



Policy Brief

RENEWABLE ENERGY FINANCE – A CRITICAL ANALYSIS



Overview

The global energy crisis and the impact of climate change require a shift towards renewable and sustainable energy sources. Bangladesh is vulnerable to the impacts of climate change and needs to mitigate its effect by reducing fossil fuel reliance and developing renewable energy sources. Currently, only 3.75% of Bangladesh's total electricity generation capacity is from renewable sources (as per SREDA), falling short of the policy target of 10% of energy sourced from renewable sources by 2020. According to the NDC, updated in 2021, Bangladesh will face significant losses in its GDP and displacement of people due to climate change. The country needs climate finance to mitigate it and develop renewable energy. The IPCC reported that Bangladesh will face significant losses in its GDP and displacement of people due to climate change.

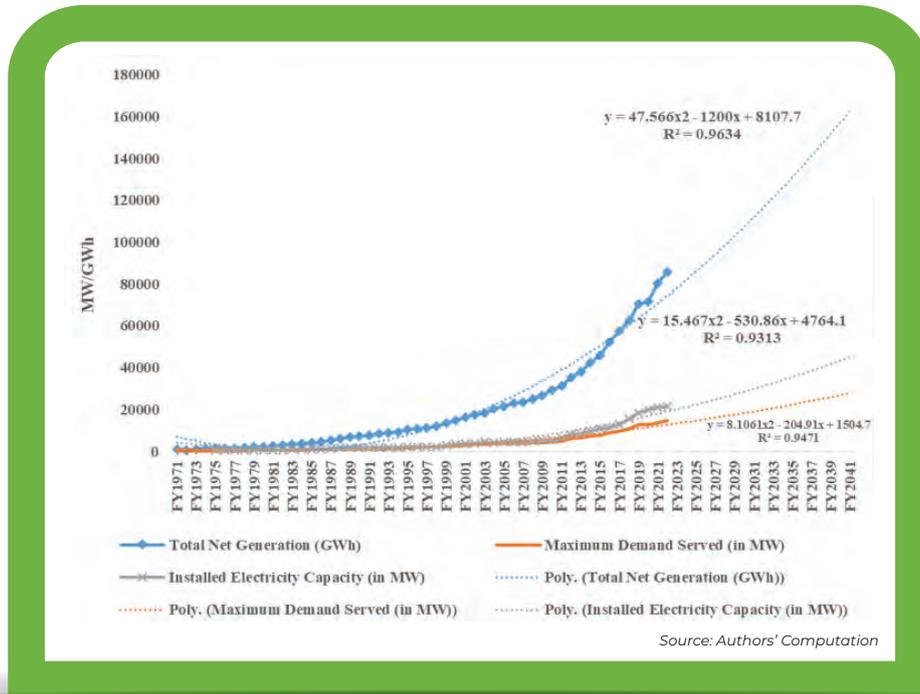
The energy crisis triggered by the Ukraine-Russia conflict and economic slowdown due to the COVID-19 pandemic has brought the concern of energy security to the forefront. BPDB is not in a position to mobilize foreign currency for importing any fossil-fuels for power generation. Fossil-fuel based power generation and consumption have posed the BPDB into huge financial risks due to growing losses, it was around 1439.06 Crore BDT in FY2021-22 (BPDB report, 2021-22, page, 98). Idle power plants elicited an increase of USD 270.80 million in a year between fiscal years 2018-19 and 2019-20 (Mehedi & Ali, 2022). Capacity charges paid by BPDB have been a huge financial burden and it is getting worse every year (Hossain, 2022). If even a portion of the capacity charge that is given to inactive power plants were diverted to renewable energy creation, it could contribute significantly to the cause.

A 2018 paper analyzes how much welfare is gained or lost by subsidizing fossil fuel; it is found that complete removal of fossil fuel subsidy would increase household welfare by 1.89%. The paper argues that these subsidies benefitting fossil fuels act as a hindrance to the development of the renewable energy market (Amin, Marsiliani, & Renstrom, 2018).

Estimated Demand for Electricity by 2050 and Contribution of RE

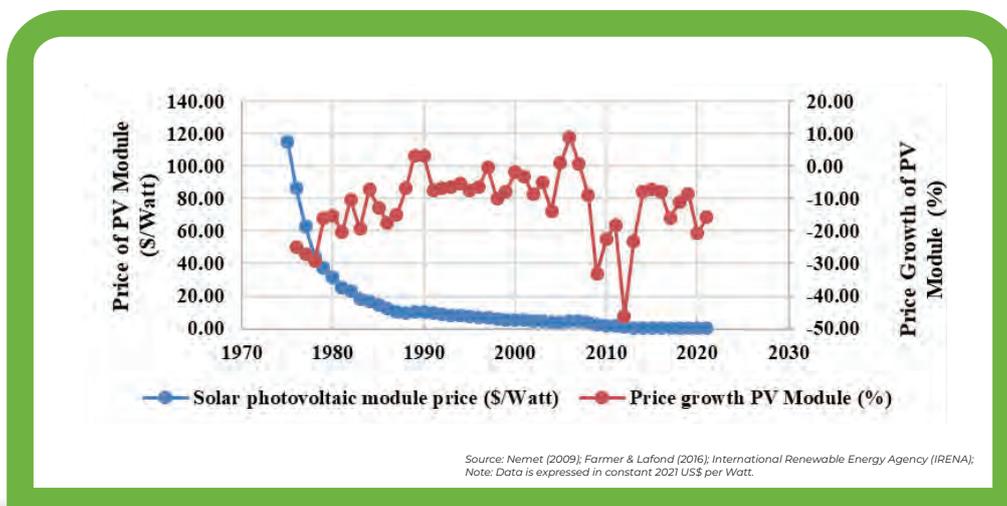
Trend analyses were conducted utilizing data on net power generation in Bangladesh from FY1971 to FY2022. According to the non-linear trend study, Bangladesh's estimated need for net energy generation by 2041 might reach 160,000 GWh. It is anticipated that Bangladesh would need roughly 45,000 MW of installed capacity for energy generation to meet the country's anticipated electricity consumption (after adjusting for capacity deration). It suggests that in order for Bangladesh to fulfill its pledge at COP26 to produce 40% of its power from renewable sources by 2041 (H. E. Hasina, 2021), it will need to create roughly 18,000 MW of installed capacity (SREDA, 2020).

Figure 1: Predicted Net Electricity Generation Demand/Installed Capacity Requirement in Bangladesh in 2041



Considering price of solar PV module will further decrease and more innovative technologies will be discovered. Based on data from 37 countries which had at least renewable energy installed capacity of 250 MW back in 2014 as well as more than 40% of RE electricity generation from solar energy alone, the result of regression model suggests that an additional increase in investment on clean energy by **USD 1 billion** contributes to install 1,413 MW renewable energy capacity.

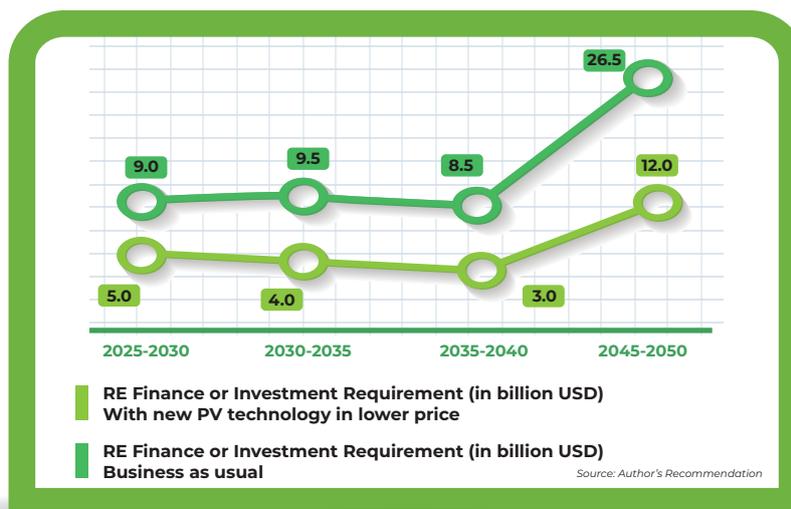
Figure 2: Price (\$/Watt) trend of Solar PV Module and its price growth (%)



Demand-Supply Gaps in RE Finance in Bangladesh

According to the results of OLS estimate that accounts both substitution and capital effect (due to shift in market structure, pricing strategies, policies and regulations) – to produce additional 17,000 MW installed capacity based on RE sources it may require roughly about USD 12.03 billion to invest (refer to Table 1). Combining the results of meta-analysis and OLS regression, to stimulate RE transition in electricity generation alone in Bangladesh by 2041, roughly USD 12.03 to USD 26.5 billion investment will be needed alone to develop the required installed capacity from renewable energy sources.

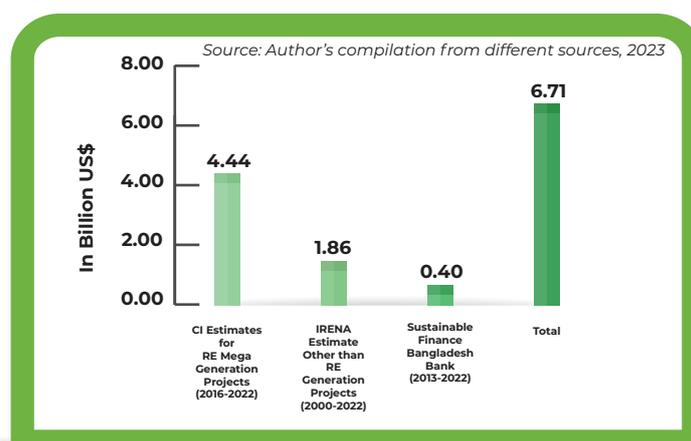
Figure 3: Investment Requirement to Meet RE based Electricity Generation Target by 2041



According to IRENA, as of July 2020 Bangladesh has had foreign investment of \$1.873 billion on RE sector including generation, transmission, and capacity building. Among multilateral financiers, ADB had 10 projects and IDA had 15. The finance is coming from climate funds, bilateral agencies as well as IDA.

Figure 04 provides an estimate of renewable energy financing to Bangladesh till date, based on the database prepared for this study as well IRENA's database on foreign investments in renewable energy in Bangladesh and Bangladesh Bank's data from Sustainable Finance's Quarterly reports:

Figure 4: Estimate of Renewable Energy Financing in Bangladesh as of 2022 (Illustrated)



The 2021-22 Climate Budget of Bangladesh states the following RE funded projects in Bangladesh

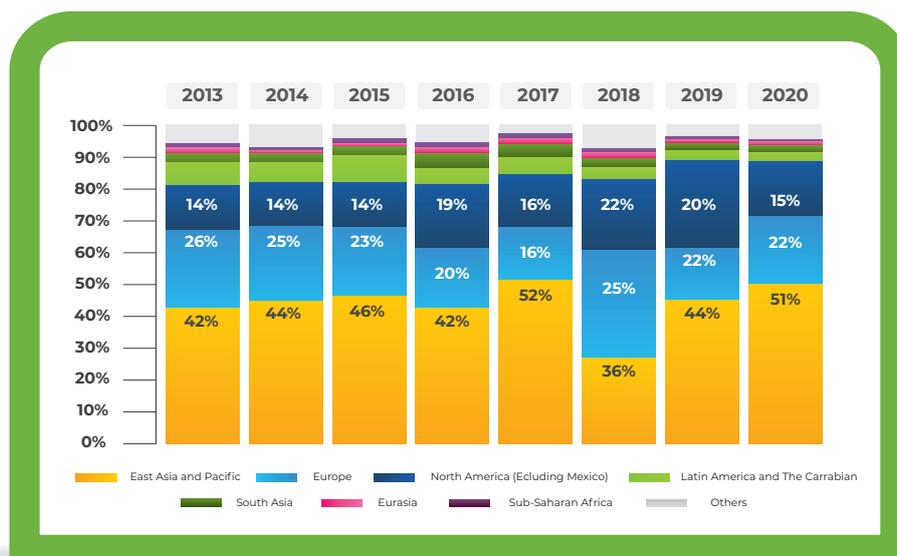
- USD 75 million 9 Climate Investment Fund funded projects
- USD 114 million from grants and USD 109 million from co-financing from Green Climate Fund.
- USD 1 billion over 5 years for several key issues among which renewable energy and research was one, in 2022, the US committed to provide to Bangladesh.

FOLLOWING

- Key risks in flow or allocation of RE finance in developing countries including Bangladesh
- Cost of capital (CO) as it is increasing due to climate vulnerability in LDCs (UNEP, 2018).
- High up-front costs for private investment, long time horizons for large infrastructure projects (IMF, 2022b).
- Climate solution (high-quality) suffer from regulation uncertainty (cost overruns, delays, and permit risk)
- DFI risk mitigation tools at wider scale (to meet needs, the public investment and/or the ratio of public to private investment, must further increase)
- Subsidizing scarce public funding for the fossil fuel industry in LDC.
- Economic risks investors face in LDCs are structural, e.g. exchange rate fluctuation, regulatory environments, and long term solutions (IMF, 2022b)

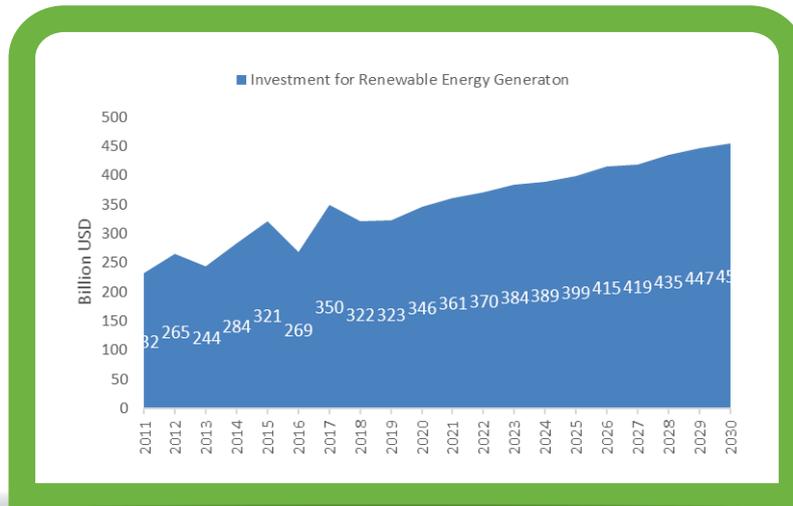
Though it was expected that vulnerability-based equity would be ensured in climate finance however, around 75% of all climate finance was concentrated in the North America, Western Europe, and East Asia & Pacific, primarily led by China (CPI, 2022).

Figure 5: Mechanism to Mobilize International and National Funds for RE in Bangladesh



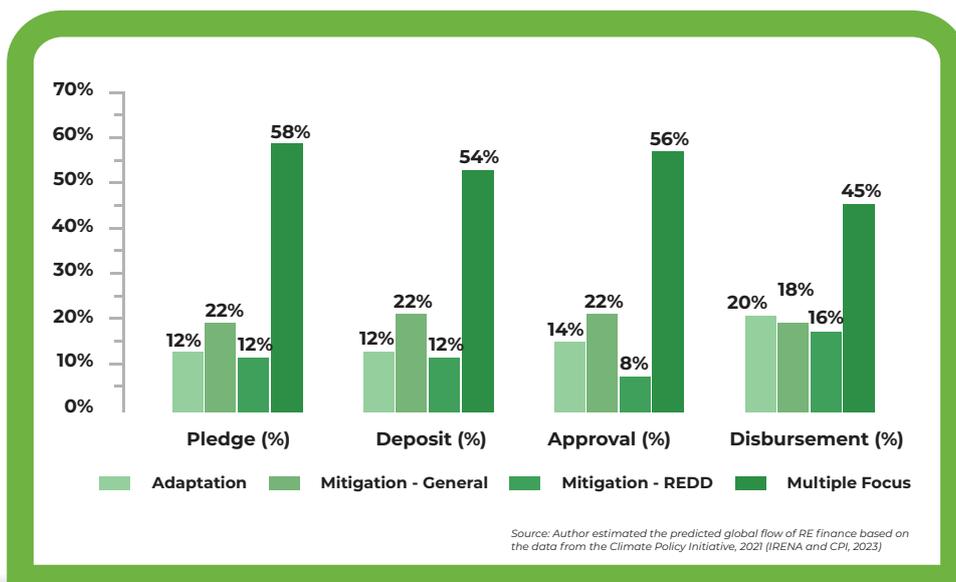
This study we have estimated that the overall investment global for RE generation the investment would be increased by almost double (\$456 billion) by 2030 compare to the same in 2011.

Figure 6: Predicted Flow of Global RE finance¹



- As a part of Cancun agreements in 2010, nations made the decision to create a Green Climate Fund in order to boost financial assistance for technology cooperation, mitigation, and adaptation in developing nations.
- Developed nations were USD 17 billion short of the 2020 climate finance commitment.
- Most of the funds that have been provided so far were given as loans and not grants. (Rich countries fall \$17bn short of 2020 climate finance goal, 2022). This will create further burden the developing nations so mainly providing grants should be in consideration.

Figure 7: Current scale of mitigation finance by solutions between 2011-2020 (USD bn)



¹Source: Author estimated the predicted global flow of RE finance based on the data from the Climate Policy Initiative, 2021 (IRENA and CPI, 2023)

Approximately US\$38.1 billion of blended finance from 2015-2020 was directed towards climate-focused opportunities. 80% of climate finance was provided in the form of debt or equity expecting market-rate returns on investment.

Figure 8: List of Potential Sources of Global Funds for RE projects

Source of Funds	Pledge Amount (Billion USD)
Clean Technology Fund (CTF)	7.90
Scaling Up Renewable Energy Program (SREP)	0.78
Global Energy Efficiency and Renewable Energy Fund (GEEREF)	0.28
Partnership for Market Readiness	0.13
Green Climate Fund IRM (GCF IRM)	5.16
GCF-PPF	17.60
Global Climate Change Alliance (GCCA)	1.65
Global Environment Facility (GEF5)	4.93
Total	38.44

Source: Climate Funds Update (2023)

A mitigation approach to address the problems caused by climate change is the generation of electricity from RE sources. In this respect, funds may be directly obtained from the following global sources: (a) the

Table 1: Major multilateral sources of Renewable Energy Finance and Disbursement Method

Major Multilateral Sources of RE Finance	Disbursement Method
Climate Investment Funds (CIF)-Scaling up Renewable Energy in Low Income Countries Program (SREP)	Grants, Contingent Grants, Concessional and Market-rate loans, Equity, Guarantees through MDBs and development aid (ODA)
Climate Investment Funds (CIF)	Grants, Contingent Grants, Concessional and Market-rate loans, Equity, Guarantees through MDBs (ADB, IFC, World Bank; and AIIB)
Climate Change Fund (CCF) by the Asian Development Bank (ADB)	Grants, Technical assistance, Direct Charge
Clean Energy Financing Partnership Facility (ADB)	Grants, Technical assistance
Green Climate Fund (GCF)	Grants, Loans, Equity Guarantees
Global Environmental Facilities	Grants, Concessional loans, Equity, Guarantees

Source: Climate Funds Update (2022)

National level sources of RE Finance in Bangladesh

A total of BDT 4.1452.03 billion has been given out by banks and financial institutions of Bangladesh as loans to renewable energy related venture, this is only 1.48% of their total loaned out amount for green finance 2.

Imposing Carbon Tax on Import of Fossil Fuels



- a.** If the NBR imposes 10% carbon tax the net revenue would be around \$9.0 billion by which around 1200 MW power could be generated from solar sources.
- b.** If the 25% CT is imposed on import of fossil fuels the revenue would be \$2.23 billion by which around at least 3000 MW renewable particularly solar based power could be generated.

Withdrawal of Subsidies to Fossil Fuels and Divert That for RE Expansion



- a.** Assuming the gradual reduction of the current subsidies will be a) 25% in 2025; 50% by 2030; c) 75% by 2035; and 100% by 2041. Therefore, the total savings from the subsidy to fossil fuels imports is estimated to be around \$4.358 billion from 2025 to 2041.

Savings from Capacity Charge Reduction



- a.** Assuming the decline of the capacity charge over the period by replacement of the RE generation, which are 10% by 2035 and 20% by 2041.
- b.** Estimated total savings would be around \$1.872 billion.

Conclusion

In conclusion, Bangladesh's vulnerability to climate change impacts necessitates a shift towards renewable and sustainable energy sources. However, currently, only a small percentage of Bangladesh's electricity is generated from renewable sources, falling short of the policy target. The financial burden of fossil-fuel based power generation and consumption is becoming a huge problem for BPDB, with increasing idle power plants and capacity charges paid by BPDB. Bangladesh needs to reduce its dependence on non-renewable energy sources and shift towards renewable sources. The country has received foreign investment in renewable energy, and the cost of solar PV modules is likely to decrease, making it more affordable to invest in renewable energy. It is essential for Bangladesh to receive climate finance to mitigate the effects of climate change and support the development of renewable energy. A significant increase in renewable energy capacity is required to fulfill Bangladesh's pledge to produce 40% of its power from renewable sources by 2041. To produce additional 17,000 MW installed capacity based on RE sources it may require roughly about USD 12.03 billion investment. Private, public and international investment should be mobilized to encourage growth in the renewable energy sector.

² See Annex 1

³ Total Savings = \$1.7 billion + \$637.5 million + \$318.75 million + \$1.7 billion (25% of \$1.7 billion) + (50% of \$1.275 billion) + (75% of \$637.5 million) + (\$1.7 billion)

⁴ International Institute for Sustainable Development, in 2019, the total fossil fuel subsidies in Bangladesh amounted to around \$1.7 billion

⁵ Total Savings = (10% of \$7.2 billion) + (20% of \$5.76 billion) (Detailed calculation is shown in the Annex)

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