are instances where foreign exchange facilities (e.g. The Currency Exchange Fund), funded by governments, support foreign capital borrowers in frontier markets. Protecting against the drastic devaluation of local currency and subsidising currency swaps can support renewable energy developers to borrow foreign capital at a reasonable cost.

Addressing Barriers to Acquiring Land

Land Resource Mapping

The challenges of acquiring land for utility-scale renewable energy projects highlight the need for land resource mapping. Suitable land identified through mapping can help the Bangladesh government earmark areas for renewable energy projects. This will avoid land acquisition delays and expedite project implementation.

Public-Private-Partnership

Public-Private-Partnerships (PPPs) can play a key role in mobilising private capital for renewable energy projects that face policy and administrative challenges. The government can help with land acquisition, energy transmission, and signing PPAs, encouraging the private sector to raise capital and develop the project. The government can offer a minimum guarantee to private companies against their investment in renewable energy projects.

This PPP model would suit private sector participation in renewable energy projects in special economic zones designed for the country's industrialisation. As the government has already allocated land for special economic zones, it can allow private project developers to implement and operate renewable energy projects in designated areas, avoiding land acquisition delays. The

Bangladesh government can utilise its PPP fund, which has a base of Tk50.4 billion (US$413 million), to acquire land for private sector renewable energy projects.[73,74]

Small-scale Projects

The accelerated deployment of small-scale renewable energy projects will depend on addressing the high import duty on critical components, performance issues and perceived risks. Further, easing lending norms for green funds can also help scale up such projects.

Import Duty Waiver or Reduction

Waiving import duty on components for small-scale projects will create a level playing field with utility-scale projects, which are exempted from such payments. The waiver will motivate building owners to invest in rooftop solar. The accelerated deployment of rooftop solar systems will help BPDB reduce the purchase of expensive oil-fired power (average cost of Tk26.4/kWh in FY2023-24), which industries, commercial buildings and other establishments use during the daytime. This waiver can indirectly help the country curb the power sector's subsidy burden and the country's fossil fuel imports.

To make small-scale solar projects affordable, the government has decided to reduce the customs duty on imported solar inverters from 10% to 1%.[75] Likewise, it can consider waiving the import duty on other small-scale solar project components, such as solar panels, Fibre Reinforced Polymer walkway, mounting structure and direct current (DC) cable.

Capacity Development of Service Providers and Bankers

Proper maintenance is essential to ensure the optimal performance of renewable energy systems. This requires well-trained personnel. The Sustainable and Renewable Energy Development Authority (SREDA), Bangladesh's nodal agency to accelerate clean energy, should conduct certification courses for maintenance professionals of renewable energy service providers. The renewable energy sector's association, namely, the Bangladesh Solar and Renewable Energy Association (BSREA), can also arrange technical training for service providers on installing and maintaining small-scale renewable energy projects. Better performance of small-scale renewable systems will encourage banks, financial institutions and building owners to invest in such projects.

SREDA can collaborate with IDCOL to design and implement capacity development programmes for financial institutions, focusing on the appraisal of renewable energy projects. Banks and non-bank

[73] Ministry of Finance. National Budget Speech 2025-26. 2 June 2025.
[74] The government has increased the fund size from 35 billion.
[75] The Business Standard. NBR Slashes Customs Duty for Petroleum, Solar Power Generation. 22 June 2025.

financial institutions require staff equipped with the necessary knowledge and skillset to assess small-scale projects and address the perception risks associated with them.

Raising Awareness of Stakeholders

As green refinance schemes underwent a series of changes, such as funding base, cost of borrowing, loan tenure, etc., an information gap persists among stakeholders. Given that the utilisation of green refinance schemes is low, SREDA, Bangladesh Bank and BSREA can jointly organise events to raise awareness on these schemes.

Designing a Credit Risk-Guarantee Scheme

Financial institutions are often reluctant to provide loans for rooftop solar projects due to real and perceived risks. They often ask borrowers for collateral, which is more than the loan's value.[76] This discourages borrowers from raising debt capital for rooftop solar, consequently affecting the desired flow of finance, even if the project is commercially viable.

Moreover, financial institutions hesitate to provide loans to rural borrowers interested in implementing solar irrigation, biogas and biomass for electricity projects due to their lack of credit history. Further, financial institutions consider this group of borrowers highly risky due to their inability to provide collateral and the lack of a stable income.

A credit risk guarantee scheme can address these challenges and encourage financial institutions to provide loans for small-scale renewable energy projects. Notably, Bangladesh Bank has a portfolio guarantee scheme to help Cottage, Micro and Small Enterprises to support borrowers without sufficient collateral to access credit from financial institutions.[77]

Bangladesh Bank can design a similar scheme and extend a portfolio guarantee to financial institutions providing loans for small-scale renewable energy projects. Alternatively, MDBs can provide financial and technical support, and develop a similar scheme exclusively for small-scale renewable energy projects.

Allowing Pre-finance instead of Refinance

The lengthy and cumbersome disbursement process prevents borrowers from accessing Bangladesh Bank’s low-cost refinance schemes suitable for small-scale renewable energy projects.

[76] Based on KII
[77] Bangladesh Bank. Manual of Credit Guarantee Scheme [For Cottage, Micro and Small Enterprises (CMSE)]. 31 January 2021.

A pre-finance modality will likely minimise delays and simplify the loan disbursement process. The SREUP fund of Bangladesh Bank, supported by international development agencies, is an example of how the pre-finance model can streamline disbursement.

Building on this experience, Bangladesh Bank can change the modality of its green refinance schemes to pre-finance. Financial institutions and Bangladesh Bank can jointly assess loan proposals for green projects at the loan origination stage. This will reduce the time it takes for commercial banks to access low-cost finance from the central bank and ensure that borrowers receive affordable financing at the origination stage if the loan is approved.

Dedicated Renewable Energy Finance Scheme

Energy efficiency, effluent treatment plants and green buildings receive most of the disbursed green funds, while renewable energy receives less than 10%.[78] As renewable energy capacity addition is critical for the country's energy security, the government can create a dedicated low-cost financing scheme for small-scale renewable energy projects, ensuring a significant portion of green capital flows into small-scale renewable energy projects.

Making Green Refinance Schemes Accessible to Micro Finance Institutions

Renewable energy projects face roadblocks in rural areas as financial institutions find borrowers in these areas risky. Micro Finance Institutions (MFIs) charge rural borrowers a high rate of interest due to the lack of collateral and high perceived risk. Additionally, most financial institutions do not have enough capacity to monitor rural borrowers. If the central bank allows MFIs to access its refinance scheme for green products like financial institutions, renewable energy projects will likely receive loans at low rates. This can help accelerate rooftop solar, solar irrigation and biogas projects in rural areas.

Additionally, Bangladesh Bank can offer a portfolio guarantee to MFIs. For instance, MFIs with access to MDB funds can provide loans for small-scale renewable energy projects in rural areas supported by the bank's portfolio guarantee scheme. This will reduce the interest rate and act as an incentive for rural entrepreneurs.

Sustainability-linked Loan

In a first-of-its-kind case in Bangladesh, HSBC Bank provided a sustainability-linked loan (SLL) to a textile company in 2020, linking the interest rate to the reduction of carbon emissions. If the borrower could achieve the goal, the bank would reduce the loan's interest rate by a certain percentage.[79] A

[78] IEEFA's analysis based on Bangladesh Bank's quarterly reports on sustainable finance.
[79] The Daily Star. HSBC Lends Square Tk 1,000cr in Bangladesh's First Sustainability-linked loan. 24 June 2020.

similar approach could help the garment industry quickly tap into the benefits of rooftop solar, contributing to its greenhouse gas emission reduction target of 30% by 2030.[80] With increasing global regulations on sustainability, Bangladesh's garment industry needs to improve its sustainability performance, including environmental, social, and governance (ESG) parameters. SLLs can help garment industries utilise rooftop solar systems and comply with ESG requirements.

Conclusion

The high subsidy burden – partially attributed to costly imported energy – has strained Bangladesh's power sector. However, the country is yet to see a significant contribution of renewable energy to its power system, despite it being a cleaner and more affordable alternative. Scaling up renewables will help Bangladesh reduce energy costs, enhance energy security, and improve the government's fiscal position.

Our estimates suggest that Bangladesh will require between US$933 million and US$980 million per annum to reach its 2030 renewable energy target. Post-2030, the country will need to raise annual investment between US$1.37 billion and US$1.46 billion to attain its 2040 target. This means the country should ramp up the prevailing investment trend of US$238 million annually, 4.1x to 6.1x times in the next five to 15 years, for which mobilising public, private and international capital at scale is key. However, the renewable energy sector faces several challenges, including policy and contractual risks, sovereign and currency risks, off-taker's risks, land acquisition challenges. The unavailability of low-cost and long-term financing compounds the problem. Besides, the small-scale distributed renewable energy sector faces additional challenges, such as technology and performance risks, high import duties, requirement of substantial collateral for loans, and complex green refinance schemes.

The Bangladesh government should design a regulatory environment that ensures policy certainty, incentivises investments and reduces risks in the renewable energy sector. In doing so, the government should collaborate with local and global institutions to frontload measures to mitigate risks and eliminate barriers. Decisive action at this stage can secure a resilient and economically sustainable future for Bangladesh.

[80] Fibre2Fashion. BGMEA Joins Fashion Industry Charter for Climate Action. 20 July 2019.

Annexure 1: KII Information

Total respondents: 18

Types of respondents: Bankers, sector experts, government representatives, professionals from international development agencies and project developers

Key information collected:

- Challenges in financing renewable energy projects in Bangladesh and ways to address them
- Complexities in low-cost green refinance schemes suitable for renewable energy projects and how to fix them
- Rationale for import duty waiver for small-scale renewable energy projects
- Most suitable financing sources that could help expand renewable energy in the country
- Potential role of the Bangladesh government's Private-Public-Partnership Fund
- Risk mitigation instruments for utility-scale and small-scale renewable energy projects

Annexure 2: Sample Calculations of Power Purchase Cost from Oil-fired Plants in FY2023-24

Selected Oil-fired Plants[81]

Plant Type – Independent Power Producer (IPP)				
Sample	**Fuel**	**Total Cost (Tk)**	**Total Energy Generated (kWh)**	**Average Cost (Tk/kWh)**
1	Furnace Oil (FO)	845,439,311	31,609,244	26.75
2	Dual Fuel (Gas/FO)	1,409,739,525	54,836,673	25.71
3	FO	2,645,365,575	62,737,128	42.17
4	FO	6,394,148,977	257,944,128	24.79

Plant Type – Rental				
Sample	**Fuel**	**Total Cost (Tk)**	**Total Energy Generated (kWh)**	**Average Cost (Tk/kWh)**
1	FO	2,510,717,107	115,592,152	21.72
2	FO	2,434,215,271	117,680,520	20.68

Plant Type – Public (excluding BPDB's plants)				
Sample	**Fuel**	**Total Cost (Tk)**	**Total Energy Generated (kWh)**	**Average Cost (Tk/kWh)**
1	FO	2,893,436,726	76,055,472	38.04

Selected Renewable Energy Plants

Plant Type – Independent Power Producer (IPP)				
Sample	**Fuel**	**Total Cost (Tk)**	**Total Energy Generated (kWh)**	**Average Cost (Tk/kWh)**
1	Solar	82,226,611	3,893,767	21.12[82]
2	Solar	1,052,853,086	59,149,472	17.8
3	Solar	140,508,224	9,484,831	14.81
4	Wind	462,373,641	33,568,891	13.77

[81] BPDB. Annual Report 2023-24. 15 October 2024.

[82] It was the first utility-scale solar project implemented in Bangladesh and the contract price in US$ was higher than the recent projects. Due to the devaluation of local currency against US$, the average cost of this plant in FY2023-24 was very high. However, the cost of solar energy is gradually decreasing in the country.

Annexure 3: Calculation of Annual Renewable Energy Expansion Rate

Formula used:

Compound Annual Growth Rate (CAGR) = $[(\text{Ending Value} / \text{Beginning Value})^{1/n} - 1]$ [83]

Where **n** is the number of compounding periods

Growth Rate for 2030 Renewable Energy Target:

Installed renewable energy capacity = 1,559MW

Renewable energy capacity under construction = 461MW (approximately)[84]

2030 target = 5,851MW (20% of the maximum demand in 2030 projected in the IEPMP 2023)

Here, the beginning value is = 1,559MW + 461MW = 2,020MW

and **n** is = 5.5 (taking 6 months of 2025 from July)

Required growth rate between July 2025 and December 2030

= $[(5{,}851\text{MW} / 2{,}020\text{MW})^{1/5.5} - 1]$ = **21.3%**

Growth Rate for 2040 Renewable Energy Target:

2040 target = 16,506MW (30% of the maximum demand in 2040, based on the IEPMP 2023's projection)

Here, the beginning value is = 5,851MW

and n is = 10

Required growth rate between January 2031 and December 2040

= $[(16{,}506\text{MW} / 5{,}851\text{MW})^{1/10} - 1]$ = **10.9%**

[83] Corporate Finance Institute. What Is CAGR. 2025.
[84] BPDB. Draft Information on Advancement of the Power Sector. March 2025.

Annexure 4: Calculation of Investment Requirements

Assumptions for the cost of different renewable energy technologies[85]:
Utility-scale Solar = US$1.2 million/MW
Rooftop Solar = US$0.7 million/MW
Wind = US$2 million/MW
Solar Irrigation = US$2.05 million/MW
Battery Storage = US$350/kWh
Waste to Energy = US$8 million/MW

Present installed capacity of renewable energy = 1,559MW[86]
Utility-scale renewable energy projects under construction = 461MW[87]

Expected renewable energy capacity addition between July 2025 and December 2030 = 5,851MW – 1,559MW – 461 MW = 3,831MW (as per the Renewable Energy Policy 2025 and based on the IEPMP 2023's demand projection)

Investment requirement from July 2025 to December 2030:

Scenario	Utility-scale Solar	Rooftop Solar	Wind	Solar Irrigation	Waste to Energy	Battery Storage (within the existing system capacity)	Total Investment Requirement during July 2025-December 2030	Investment Requirement per annum
1	1,724MW	1,341MW	500MW	216MW	50MW	2-hour backup for 400MW	US$5.13 billion	US$933 million
2	1,916MW	1,149MW	500MW	216MW	50MW	2-hour backup for 500MW	US$5.3 billion	US$963 million
3	2,107MW	958MW	500MW	216MW	50MW	2-hour backup for 500MW	US$5.39 billion	US$980 million
Assumptions	Scenario 1: Contributions of utility-scale solar and rooftop solar are 45% and 35% respectively;							
	Scenario 2: Contributions of utility-scale solar and rooftop solar are 50% and 30%, respectively;							
	Scenario 3: Contributions of utility-scale solar and rooftop solar are 55% and 25%, respectively;							
	Wind, solar irrigation and waste to energy capacities are kept constant.							

Expected renewable energy capacity addition between January 2031 and December 2040 = 16,506MW - 5,851MW = 10,655MW (as per the Renewable Energy Policy 2025 and IEPMP 2023's demand projection)

Investment requirement from January 2031 to December 2040:

[85] Based on KII and reference projects.
[86] SREDA. National Database of Renewable Energy. April 2025.
[87] BPDB. Draft Information on Advancement of the Power Sector. March 2025.

Scenario	Utility-scale Solar	Rooftop Solar	Wind	Solar Irrigation	Waste to Energy	Battery Storage (within the existing system capacity)	Total Investment Requirement during January 2031-December 2040	Investment Requirement per annum
1	4,262MW	4,262MW	1,000MW	1,031MW	100MW	2-hour backup for 1,000MW	US$13.71 billion	US$1.37 billion
2	4,795MW	3,729MW	1,000MW	1,031MW	100MW	2-hour backup for 1,500MW	US$14.33 billion	US$1.43 billion
3	5,327MW	3,196MW	1,000MW	1,032MW	100MW	2-hour backup for 1,500MW	US$14.6 billion	US$1.46 billion
Assumptions		Scenario 1: Contributions of utility-scale solar and rooftop solar are 40% each;						
		Scenario 2: Contributions of utility-scale solar and rooftop solar are 45% and 35%, respectively;						
		Scenario 3: Contributions of utility-scale solar and rooftop solar are 50% and 30%, respectively.						
		Wind, solar irrigation and waste-to-energy capacities are constant.						

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The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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