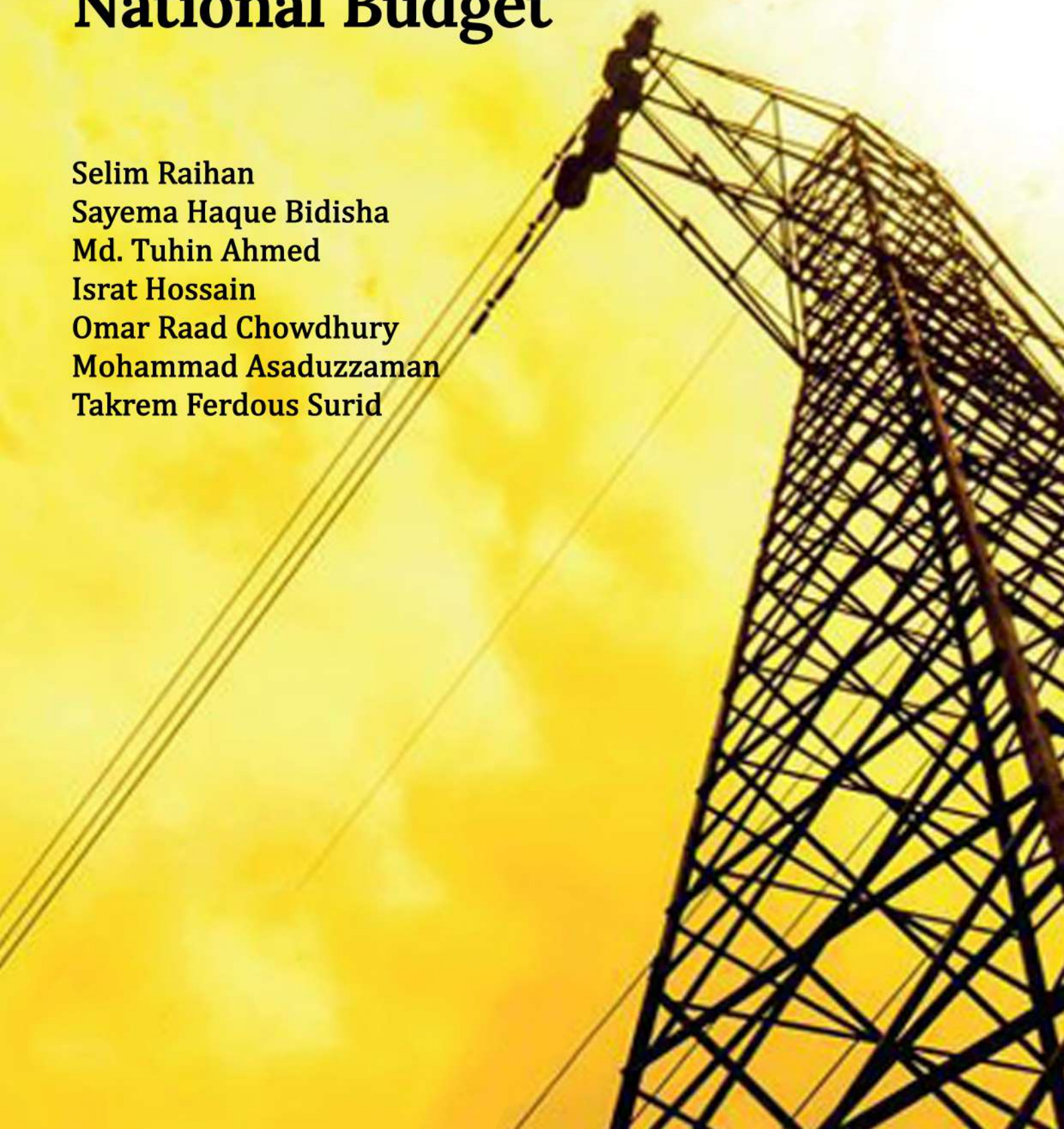


# **An Analysis of the Power and Energy Sector in the FY2023-24 National Budget**

**Selim Raihan  
Sayema Haque Bidisha  
Md. Tuhin Ahmed  
Israt Hossain  
Omar Raad Chowdhury  
Mohammad Asaduzzaman  
Takrem Ferdous Surid**





# **An Analysis of the Power and Energy Sector in the FY2023-24 National Budget**

**March 2024**

## **Authors**

### **Dr Selim Raihan**

Professor of Economics, University of Dhaka and Executive Director, SANEM

### **Dr Sayema Haque Bidisha**

Professor of Economics, University of Dhaka and Research Director, SANEM

### **Md. Tuhin Ahmed**

Lecturer of Economics, Mawlana Bhashani Science and Technology University,  
Santosh, Tangail-1902, Bangladesh and Research Fellow, SANEM

### **Israt Hossain**

Senior Research Associate, SANEM

### **Omar Raad Chowdhury**

Research Associate, SANEM

### **Mohammad Asaduzzaman**

Research Associate, SANEM

### **Takrem Ferdous Surid**

Research Associate, SANEM

## **Acknowledgement**

This study was carried out by the South Asian Network on Economic Modeling (SANEM) in partnership with Tara Climate Ltd. We want to express our heartfelt appreciation to Samantha Rahman (Research Associate, SANEM) and Most. Kaniza Muhshina (Research Associate, SANEM) for their invaluable assistance in gathering data for this study. Additionally, we extend our thanks to Sk. Ashibur Rahman (Assistant Director and Admin, SANEM) and Rafiul Ahmed (Research Assistant, SANEM) for their contributions in handling internal and external communications as well as providing logistical support throughout the study.

## © 2024 South Asian Network on Economic Modeling (SANEM)

**Disclaimer:** The views and observations presented in this report are those of the authors and do not necessarily reflect the views of the South Asian Network on Economic Modeling (SANEM) or Tara Climate Ltd. The authors are fully responsible for any errors/views/opinions contained in this research report.

**Published in March 2024**

**Citation:** Raihan, S., Bidisha, S. H., Ahmed, M. T., Hossain, I., Chowdhury, O. R., Asaduzzaman, M., & Surid, T. F. (2024). *An Analysis of the Power and Energy Sector in the FY2023-24 National Budget*. SANEM Publications, Dhaka, Bangladesh.

### **Published by**

#### **South Asian Network on Economic Modeling (SANEM)**

Flat K-5, House 1/B, Road 35, Gulshan 2

Dhaka 1212, Bangladesh

Phone: +88-02-58813075

Email: sanemnet@yahoo.com

<http://www.sanemnet.org>

**With support from Tara Climate Ltd.**

**Cover Design:** Rafiul Ahmed

### **Publisher**

#### **SANEM Publications**

252/3, North Goran, Khilgaon

Dhaka-1219, Bangladesh

### **ISBN Number**

**978-984-96752-5-9**

## **Table of Contents**

<i>List of Tables</i> .....	v
<i>List of Figures</i> .....	v
<i>Acronyms and Abbreviations</i> .....	vii
<i>Executive Summary</i> .....	ix
<i>1. Introduction</i> .....	1
<i>2. Context of the power and energy sector in the FY2023-24 national budget</i> .....	2
<i>2.1 Power generation</i> .....	2
<i>2.2 Overgeneration capacity</i> .....	6
<i>2.3 Power transmission, distribution and system loss</i> .....	7
<i>2.4 Cost of electricity generation</i> .....	9
<i>2.5 Capacity payment and subsidy</i> .....	10
<i>2.6 BPDB's operating loss</i> .....	10
<i>2.7 BPDB's costs of energy import</i> .....	11
<i>2.8 LNG scenarios</i> .....	12
<i>2.9 Renewable energy</i> .....	14
<i>3. An analysis of the power and energy sector in the FY2023-24 national budget</i> .....	15
<i>3.1 Budget allocation in the power and energy sector</i> .....	15
<i>3.2 Budgetary allocation in the energy sector</i> .....	18
<i>3.3 Budget allocation in the power sector</i> .....	20
<i>3.4 ADP allocation in the power and energy sector</i> .....	21
<i>3.5 Direct tax expenditure for the power and energy sector</i> .....	23
<i>4. Renewable energy in the FY2023-24 national budget</i> .....	24
<i>5. A critical analysis of the Integrated Energy and Power Master Plan (IEPMP) and its implication for the national budget</i> .....	26
<i>6. A fiscal space analysis for the implementation of the RE target for the national budget</i> ...	29
<i>7. Conclusion and policy recommendations</i> .....	33
<i>References</i> .....	36

## List of Tables

Table 1: Overgeneration capacity of power.....	7
Table 2: Cost of electricity generation and purchase .....	9
Table 3: BPDB's cost of energy import.....	12
Table 4: LNG import from Qatargas, OQT, and Spot Market (2018-2022) .....	13
Table 5: Projects to be commissioned during 2022-2027.....	13
Table 6: The progress of renewable energy in FY2022-23.....	14
Table 7: Change in budget allocation (%).....	16
Table 8: Change in budget allocation by divisions (%).....	17
Table 9: Change in EMRD budget allocation (%) .....	19
Table 10: Change in PD budget allocation (%).....	21
Table 11: Renewable energy allocation in Annual Development Plan (ADP) budget, FY2023-24 .....	25
Table 12: Estimated generation cost (BDT/kWh) of RE from 2025 to 2030.....	30
Table 13: Investment requirements by 2025 and 2030 under different scenarios.....	31
Table 14: Medium-term fiscal outlook.....	32

## List of Figures

Figure 1: Power installed capacity (MW).....	2
Figure 2: Share of power installed capacity in fuel mix (%) .....	3
Figure 3: Natural gas consumption by public sector power plants .....	3
Figure 4: Decline in domestic gas production .....	4
Figure 5: Coal consumption by public sector power plants .....	4
Figure 6: Consumption of liquid fuel by public sector power plants.....	5
Figure 7: Installed power generation capacity (MW) by sector for FY2022-23.....	5
Figure 8: Installed generation capacity of the public sector (MW) for FY2022-23.....	6
Figure 9: Installed generation capacity of the private sector (MW) for FY2022-23 .....	6
Figure 10: Installed generation capacity of joint ventures (MW) for FY2022-23 .....	6
Figure 11: Installed generation capacity of power import (MW) for FY2022-23 .....	6
Figure 12: Peak load versus expected generation capacity.....	7
Figure 13: Transmission line (ckt km) .....	8
Figure 14: Inter-utility power purchase for FY2022-23.....	8
Figure 15: Year-wise system loss (%) .....	9
Figure 16: Trend of subsidy and capacity payment .....	10
Figure 17: BPDB's operating loss .....	11
Figure 18: IPP's costs as a percentage of BPDB's total operating costs .....	11
Figure 19: Gas prices in different countries .....	12
Figure 20: Budget allocation for the power and energy sector .....	15
Figure 21: Budget allocation for the power and energy sector by divisions.....	16
Figure 22: EMRD, PD and MoPEMR budgets as a percentage of the total budget.....	17

<i>Figure 23: EMRD, PD and MoPEMR budgets as a percentage of GDP .....</i>	<i>18</i>
<i>Figure 24: Budget allocation for the EMRD .....</i>	<i>19</i>
<i>Figure 25: Share of the energy sector as a percentage of the power and energy sector .....</i>	<i>20</i>
<i>Figure 26: Budget allocation for PD.....</i>	<i>20</i>
<i>Figure 27: Share of the power sector as a percentage of the power and energy sector.....</i>	<i>21</i>
<i>Figure 28: Share of divisional ADP of the total MoPEMR ADP .....</i>	<i>22</i>
<i>Figure 29: Share of divisional and ministry ADP of the country's total ADP.....</i>	<i>22</i>
<i>Figure 30: Direct tax expenditure for the power and energy sector.....</i>	<i>23</i>
<i>Figure 31: Financing sources for the budget FY2023-24.....</i>	<i>30</i>
<i>Figure 32: RE share (generation) in 2030 energy mix.....</i>	<i>31</i>



## Acronyms and Abbreviations

10FYP	<i>Tenth Five Year Plan</i>
7FYP	<i>Seventh Five Year Plan</i>
8FYP	<i>Eighth Five Year Plan</i>
9FYP	<i>Ninth Five Year Plan</i>
ADP	<i>Annual Development Programme</i>
BDT	<i>Bangladeshi Taka</i>
BIDA	<i>Bangladesh Investment Development Authority</i>
BPDB	<i>Bangladesh Power Development Board</i>
BREB	<i>Bangladesh Rural Electrification Board</i>
CCPP	<i>Combined Cycled Power Plant</i>
CCS	<i>Carbon Capture and Storage</i>
CIF	<i>Cost, Insurance and Freight</i>
ckt.km	<i>Circuit Kilometer</i>
COP	<i>Conference of the Parties</i>
CVF	<i>Climate Vulnerable Forum</i>
DESCO	<i>Dhaka Electric Supply Company</i>
DPDC	<i>Dhaka Power Distribution Company</i>
EECMP	<i>Energy Efficiency and Conservation Master Plan</i>
EMRD	<i>Energy and Mineral Resources Division</i>
FY	<i>Fiscal Year</i>
GDP	<i>Gross Domestic Product</i>
GoB	<i>Government of Bangladesh</i>
GSMP	<i>Gas Sector Master Plan</i>
GW	<i>Gigawatts</i>
HFO	<i>Heavy Fuel Oil</i>
HSD	<i>High Speed Diesel</i>
IDCOL	<i>Infrastructure Development Company Limited</i>
IEPMP	<i>Integrated Energy and Power Master Plan</i>
IMF	<i>International Monetary Fund</i>
IOC	<i>International Oil Company</i>
IPP	<i>Independent Power Producer</i>
JICA	<i>Japan International Cooperation Agency</i>
KV	<i>Kilovolt</i>
kWh	<i>Kilowatt Hours</i>
LNG	<i>Liquefied Natural Gas</i>
MCCP	<i>Mujib Climate Prosperity Plan</i>
MCPP-M	<i>Mujib Climate Prosperity Plan-Maximal</i>
MCPP-R	<i>Mujib Climate Prosperity Plan-Realistic Scenario</i>
MKWh	<i>Million Kilowatt Hour</i>
MoPEMR	<i>Ministry of Power, Energy and Mineral Resources</i>
MW	<i>Megawatts</i>
NBR	<i>National Board of Revenue</i>
NDC Scenario	<i>Nationally Determined Contributions Scenario</i>
NDCs	<i>Nationally Determined Contributions</i>
NESCO	<i>Northern Electricity Supply Company Ltd</i>

<i>NWPGCL</i>	<i>North-West Power Generation Company Limited</i>
<i>PD</i>	<i>Power Division</i>
<i>PGCB</i>	<i>Power Grid Company of Bangladesh Ltd.</i>
<i>PP</i>	<i>Perspective Plan</i>
<i>PSMP</i>	<i>Power Sector Master Plan</i>
<i>RE</i>	<i>Renewable Energy</i>
<i>RPCL</i>	<i>Rural Power Company Limited</i>
<i>RPGCL</i>	<i>Rupantarita Prakritik Gas Company Limited</i>
<i>SDG</i>	<i>Sustainable Development Goals</i>
<i>SEAs</i>	<i>Strategic Environmental Assessments</i>
<i>SREDA</i>	<i>Sustainable and Renewable Energy Development Authority</i>
<i>TBS</i>	<i>The Business Standard</i>
<i>UK</i>	<i>United Kingdom</i>
<i>UN</i>	<i>United Nations</i>
<i>US</i>	<i>United States</i>
<i>VAT</i>	<i>Value Added Tax</i>
<i>WZPDC</i>	<i>West Zone Power Distribution Company</i>

## Executive Summary

There is no denying that, to sustain Bangladesh's growth momentum and address its development challenges, a continuous and uninterrupted energy supply is a prerequisite. Currently, the energy landscape of Bangladesh is primarily characterized by natural gas, with over half of the electricity being generated from domestic natural gas and imported Liquefied Natural Gas (LNG). The remaining power generation comes from sources such as coal, diesel, furnace oil, hydro, and solar (BPDB, 2022). However, the increasing reliance on LNG, especially considering its volatile and expensive nature as an imported energy source, has put significant pressure on the national budget.

In this context, recent disruptions in the global energy supply chain resulting from the Russia-Ukraine war and the ongoing COVID-19 pandemic have further escalated the costs associated with imported energy. Additionally, growing environmental concerns about the adverse effects of heightened fossil fuel consumption, combined with the target of achieving 30% renewable energy (RE) in the country's total energy mix by 2030, demand a comprehensive assessment and immediate focus on budget allocation and policy planning.

During the fiscal year 2021-22, Bangladesh achieved the significant milestone of providing electricity access to its entire population. Moreover, the country has set ambitious goals for electricity generation, aiming to produce 40,000 megawatts by 2030 and 60,000 megawatts by 2041. However, challenges persist in this context, which include frequent disruptions in electricity generation and the high costs associated with various energy sources. These issues not only have negative consequences on the production processes but also place a burden on daily activities and household expenses.

When it comes to clean energy, the Government of Bangladesh (GoB) has outlined clear targets. By 2041, the aim is to generate 40% of the nation's electricity from clean sources. In pursuit of this transformation towards clean and renewable energy, the government recently introduced the "Mujib Climate Prosperity Plan" in November 2022. This plan sets even more ambitious RE targets, with the objective of achieving 30% RE by 2030 and 40% by 2041. In this connection, there is also no denying that achieving the goals outlined in the national plans requires comprehensive and long-term financial planning. To successfully meet the targets set forth in policy documents, it is imperative to reconsider and revamp the national budget for the MoPEMR in terms of both expenditure and financing.

In the context of the FY2023-24 budget, it is worth noting that the allocation for the Ministry of Power, Energy, and Mineral Resources (MoPEMR) amounted to BDT 34,819 crore, which represented 4.6% of the national budget and 0.70% of the country's GDP (MoF, 2023). However, within this allocation, there was a notable disparity between the Power Division (PD) and the Energy and Mineral Resources Division (EMRD).

The Power Division (PD) received an allocation of BDT 33,825 crore, marking a substantial 33.8% increase compared to the previous fiscal year. In contrast, the Energy and Mineral Resources Division (EMRD) was allocated only BDT 994 crore, indicating a significant decrease of 47.7% when compared to the previous year. This allocation trend raises concerns about

the prioritization of power generation over energy resource exploration and domestic energy capacity.

When analyzed over the past years, the budgetary allocation for both the PD and MoPEMR has shown a decreasing trend as a percentage of the total budget, with a slight increase observed in FY2023-24, reaching 4.4% and 4.6% respectively. In absolute terms, the budget for EMRD has consistently declined since FY2018-19, dwindling to a mere 0.1% of the total budget. In contrast, the budget for the Power Division has witnessed positive growth. This budgetary discrepancy reflects a potential focus on short-term gains in power generation, often reliant on fuel imports, at the expense of domestic energy capacity and security. This approach risks missing opportunities for significant exploration efforts and substantial growth in renewable energy (RE).

Recognizing the urgency of aligning budgetary priorities with the ambitious targets set in various policy documents for different energy sources, it is crucial to conduct a comprehensive review and redesign the national budget of the Ministry of Power, Energy, and Mineral Resources (MoPEMR). Such a reevaluation should consider both spending and financing aspects, with a focus on achieving long-term energy sustainability, resource exploration, and security, as outlined in the policy objectives.

In the proposed FY2023-24 budget, there also seems to be a notable absence of a concrete action plan for renewable energy (RE) beyond the reaffirmation of targets. While the budget document restates the objectives of achieving 40% from clean energy by 2041, there is a lack of detailed initiatives or strategies to make these targets a reality.

A closer look at the projects listed in the Annual Development Program (ADP) under the power and energy sector reveals that only a handful of them are focused on renewable energy. Furthermore, it's noteworthy that most of these RE projects appear to be continuations of initiatives from previous years. Additionally, three out of the six renewable energy projects have been allocated lower funding in this fiscal year. As a whole, the total ADP allocation for the power and energy sector has declined by 2.5%. In terms of fiscal incentives for clean energy, apart from the exemption of advance import tax on solar desalination plants to produce fresh water, there were no specific fiscal incentives, instead, there were steps towards encouraging the use of fossil fuel (e.g., removing 15% VAT and 5% advance tax on the import of petroleum goods and furnace oil).

In light of the challenges and opportunities outlined in the preceding analysis, it is evident that Bangladesh's energy sector is at a critical juncture, requiring thoughtful and strategic policy interventions. The following policy recommendations offer a roadmap for GoB to align its financial planning and strategic initiatives with its ambitious clean energy targets, promote energy resource exploration, and foster long-term energy sustainability and security.

***Reducing the fiscal burdens relating to the energy sector:*** In order to create a more inclusive power and energy sector and to allocate more resources to domestic gas exploration and developments of RE, steps should be taken to reduce the cumulative effects of capacity payment, subsidies, and direct tax expenditures.

***Overcoming the deadlocks on the way to domestic gas exploration through budgetary stimulus:*** Prioritizing domestic gas production should be one of the core strategies and in this connection, building new power plants should be conditioned upon domestic gas availability and the budget allotted to the EMRD should be structured in line with such an objective.

***Formulating a single coordinated policy document for the overall power and energy sector and RE:*** The existing policy documents related to the energy sector need to be revisited and the strategic goals and targets should be in alignment. There should be a unique guiding principle and a single coordinated plan with certain core national objectives in terms of energy strategy.

***Ensuring transparency and accountability of the existing regulatory and implementing authorities:*** The government must ensure transparency and accountability in the process of setting tariffs and energy prices by strengthening the existing regulatory institution, namely, the Bangladesh Energy Regulatory Commission (BERC). The implementation capacity of BAPEX and SREDA must also be enhanced for autonomous operation.

***Formation of a separate segment in the national budget for RE and a separate division at the ministry level for facilitating RE:*** As in practice in India, a separate segment with highlighted provisions in the budget and a separate division at the ministry level are required for facilitating RE.

***Promoting private investment in RE through adequate budgetary incentives:*** In order to attract FDIs and private investments in RE, the national budget has to offer appropriate incentives and policy stimulus.

***Providing fiscal incentives for RE:*** In the national budget, exemption/reduction of relevant duties on RE-related products should be considered.

***Exploring cost-effective use of battery storage for flexible generation of RE:*** In order to have an efficient and cost-effective storage system of RE, more research is needed to accommodate battery storage systems with grid-scale solar projects, install power-mix mobility in the system, and reduce oil-based power generation. Sufficient allocation in the energy and power sectors' budget is necessary for making these technologies commercially viable.

***Popularizing solar-powered irrigation in rural Bangladesh:*** Utilizing solar power in the irrigation system and thereby replacing diesel-based irrigation systems in Bangladesh has the potential to ensure an uninterrupted and green energy supply. Budgetary incentives will be crucial to popularize the solar irrigation system.

***Motivating the private sector towards RE and resolving the conflict of interests in the power sector:*** Necessary steps in terms of relevant policies and budgetary incentives are needed to tackle the vested interests of big business blocks and to encourage big business enterprises to gradually shift the investment to RE.

## 1. Introduction

There is no denying that to continue the growth momentum of Bangladesh and to meet the development challenges of the country, a continuous and uninterrupted supply of energy is a prerequisite. The energy landscape of the country is primarily characterized by natural gas with more than half of the electricity being generated by domestic natural gas and imported Liquefied Natural Gas (LNG) and the rest of the power generation is sourced from coal, diesel, furnace oil, hydro and solar (BPDB, 2022). However, the increasing dependence on LNG against the backdrop of the volatile and costly source of imported energy has created tremendous pressure on the government budget. In this context, the disruption in the global energy supply chain due to the recent Russia-Ukraine war and the COVID-19 pandemic has made imported energy more costly. On the other hand, the growing environmental concern about the negative consequences of increased use of fossil fuel, coupled with the target of attaining 30% renewable energy (RE) in the total energy mix of the country by 2030 requires a thorough assessment and immediate focus in terms of budgetary allocation as well as policy planning.<sup>1</sup>

During FY2021-22, the country has been able to cover all of its population under electricity facilities. Its electricity generation target is set at 40,000 megawatts by 2030 and 60,000 megawatts by 2041.<sup>2</sup> However, the frequent disruption in electricity generation as well as the high cost of different sources of energy have not only negatively affected the production processes but also is hampering the day-to-day activities and putting pressure on household expenditure. When it comes to clean energy, the GoB has set the target of producing 40% of the nation's electricity from clean sources by 2041. In this regard, to attain an energy transformation towards clean and RE, the government has recently formulated the “Mujib Climate Prosperity Plan” in November 2022 which sets an ambitious RE target of attaining RE target of 30% by 2030 and 40% by 2041.<sup>3</sup>

Detailed and long-term financial planning is needed to attain the targets as outlined in the national plans. In the FY 2023-24 budget, the allocation for the Ministry of Power, Energy and Mineral Resources (MoPEMR) was BDT 34,819 crore, which was 4.6% of the national budget and 0.70% of the GDP (MoF, 2023). Moreover, the recent trends of budgetary allocation give rise to serious concern as to the effectiveness of resource mobilization for the transition to clean and renewable energy as stated in various plans of the GoB. Therefore, for attaining the targets as set by the policy documents the national budget of the MoPEMR needs to be re-designed in terms of both spending as well as financing.

Against this backdrop, this study undertakes an analysis of the power and energy sector in the national budget for FY2023-24. Briefly, it analyzes the context of the power and energy sector in the national budget for FY2023-24. Putting RE at the forefront, this study investigates the

---

<sup>1</sup> During the COP-26, the Prime Minister of Bangladesh announced to meet the RE target of 30% by 2030 and 40% by 2041. Afterwards, the 40% renewable energy target has been replaced by 40% clean energy target including nuclear powerplant with other renewable sources.

<sup>2</sup> <https://www.thedailystar.net/business/economy/news/100pc-population-comes-under-electricity-coverage-2983111>

<sup>3</sup> [https://mujibplan.com/wp-content/uploads/2021/12/Mujib-Climate-Prosperity-Plan\\_ao-21Dec2021\\_small.pdf](https://mujibplan.com/wp-content/uploads/2021/12/Mujib-Climate-Prosperity-Plan_ao-21Dec2021_small.pdf)

priorities of the national budget FY2023-24 with respect to RE. It incorporates a critical analysis of the Integrated Energy and Power Master Plan (IEPMP) and its implication for the national budget. It also provides an overview of the fiscal space for attaining the RE target for the national budget. Finally, it highlights some policy suggestions for the power and energy sector in the national budget for FY2023-24 considering the shortfalls in the energy sector and the government’s stated commitment towards energy security and clean and RE targets.

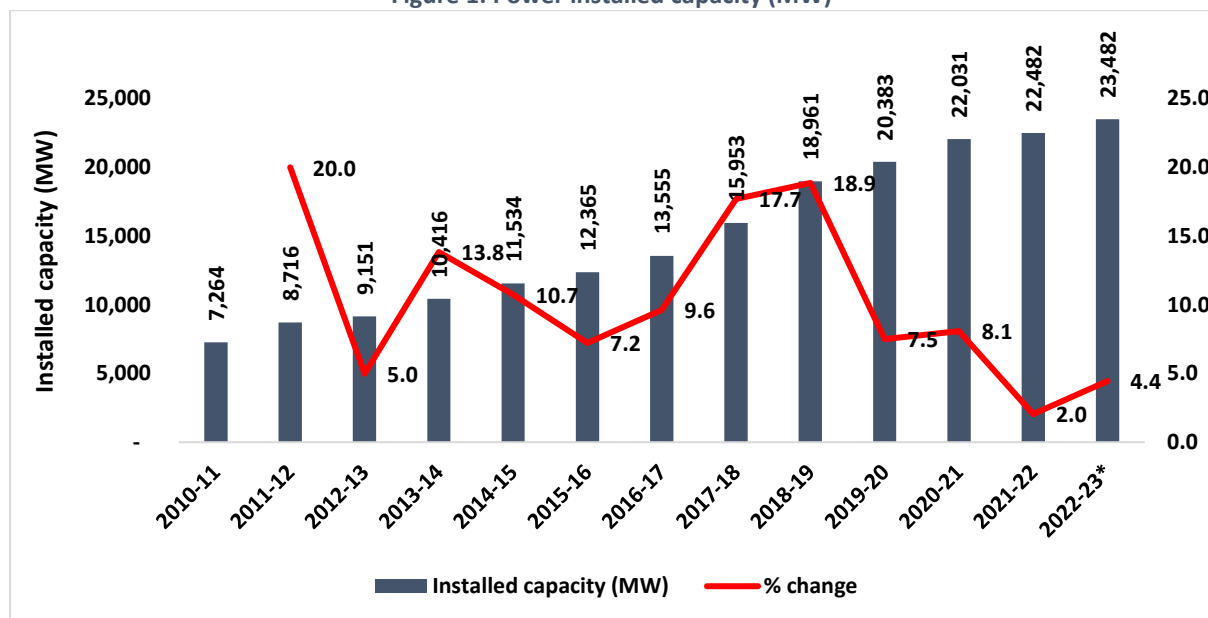
## 2. Context of the power and energy sector in the FY2023-24 national budget

Before delving into the national budget for FY2023-2024, it is crucial to grasp the challenges and opportunities that the power and energy sector faces. This section, therefore, provides an overview of the country’s power and energy sector.

### 2.1 Power generation

Over the years, there has been a notable growth in the capacity for generating power through grid-based systems (Figure 1). The installed capacity for grid-based power generation reached 23,482 megawatts in FY2022-23. This represents a 4.4% increase when compared to the capacity in FY2021-22. However, it's important to note that the rate of growth in power generation capacity has been on a declining trend since FY2018-19.

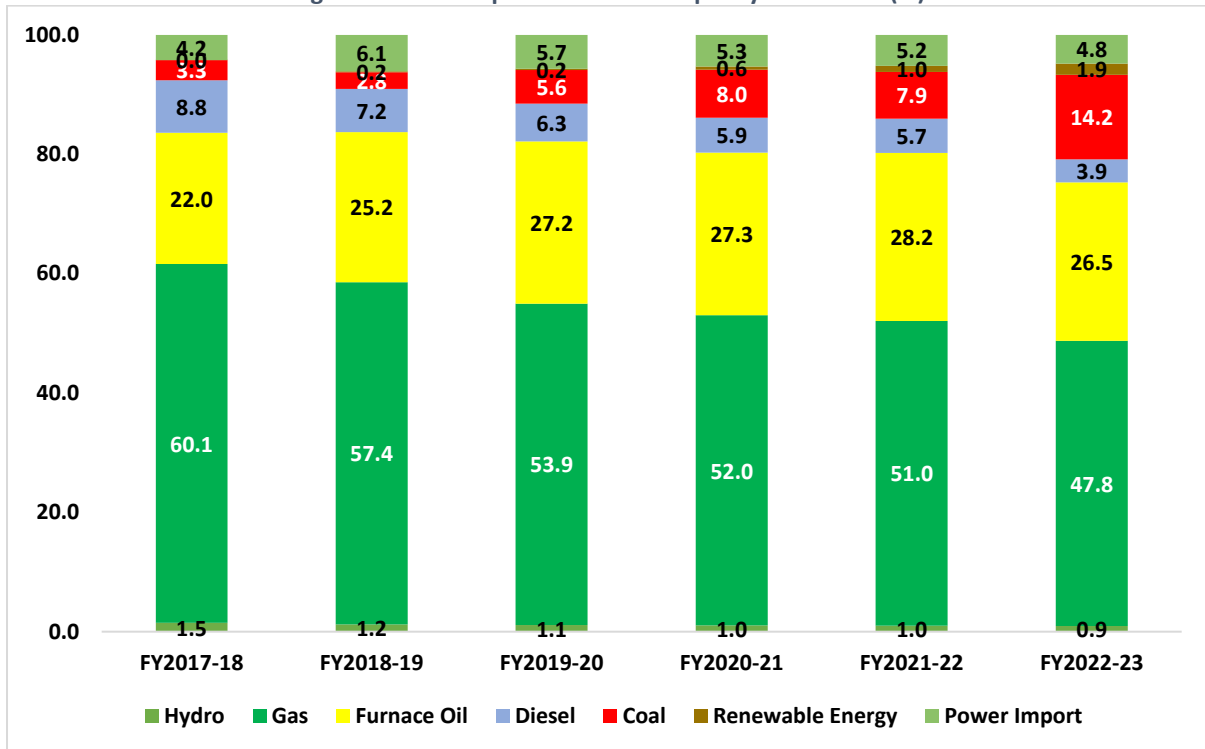
Figure 1: Power installed capacity (MW)



Source: Power Division (\*Up to January 2023)

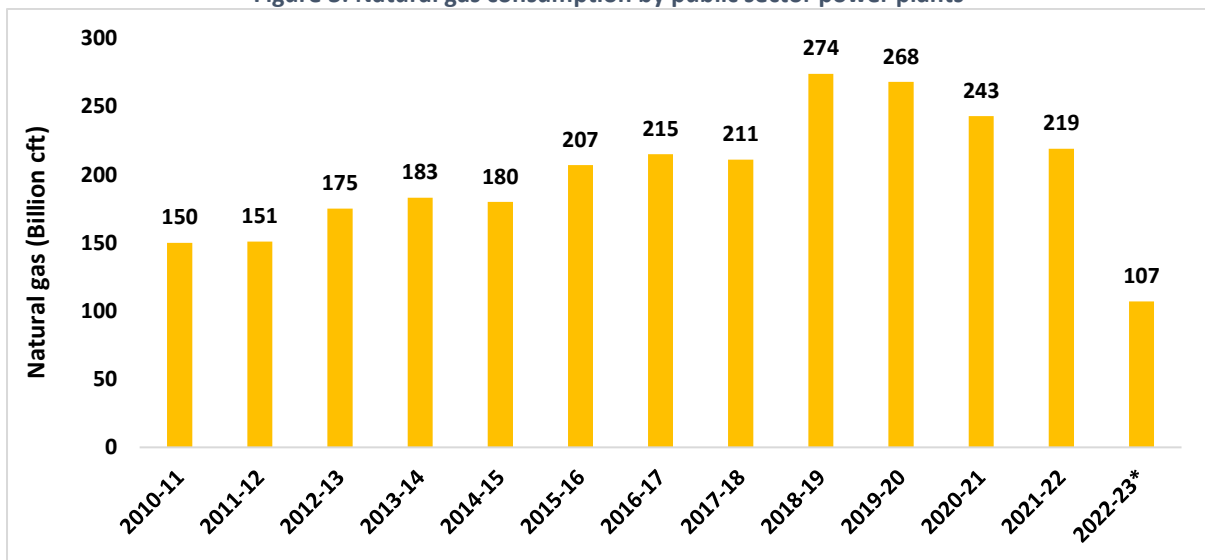
In FY2022-23, the bulk of power generation capacity was sourced from natural gas, accounting for a significant 47.8% of the fuel mix (Figure 2). Following closely behind was furnace oil, contributing 26.5% to the overall capacity. Coal held a substantial portion at 14.2%, while power imports represented 4.8% of the total capacity. Diesel contributed 3.9%, and renewable energy sources played a smaller but growing role, accounting for 1.9% of the capacity. Hydropower had the smallest share, making up 0.9% of the fuel mix.

Figure 2: Share of power installed capacity in fuel mix (%)



Source: Annual Reports from 2017-2023, Bangladesh Power Development Board

Figure 3: Natural gas consumption by public sector power plants

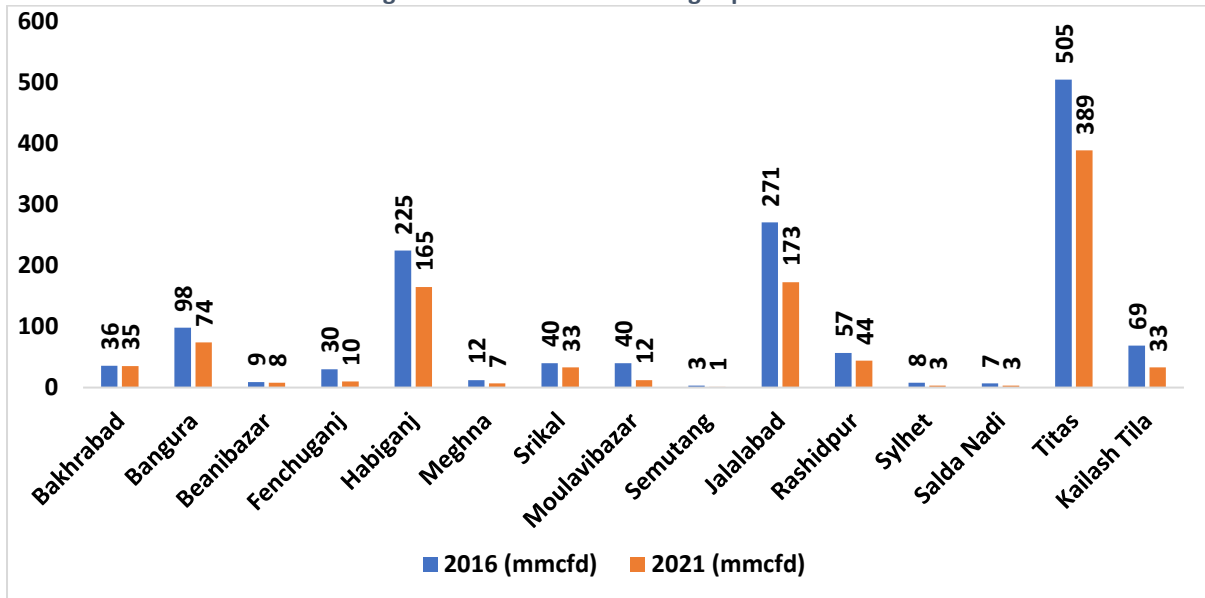


Source: Power Division (\*Up to January 2023)

In recent years, there has been a notable shift in the composition of the fuel mix. The proportion of natural gas within the fuel mix has declined from 60.1% in FY2017-18 to 47.8% in FY2022-23 (Figure 2). This decrease can be attributed to reduced consumption of natural gas by public sector power plants since FY2017-18 (Figure 3). Furthermore, this decline in natural gas consumption by public sector power plants can be linked to the drop in domestic gas production between 2016 and 2021 (Figure 4).



Figure 4: Decline in domestic gas production



Source: Petrobangla (2022)

Conversely, there has been a notable rise in the coal component within the fuel mix, with its share increasing from 3.3% in FY2017-18 to 14.2% in FY2022-23. This uptick in coal utilization can be attributed to the consumption of coal by public sector power plants since FY2019-20 (Figure 5).

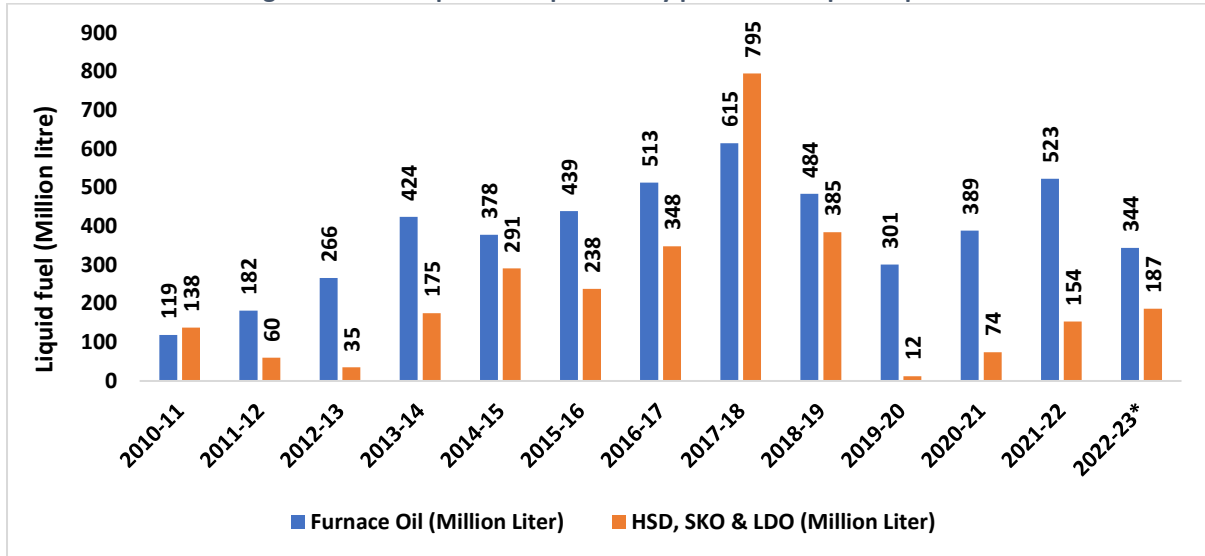
Figure 5: Coal consumption by public sector power plants



Source: Power Division (\*Up to January 2023)

The share of furnace oil within the fuel mix has risen to 26.2% in FY2022-23 from 22.0% in FY2017-18 (Figure 2). This increase can be linked to the greater consumption of furnace oil observed over the past few years (Figure 6).

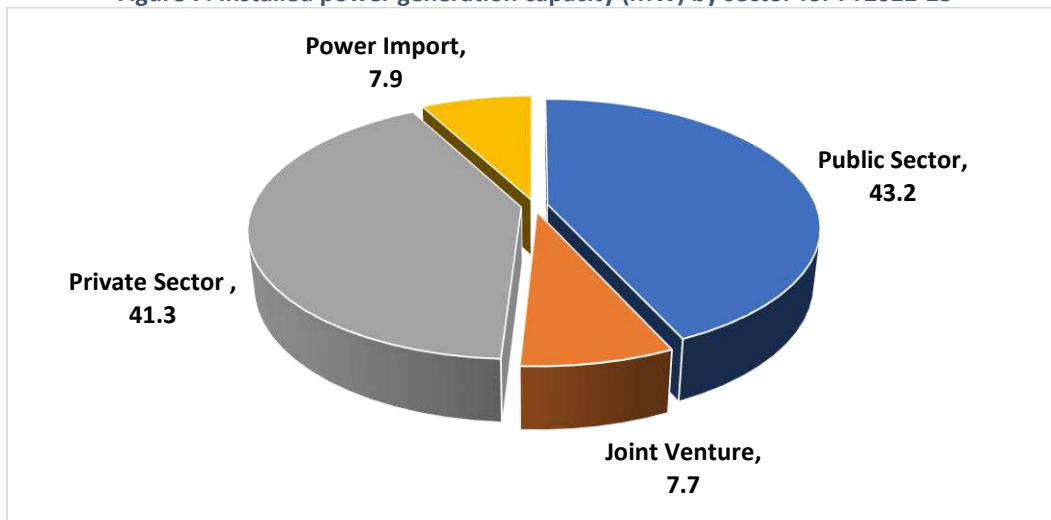
Figure 6: Consumption of liquid fuel by public sector power plants



Source: Power Division (\*Up to January 2023)

In addition to these changes, there has been a slight increase in the share of renewable energy within the fuel mix, rising from 0.0% in FY2017-18 to 1.9% in FY2022-23, as shown in Figure 2. Over the same period, the share of power imports in the fuel mix remained relatively unchanged, ranging from 4% to 6% from FY2017-18 to FY2022-23. However, during this timeframe, there has been a slight decline in the shares of both diesel and hydropower within the fuel mix.

Figure 7: Installed power generation capacity (MW) by sector for FY2022-23



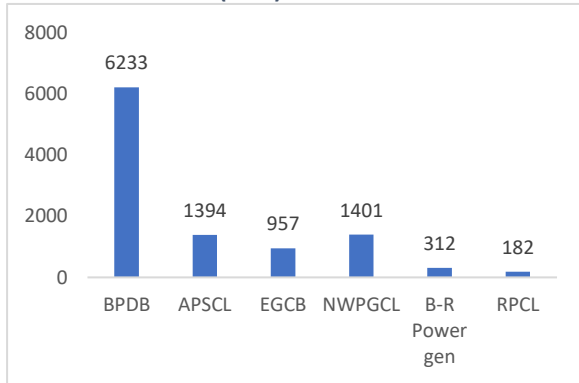
Source: Bangladesh Power Development Board (2023)

Figure 7 provides insights into the installed power generation capacity for FY2022-23, categorized by sector. The public sector held the majority with a power generation capacity of 43.2%, followed closely by the private sector at 41.3%. Additionally, power import contributed 7.9% of the capacity, while joint ventures accounted for 7.7%.

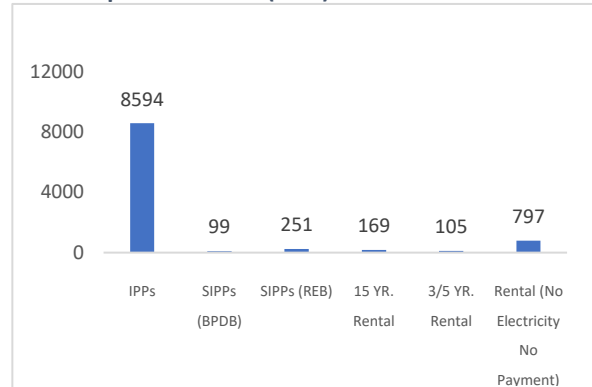
Within the public sector, the primary power producer is BPBD, as depicted in Figure 8. Meanwhile, in the private sector, Independent Power Producers (IPPs) take the lead in power

generation (Figure 9). For joint ventures, the main producer is the Bangladesh-China Power Company Limited (BCPCL), highlighted in Figure 10. Lastly, our primary source of power import comes from Bheramara HVDC (India), as shown in Figure 11.

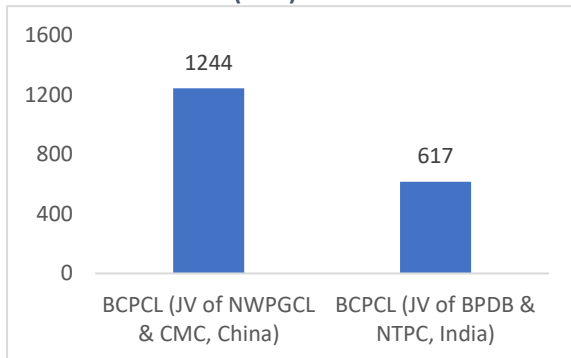
**Figure 8: Installed generation capacity of the public sector (MW) for FY2022-23**



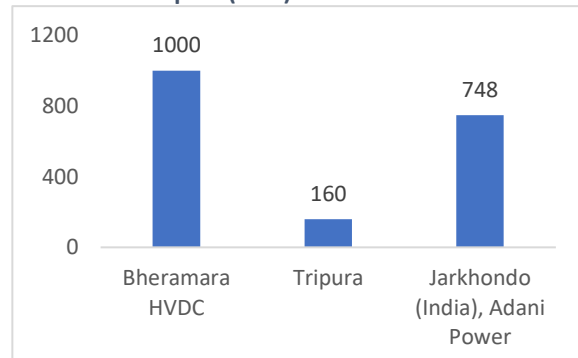
**Figure 9: Installed generation capacity of the private sector (MW) for FY2022-23**



**Figure 10: Installed generation capacity of joint ventures (MW) for FY2022-23**



**Figure 11: Installed generation capacity of power import (MW) for FY2022-23**



Source: Bangladesh Power Development Board (2023)

## 2.2 Overgeneration capacity

Over the years, there has been a consistent trend where the maximum power generation falls short of the installed capacity, resulting in a surplus of power generation capacity. This overcapacity in power generation has grown significantly, reaching 9,497 megawatts in FY2022-23, compared to 2,374 megawatts in FY2010-11 (Table 1). Moreover, the proportion of overcapacity in relation to the installed capacity has also risen over time. In FY2022-23, this overcapacity accounted for 40.4% of the total installed capacity, signifying that approximately 40.4% capacity of power plants remains underutilized.

Even though there is an excess generation capacity, the country has struggled to fulfil its peak electricity demand over the past few years. This shortfall can be attributed primarily to fuel shortages and the inefficiency of power plants (Moazzem, 2019), which have led to the underutilization of their full capacity.

The Power System Master Plan (PSMP) of 2016 presented a more reasonable forecast of the expected peak electricity demand, aligning it with the expected generation capacity (Figure 12). Nevertheless, a significant limitation of the plan was its heavy reliance on imported primary energy sources and the absence of renewable energy options. The PSMP 2016

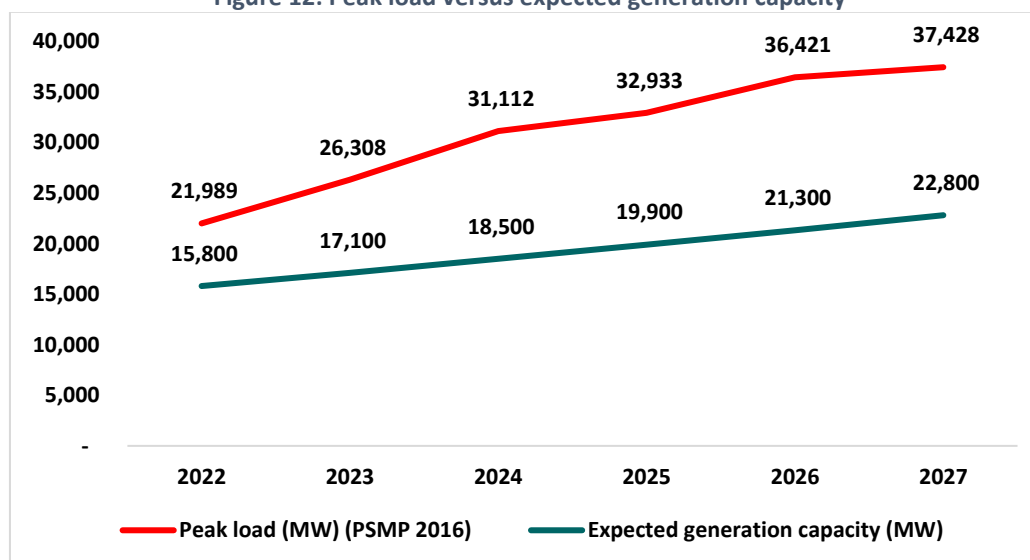
primarily emphasized the use of more cost-effective gas sources (LNG/local) and imported coal, as opposed to the expensive and inefficient use of oil, to meet peak demand. Due to the shortage of foreign currency, the country had to suspend spot purchases of LNG and imports of other fuels, which ultimately led to the recent energy and power crisis.

**Table 1: Overgeneration capacity of power**

Fiscal Year	Installed capacity (MW)	Maximum generation (MW)	Overcapacity (per max generation) (MW)	% share of overcapacity of installed capacity
2010-11	7,264	4,890	2,374	32.7
2011-12	8,716	6,066	2,650	30.4
2012-13	9,151	6,434	2,717	29.7
2013-14	10,416	7,356	3,060	29.4
2014-15	11,534	7,817	3,717	32.2
2015-16	12,365	9,036	3,329	26.9
2016-17	13,555	9,479	4,076	30.1
2017-18	15,953	10,958	4,995	31.3
2018-19	18,961	12,893	6,068	32.0
2019-20	20,383	12,738	7,645	37.5
2020-21	22,031	13,792	8,239	37.4
2021-22	22,482	14,782	7,700	34.2
2022-23*	23,482	13,985	9,497	40.4

Source: Power Division (\*Up to January 2023)

**Figure 12: Peak load versus expected generation capacity**

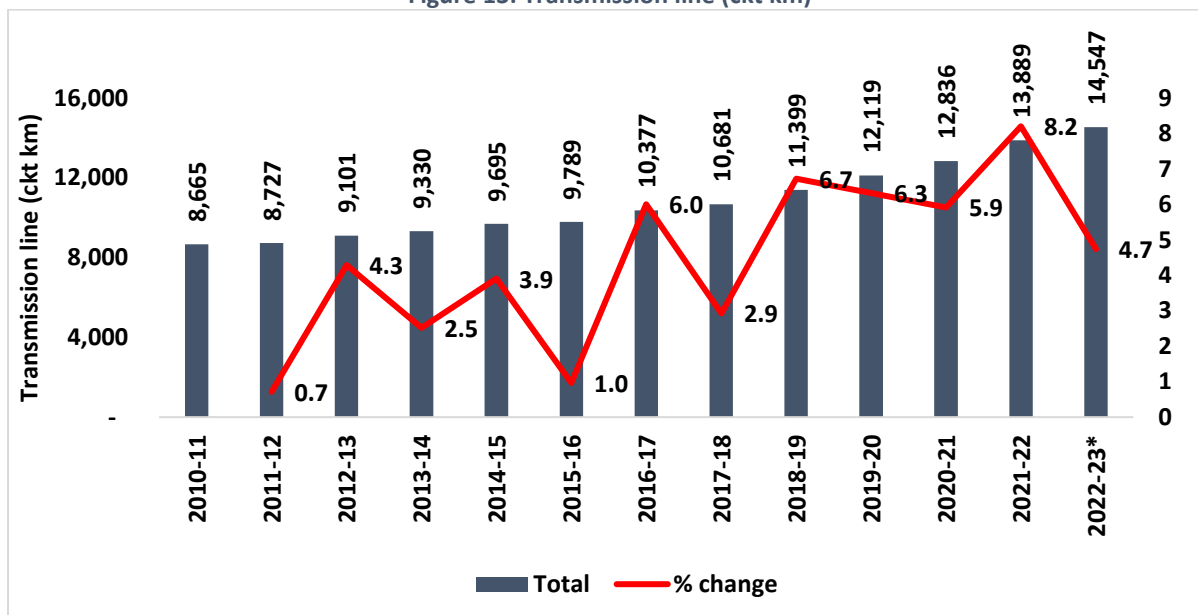


Source: PSMP (2016) and TBS (2023)

### 2.3 Power transmission, distribution and system loss

The Power Grid Company of Bangladesh Ltd. (PGCB) is tasked with the operation, maintenance, and expansion of the transmission systems across Bangladesh. Thanks to enhancements in the transmission infrastructure, there has been a steady growth in the length of transmission lines over the years. Specifically, the total transmission line length has expanded from 8,665 circuit kilometres in FY2010-11 to 14,547 circuit kilometres in FY2022-23 (Figure 13).

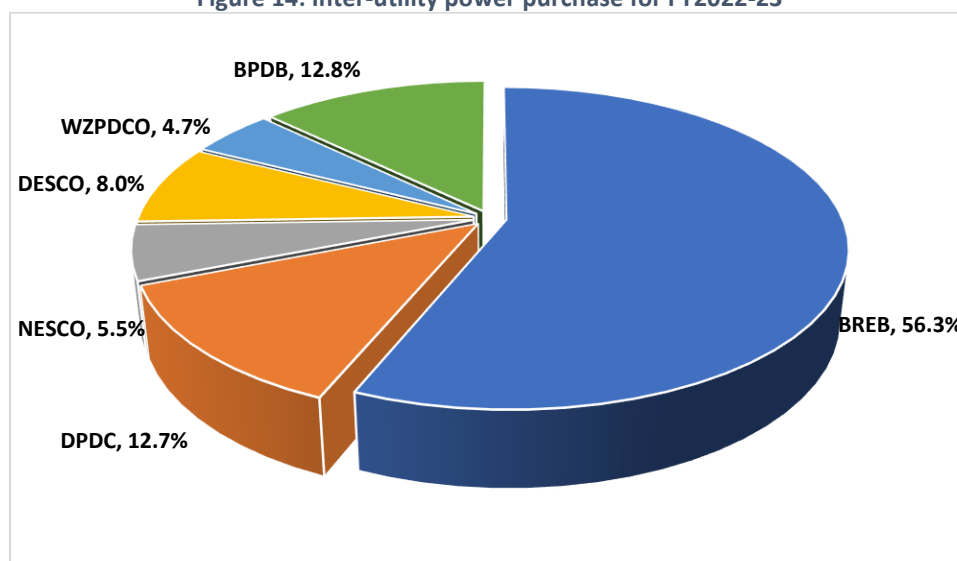
Figure 13: Transmission line (ckt km)



Source: Power Division (\*Up to January 2023)

In terms of electricity distribution, the responsibility falls upon six organizations or utilities, namely the Bangladesh Power Development Board (BPDB), the Bangladesh Rural Electrification Board (BREB), the Dhaka Power Distribution Company (DPDC), the Dhaka Electric Supply Company (DESCO), the West Zone Power Distribution Company (WZPDC), and the Northern Electricity Supply Company Ltd (NESCO). These distribution utilities collectively procured 80,285 megawatt-hours (MKWh) and 41,952 MKWh of electricity at 33 KV and 132 KV levels, respectively, during FY2022-23 (up to December 2022). The distribution of purchased electricity by these different utilities is detailed in Figure 14, with BREB emerging as the primary distributor.

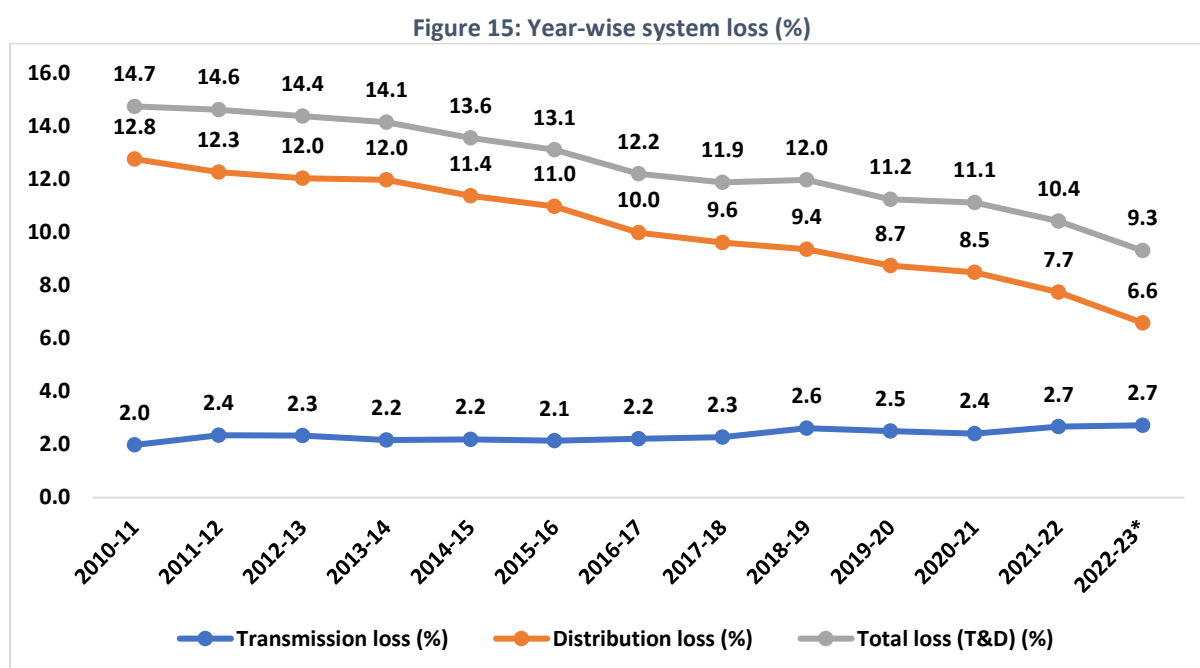
Figure 14: Inter-utility power purchase for FY2022-23



Source: Power Division

A critical performance indicator for these distribution entities is system loss. Various measures, including ongoing performance monitoring of power sector reforms and targeted

initiatives, have been put in place to reduce system losses. However, as of FY2022-23, system loss remains relatively high at 9.3% (Figure 15). To attain the desired performance levels within the sector, further efforts are needed to bring down system losses.



Source: Power Division (\*Up to December 2022)

## 2.4 Cost of electricity generation

**Table 2: Cost of electricity generation and purchase**

	FY2020-21		FY2021-22		% change in amount
	Amount (BDT crore)	Cost (BDT/kWh)	Amount (BDT crore)	Cost (BDT/kWh)	
BPDB's generation	6,743.9	4.4	8,014.7	5.0	18.8
Purchase from IPP	27,737.4	8.0	49,213.3	11.6	77.4
Purchase from Rental	3,328.2	7.5	2,789.4	9.8	-16.2
Purchase from Public Plant	6,917.0	4.3	7,013.8	4.8	1.4
Purchase from India	4,712.9	5.8	4,673.2	6.1	-0.8
Interest on Budgetary Support	1,294.8	0.2	1,294.8	0.2	0.0
Provision for Power Sector Development Fund	1,144.7	0.2	1,224.1	0.2	6.9
<b>Total</b>	<b>51,879.0</b>	<b>6.6</b>	<b>74,223.3</b>	<b>8.8</b>	<b>43.1</b>

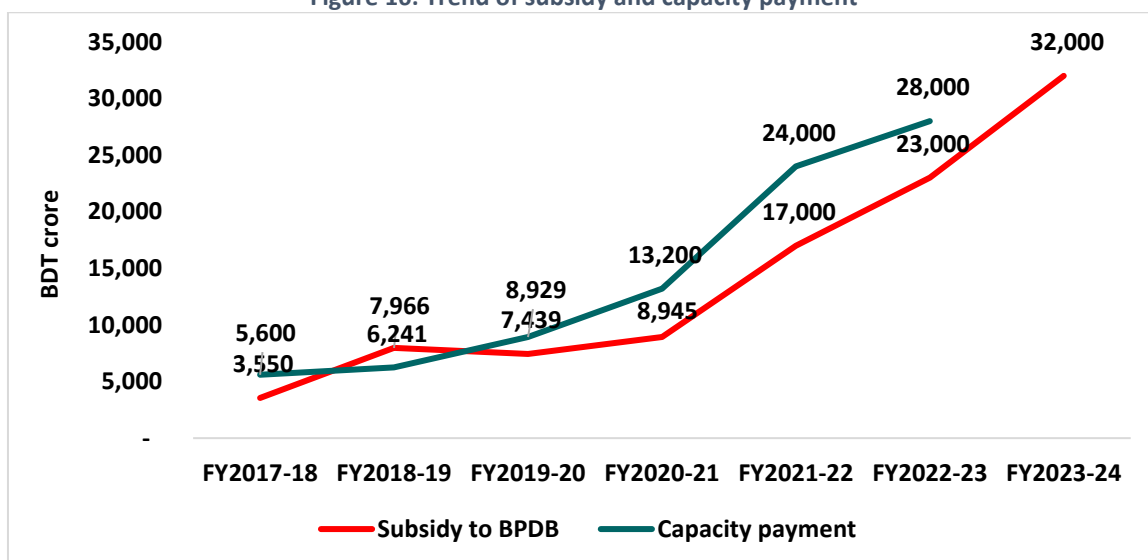
Source: Annual Report 2021-22, Bangladesh Power Development Board (BPDB)

To address the increasing demand for electricity, BPDB places a strong emphasis on its own power generation and procures electricity from various sources, including Independent Power Producers (IPP), Rental Power Plants, Public Power Plants, and imports from India. As indicated in Table 2, BPDB has witnessed an 18.8% increase in its own generation costs, a substantial 77.4% increase in energy procurement from IPPs, and a modest 1.4% uptick in energy acquisition from Public Power Plants. The notable increase in generation costs from IPPs stands out as a primary factor contributing to the overall rise in average generation costs.

## 2.5 Capacity payment and subsidy

The capacity charge represents the payment made by the Bangladesh Power Development Board (BPDB) to power plants in exchange for the right to utilize their power generation capacity. According to current agreements, BPDB is obligated to make these payments to plant owners regardless of whether they use the generated electricity or not. As per the Centre for Policy Dialogue (CPD) report (2023), the capacity payment has seen a substantial increase, rising from BDT 5,600 crore in FY2017-18 to BDT 28,000 crore in FY2022-23 (Figure 16). Notably, the capacity payment for FY2022-23 was 16.7 times higher than that in FY2021-22. In alignment with this trend, there has also been a noteworthy increase in subsidies provided to BPDB, surging from BDT 3,550 crore in FY2017-18 to BDT 32,000 crore in FY2023-24.

Figure 16: Trend of subsidy and capacity payment



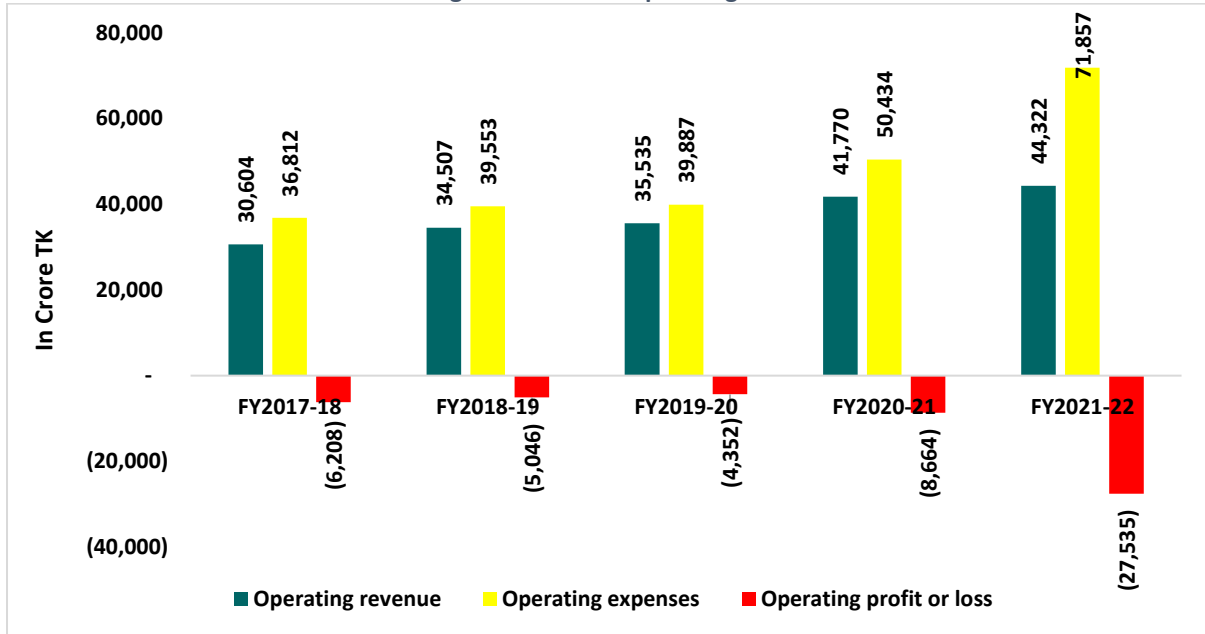
Source: CPD (2023)

## 2.6 BPDB's operating loss

As a result of capacity payments, irregularities, and various inefficiencies, the Bangladesh Power Development Board (BPDB) has accumulated substantial operating losses over the years. BPDB's operating loss has surged from BDT 6,208 crore in FY2017-18 to BDT 27,535 crore in FY2021-22 (Figure 17). Remarkably, the operating loss for FY2021-22 was 217.8% higher than that in FY2020-21.

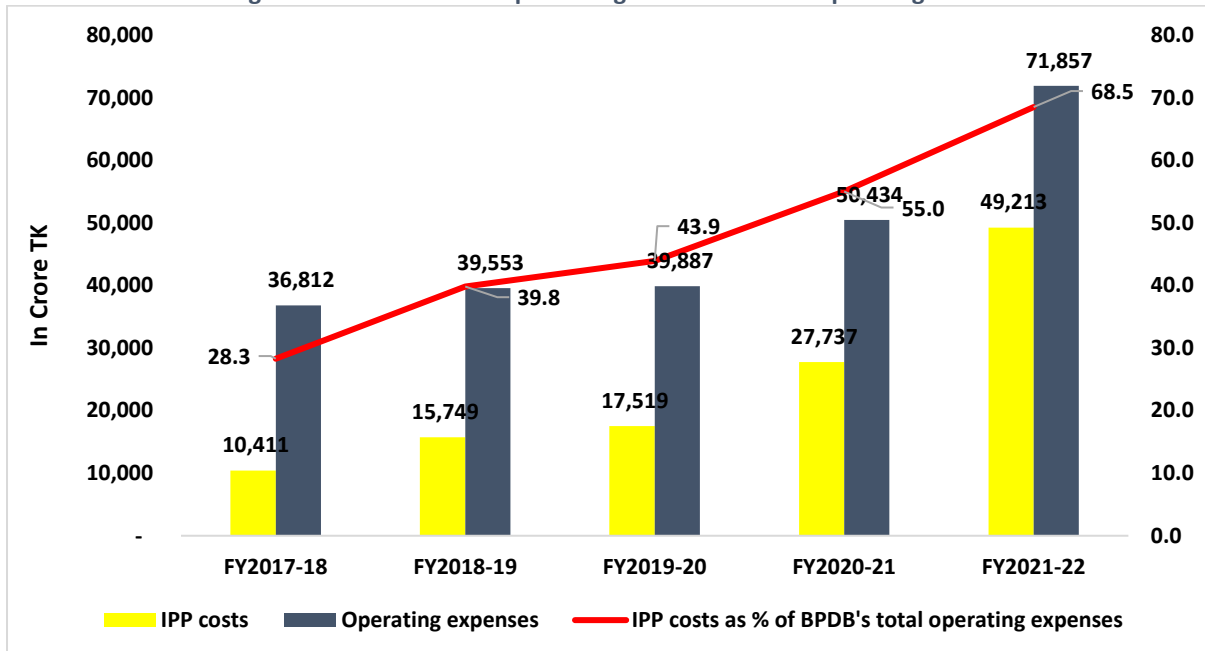
Out of BPDB's overall operating expenses, a significant portion of 68.5% was allocated to procuring electricity from Independent Power Producers (IPPs), as illustrated in Figure 18. Notably, the IPPs' share of costs within BPDB's total operating expenses has climbed from 28.3% in FY2017-18 to 68.5% in FY2021-22. This indicates that the increased expenditure on purchasing electricity from IPPs is the primary factor driving the escalation of BPDB's total operating expenses over time.

Figure 17: BPDB's operating loss



Source: Various Annual Reports, Bangladesh Power Development Board (BPDB)

Figure 18: IPP's costs as a percentage of BPDB's total operating costs



Source: Various Annual Reports, Bangladesh Power Development Board (BPDB)

## 2.7 BPDB's costs of energy import

BPDB's energy imports have seen a rise, increasing from 11,024 megawatt-hours (MkWh) in FY2016-17 to 13,014 MkWh in FY2021-22 (Table 3). Correspondingly, the expenses associated with energy imports have also gone up. While there was a marginal decrease in FY2019-20, costs sharply rose in FY2020-21. In FY2021-22, the cost of energy imports experienced a modest 1.4% increase, and it is expected to continue increasing in the upcoming fiscal years.



**Table 3: BPDB's cost of energy import**

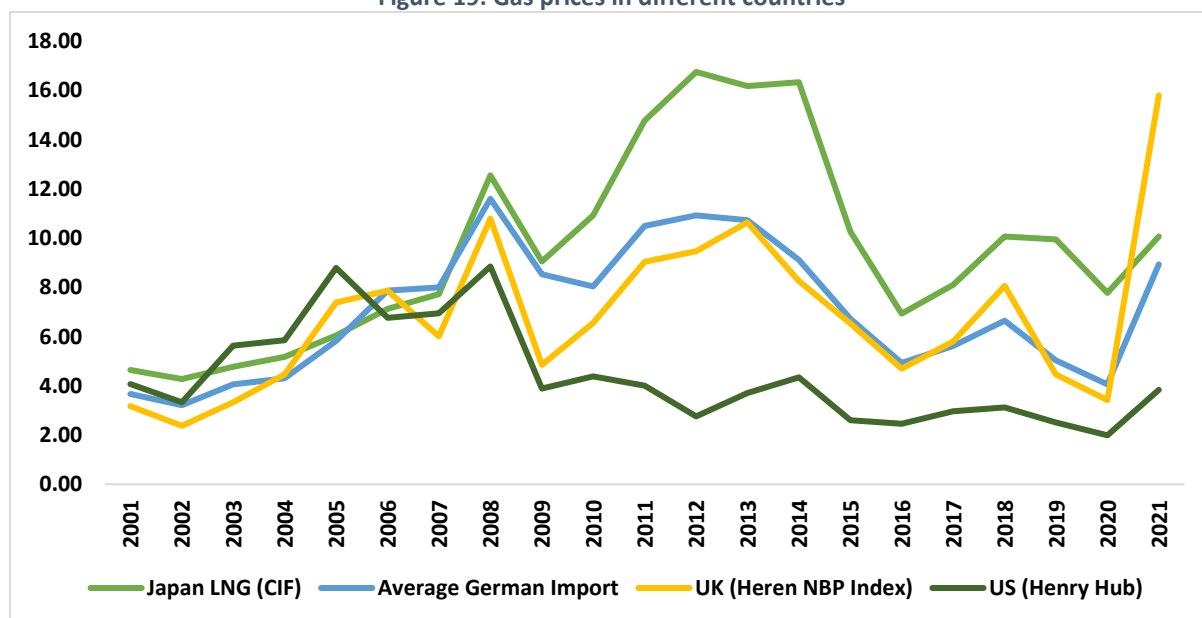
Fiscal Year	Energy import (MkWh)	% change	Cost of energy import (BDT crore)	% change
2016-17	11,024		5,896	
2017-18	10,537	-4.4	5,724	-2.9
2018-19	11,400	8.2	6,413	12.0
2019-20	11,120	-2.5	6,317	-1.5
2020-21	12,309	10.7	7,603	20.4
2021-22	13,014	5.7	7,712	1.4

Source: Various Annual Reports, Bangladesh Power Development Board (BPDB)

## 2.8 LNG scenarios

In line with the global shift away from coal-fired power plants, the government of Bangladesh made the decision to cancel ten coal-fired power plant projects in 2021 (Daily Star, 2021). Some of these cancelled projects were intended to be replaced with LNG-based power plants. Furthermore, to address the challenge of gas supply shortages, Bangladesh is planning to increasingly rely on LNG imports. However, it's important to note that the LNG import price is subject to greater volatility (Figure 19) (Maxwell & Zhu, 2011; Medlock, 2010; Tang & Aruga, 2020; Norouzi, 2021) and the associated import costs are considerably higher (Zubayer & Ahmed, 2023). According to estimates from Petrobangla, the LNG import cost is approximately 40 times that of national company production and 17 times that of IOC production. Demand driven by post-COVID economic recovery across the world, and the supply-side disruptions caused by the Russia-Ukraine War have further exacerbated the pressure on global LNG import prices.

**Figure 19: Gas prices in different countries**



Source: bp Statistical Review of World Energy (2022)

Between 2018 and 2022, Bangladesh imported a total of 16.21 million metric tons of LNG from suppliers such as Qatargas, OQT, and the Spot Market (Table 4). In 2021, the country temporarily abstained from purchasing LNG from the spot market due to elevated prices but later resumed spot LNG purchases from January 2022 (Nicholas, 2022). It's worth noting that to leverage the volatile nature of the spot market, Qatargas and Oman Trading International

can adjust their deliveries to Bangladesh without breaching their contract terms. This analysis underlines the risks associated (Ahmed & Ahad, 2023) with relying heavily on LNG as an energy source.

**Table 4: LNG import from Qatargas, OQT, and Spot Market (2018-2022)**

Fiscal Year	LNG Import											
	Qatar Gas (24 April 2018 to 30 June 2022)			OQ trading lid (OQT) (31 January 2019 to 30 June 2022)			Spot (25 September 2020 to 30 June 2022)			Total		
	Cargo	Million Cubic Meter	Million Metric Ton	Cargo	Million Cubic Meter	Million Metric Ton	Cargo	Million Cubic Meter	Million Metric Ton	Cargo	Million Cubic Meter	Million Metric Ton
2018-19	33	4.58	2.02	08	1.15	0.51				41	5.73	2.53
2019-20	37	5.17	2.27	29	4.28	1.89				66	9.45	4.16
2020-21	40	5.59	2.46	21	2.97	1.298	11	1.59	0.699	72	10.15	4.46
2021-22	44	6.15	2.71	20	2.80	1.22	18	2.57	1.127	82	11.52	5.06
Total	154	21.49	9.46	78	11.20	4.92	29	4.16	1.826	261	36.85	16.21

Source: Rupantarita Praktik Gas Company Limited (RPGCL)

**Table 5: Projects to be commissioned during 2022-2027**

SI No.	Name of the Powerplant	Capacity (MW)	Ownership	Type of Fuel	Expected Commissioning date
Public Sector					
1.	Rupsa 800 MW CCPP; Unit- 1	440	NWPGCL	LNG	October 2023
2.	Rupsa 800 MW CCPP; Unit- 2	440	NWPGCL	LNG	April 2024
3.	Haripur 250 MW CCPP	243	BPDB	LNG	December 2025
4.	Raojan 400± 10% MW CCPP	400	BPDB	LNG	December 2025
5.	Ghorashal 225 MW CCPP	225	BPDB	LNG	June 2026
6.	Payra 1200 MW LNG-based CCPP (1 <sup>st</sup> Phase)	1,200	NWPGCL	LNG	June 2026
7.	Shiddhirgonj 400± 10% MW CCPP	550	BPDB	LNG	June 2027
8.	Gazaria 600MW LNG Based Power Plant	660	RPCL	LNG	June 2027
Sub Total			4158		
Joined Venture					
1.	LNG-based 1200 MW CCPP at Moheshkhali Phase- 1	1,164	BPDB	LNG	June 2027
Sub Total			1164		
Private Sector					
1.	Meghnaghat 583 MW CCPP (Summit Unit- 2)	583	IPP	LNG/HSD	March 2023
2.	Meghnaghat 600 MW CCPP (Unique)	584	IPP	LNG	March 2023
3.	Meghnaghat 750 MW CCPP (Reliance)	718	IPP	LNG	March 2023
4.	Anowara 590 MW CCPPC (United)	590	IPP	LNG	January 2026
5.	Meghnaghat 500 MW CCPP (Unlima)	450	IPP	LNG	January 2026
6.	Gozaria 600 MW CCPP (IDRA)	660	IPP	LNG	December 2026
7.	Mirsorai 660 MW CCPP (Confidence)	660	IPP	LNG	June 2027
Sub Total			4,245		
Total			9,567		

Source: Rupantarita Praktik Gas Company Limited (RPGCL)

Despite the potential risks associated with depending on LNG, the country is set to increase its reliance on LNG imports. The projects scheduled for commissioning between 2022 and 2027 highlight the nation's significant dependence on LNG imports in the upcoming years (Table 5).

## 2.9 Renewable energy

To promote renewable and clean energy alongside fossil fuel, the PSMP 2016 attached considerable importance to the utilization of renewable energy resources. The GoB has already established the 'Sustainable and Renewable Energy Development Authority (SREDA)' in 2014 under the Sustainable and Renewable Energy Development Authority Act, 2012 to facilitate sustainable energy/renewable energy as well as energy efficiency. So far, a 1,158.1 MW renewable energy system has been installed (Figure 6). It is only 4.93% of the total grid-based power generation capacity in FY2022-23. The country has formulated 'Net Metering Guideline, 2018 to promote the rooftop solar system in the country. This guideline encourages consumers to become *prosumers* by the utilization of free space in their buildings for solar power generation. So far, 1,821 systems under the Net Metering Scheme with a total capacity of 60.034 MW and 2,777 solar irrigation systems with a total capacity of 51.076 MW have been installed (BER, 2023).

**Table 6: The progress of renewable energy in FY2022-23**

Technology	Off-grid (MW)	On-grid (MW)	Total (MW)
Solar	356.7	567.8	924.5
Wind	2.0	0.9	2.9
Hydro		230.0	230.0
Biogas	0.7	0.0	0.7
Biomass	0.4	0.0	0.4
Total	359.4	798.7	1158.1

Source: Power Division

Based on the analysis of the power and energy sector, it is evident that several significant challenges are currently confronting the sector. These challenges include optimizing the utilization of power plant capacity, reducing system losses, lowering electricity procurement costs from Independent Power Producers (IPPs), adjusting capacity payments and subsidies, trimming operating costs for the Bangladesh Power Development Board (BPDB), lessening the heavy reliance on fuel imports, and increasing the share of renewable energy (RE) in power generation. These challenges pose a substantial risk to the sustainability of the sector. To ensure the sustainable development of the sector, the national budget for FY2023-24 must duly recognize these challenges. It should also incorporate a comprehensive plan, spanning short, medium, and long-term strategies, aimed at effectively addressing these issues.

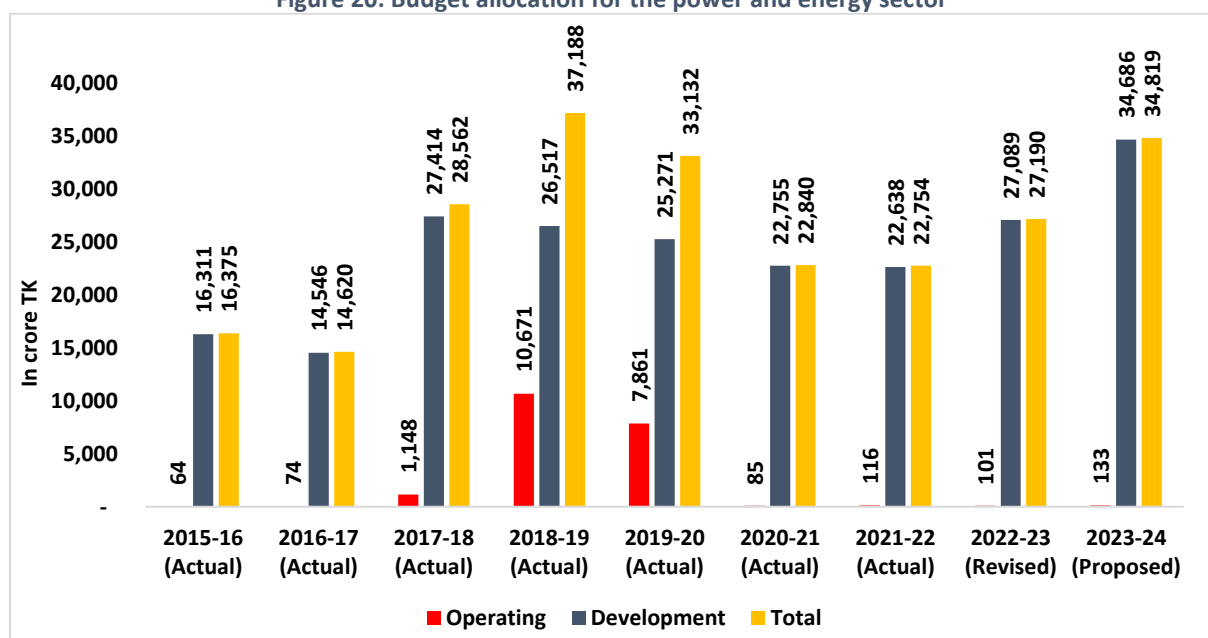
### 3. An analysis of the power and energy sector in the FY2023-24 national budget

This section mainly highlights the allocation for the power and energy sector in the national budget for FY2023-24. It also provides a comparison with the allocations during the Seventh Five-Year Plan (7FYP) from FY2015-16 to FY2019-20 and the progress made in the Eighth Five-Year Plan (8FYP) from FY2020-21 to FY2022-23. The National Parliament of Bangladesh has officially approved a national budget for FY2023-24, amounting to BDT 7,61,785 crore. Out of this total budget, an allocation of BDT 34,819 crore has been designated for the power and energy sector.

#### 3.1 Budget allocation in the power and energy sector

The Ministry of Power, Energy and Mineral Resources (MoPEMR) holds the specific responsibility for overseeing Bangladesh's power and energy sector. Figure 20 provides a breakdown of the budget allocations for operating, development, and the overall budget of the power and energy sector. In FY2023-24, the allocation for MoPEMR amounted to BDT 34,819 crore. This figure represents a 28.1% increase when compared to the allocation in FY2022-23. Within this increase, the operating budget saw a rise of 31.7%, while the development budget increased by 28.0%. The overall budget increase for FY2023-24 in the power and energy sector can be attributed to significant boosts in both the operating and development budgets.

Figure 20: Budget allocation for the power and energy sector



Source: Finance Division, Ministry of Finance

There was a significant surge in operating expenditures for FY2018-19 and FY2019-20, which can be attributed to several factors (Table 7). Firstly, the increased capacity payment necessitated the entire government subsidy to be channelled towards meeting the obligations of the Bangladesh Power Development Board (BPDB) in this regard. Secondly, a substantial portion of BPDB's expenses was tied to procuring electricity from independent power producers and short-term rental power plants. Another notable expense was the

purchase of coal, leading to heightened financial burdens due to the substantial importation of fossil fuels during those years. Furthermore, the costs associated with petroleum imports experienced a dramatic rise during that period (Moazzem and Shibly, 2020).

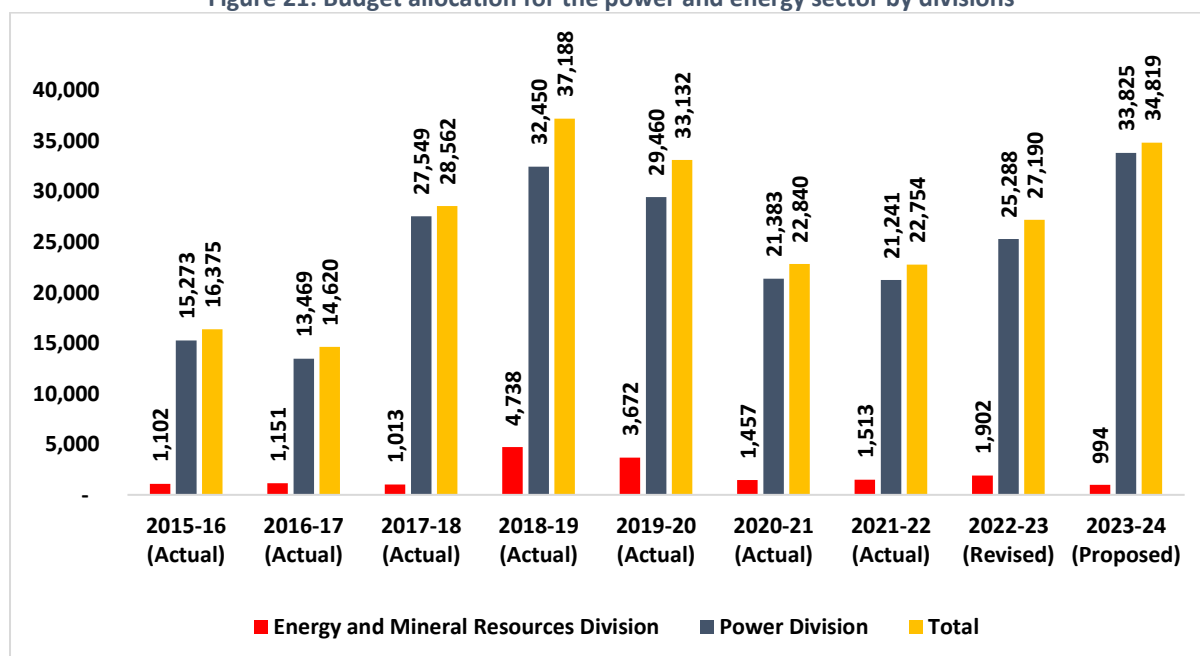
However, it's noteworthy that the operating budget exhibited negative growth from FY2019-20 to FY2020-21, followed by a remarkable 36.5% positive growth in FY2021-22 before witnessing a negative growth of 12.9% in FY2022-23. In contrast, the development budget showed negative growth from FY2018-19 to FY2021-22 but rebounded with a positive growth of 19.7% in FY2022-23. The total budget of the Ministry of Power, Energy and Mineral Resources (MoPEMR) experienced negative growth in the final year of the 7FYP and continued into FY2021-22. Nevertheless, it saw a significant upswing with a robust positive growth of 19.5% in FY2022-23.

**Table 7: Change in budget allocation (%)**

	2016-17 (Actual)	2017-18 (Actual)	2018-19 (Actual)	2019-20 (Actual)	2020-21 (Actual)	2021-22 (Actual)	2022-23 (Revised)	2023-24 (Proposed)
Operating	15.6	<b>1451.4</b>	<b>829.5</b>	-26.3	-98.9	36.5	-12.9	31.7
Development	-10.8	88.5	<b>-3.3</b>	<b>-4.7</b>	<b>-10.0</b>	<b>-0.5</b>	19.7	28.0
Total	-10.7	95.4	30.2	<b>-10.9</b>	<b>-31.1</b>	<b>-0.4</b>	19.5	28.1

Source: Finance Division, Ministry of Finance

**Figure 21: Budget allocation for the power and energy sector by divisions**



Source: Finance Division, Ministry of Finance

The Ministry of Power, Energy and Mineral Resources (MoPEMR) is comprised of two divisions: the Energy and Mineral Resources Division (EMRD) and the Power Division (PD). To gain insights into the country's relative dependence on power and energy, we conducted a detailed analysis by dividing our focus across these divisions. While the overall budget of MoPEMR experienced a notable increase of 28.1% in FY2023-24, the budget for the EMRD saw a significant decrease of 47.7% (Figure 21). In contrast, the budget allocated to the PD

surged by 33.8% in FY2023-24. This suggests that the expansion of the MoPEMR budget for FY2023-24 can be primarily attributed to the substantial increase in the PD budget.

**Table 8: Change in budget allocation by divisions (%)**

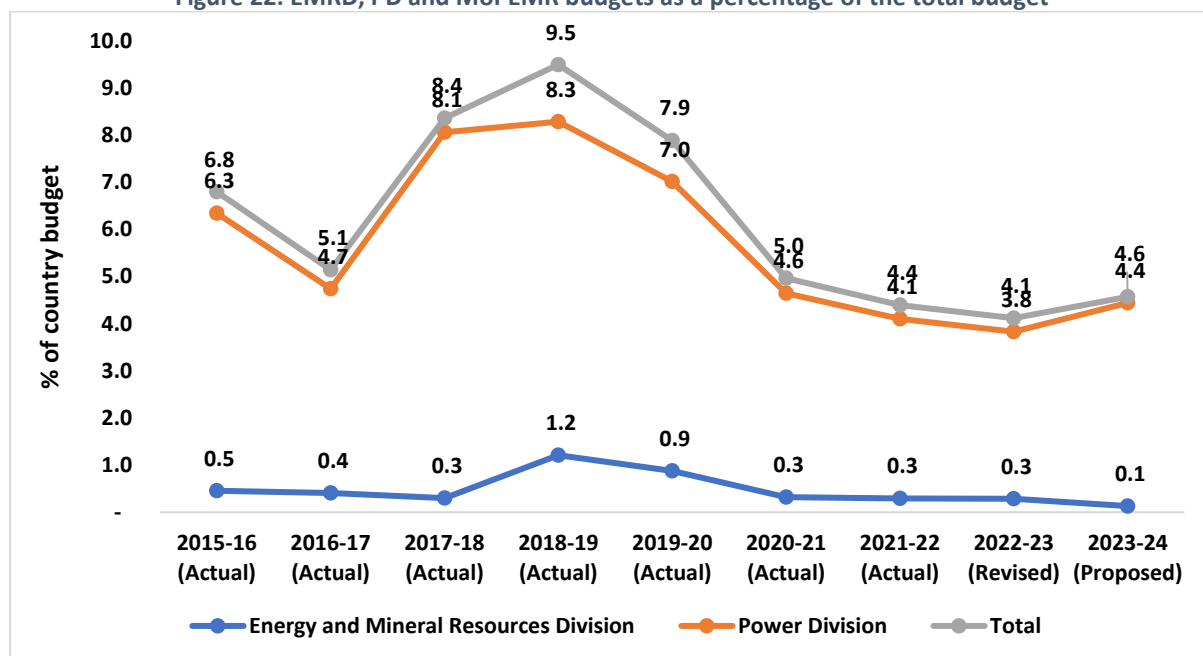
	2016-17 (Actual)	2017-18 (Actual)	2018-19 (Actual)	2019-20 (Actual)	2020-21 (Actual)	2021-22 (Actual)	2022-23 (Revised)	2023-24 (Proposed)
Energy and Mineral Resources Division	4.4	-12.0	367.7	-22.5	-60.3	3.8	25.7	-47.7
Power Division	-11.8	104.5	17.8	-9.2	-27.4	-0.7	19.1	33.8
Total	-10.7	95.4	30.2	-10.9	-31.1	-0.4	19.5	28.1

Source: Finance Division, Ministry of Finance

The budget allocated to the Energy and Mineral Resources Division (EMRD) exhibited a remarkable 367.7% positive growth in FY2018-19 but then experienced negative growth rates of 22.5% and 60.3% in the subsequent FY2019-20 and FY2020-21 (Table 8). Following this, there were modest positive growth rates of 3.8% and 25.7% in FY2021-22 and FY2022-23, respectively, before witnessing a substantial negative growth of 47.7% in FY2023-24.

Conversely, the budget allocated to the Power Division (PD) witnessed significant growth, with an increase of 104.5% and 17.8% in FY2017-18 and FY2018-19, respectively. However, it subsequently experienced negative growth from FY2019-20 to FY2021-22. In more recent years, it rebounded with a positive growth rate of 19.1% in FY2022-23, followed by a notable 33.8% positive growth in FY2023-24.

**Figure 22: EMRD, PD and MoPEMR budgets as a percentage of the total budget**

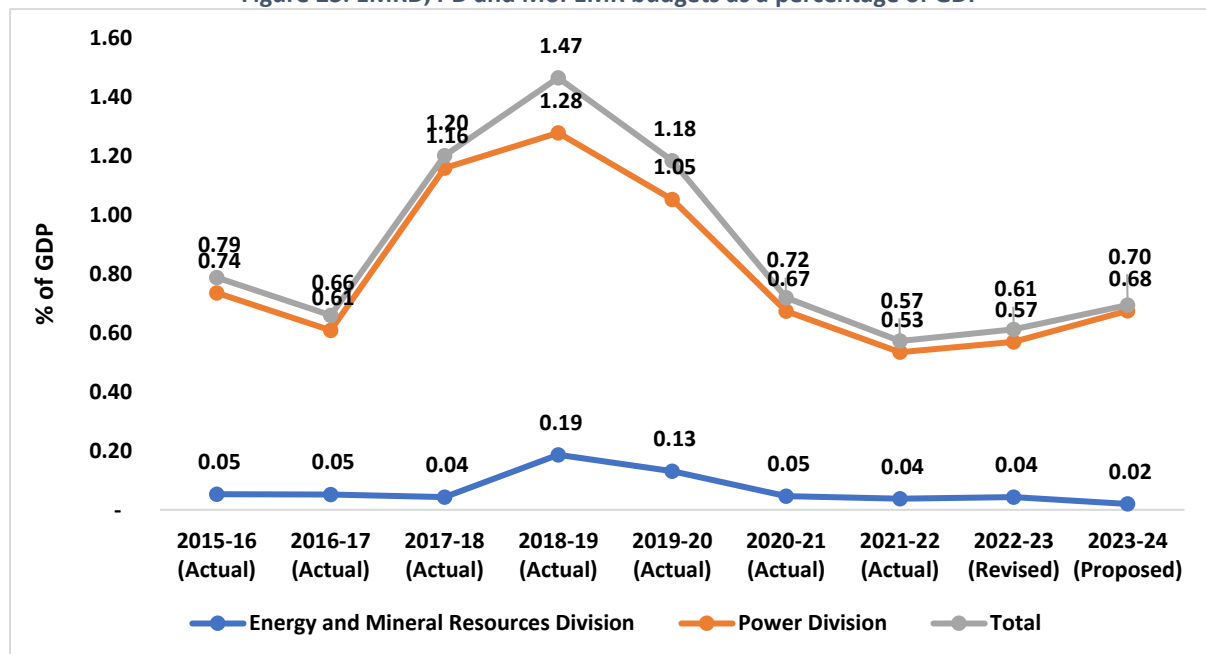


Source: Finance Division, Ministry of Finance

We have observed that, in absolute terms, the overall budget of the Ministry of Power, Energy and Mineral Resources (MoPEMR) increased between FY2020-21 and FY2023-24. However, to gauge the relative significance of the power and energy sector within the context of the country's ambitious goals for the coming years, it is essential to assess whether the MoPEMR budget increased in comparison with the overall national budget and GDP.

Figure 22 illustrates the budgets of the Energy and Mineral Resources Division (EMRD), Power Division (PD), and MoPEMR as percentages of the total country budget. It becomes evident that these budgets as a percentage of the total budget have been on a declining trend since FY2018-19. For instance, the EMRD budget constituted 1.2% of the total national budget in FY2018-19 but has dwindled to a mere 0.1% in FY2023-24. Similarly, the PD budget contracted from 8.3% of the total budget in FY2018-19 to 4.4% in FY2023-24. The budget of MoPEMR, as a percentage of the total budget, has also declined, slipping to 4.6% in FY2023-24 from its peak of 9.5% in FY2018-19.

Figure 23: EMRD, PD and MoPEMR budgets as a percentage of GDP



Source: Finance Division, Ministry of Finance

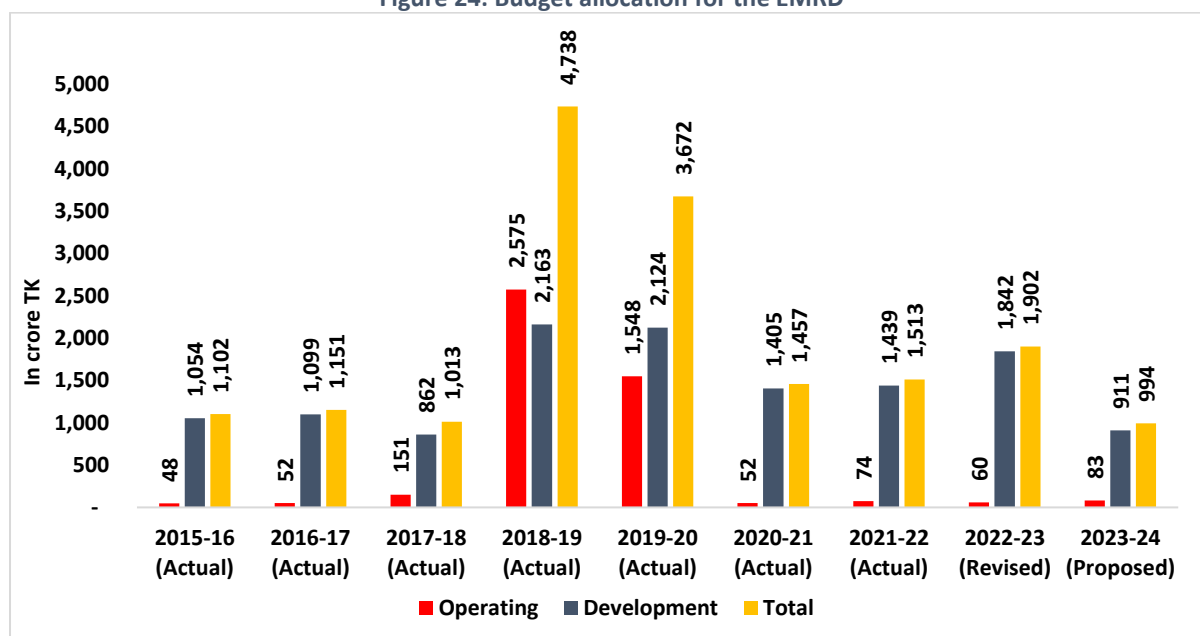
Figure 23 provides a perspective on the budgets of the Energy and Mineral Resources Division (EMRD), Power Division (PD), and the Ministry of Power, Energy and Mineral Resources (MoPEMR) as percentages of the Gross Domestic Product (GDP). When assessed in terms of GDP, these budgets have demonstrated a decreasing trend since FY2018-19.

Specifically, the MoPEMR budget has contracted to 0.70% of the country's GDP in FY2023-24, down from 1.47% in FY2018-19. Similarly, the budgets of the EMRD and PD have seen reductions, declining to 0.02% and 0.68% in FY2023-24, respectively, from 0.19% and 1.28% in FY2018-19, respectively.

### 3.2 Budgetary allocation in the energy sector

The Energy and Mineral Resources Division (EMRD), housed within the Ministry of Power, Energy and Mineral Resources (MoPEMR), bears the responsibility for overseeing Bangladesh's energy sector. Therefore, a comprehensive analysis of the EMRD budget can offer valuable insights into the development of the country's energy sector.

Figure 24: Budget allocation for the EMRD



Source: Finance Division, Ministry of Finance

In FY2023-24, the allocation for EMRD amounted to BDT 994 crore, as depicted in Figure 24. This figure represents a notable decrease of 47.7% when compared to the allocation in FY2022-23. Despite this decrease, the operating budget witnessed an increase of 38.3%, while the development budget experienced a substantial decline of 50.5%. However, it is important to note that the overall budget of EMRD decreased primarily due to the reduction in the development budget. This decline raises concerns regarding the prospects for the development of the country's energy sector.

Table 9: Change in EMRD budget allocation (%)

	2016-17 (Actual)	2017-18 (Actual)	2018-19 (Actual)	2019-20 (Actual)	2020-21 (Actual)	2021-22 (Actual)	2022-23 (Revised)	2023-24 (Proposed)
Operating	8.3	190.4	1605.3	-39.9	-96.6	42.3	-18.9	38.3
Development	4.3	-21.6	150.9	-1.8	-33.9	2.4	28.0	-50.5
Total	4.4	-12.0	367.7	-22.5	-60.3	3.8	25.7	-47.7

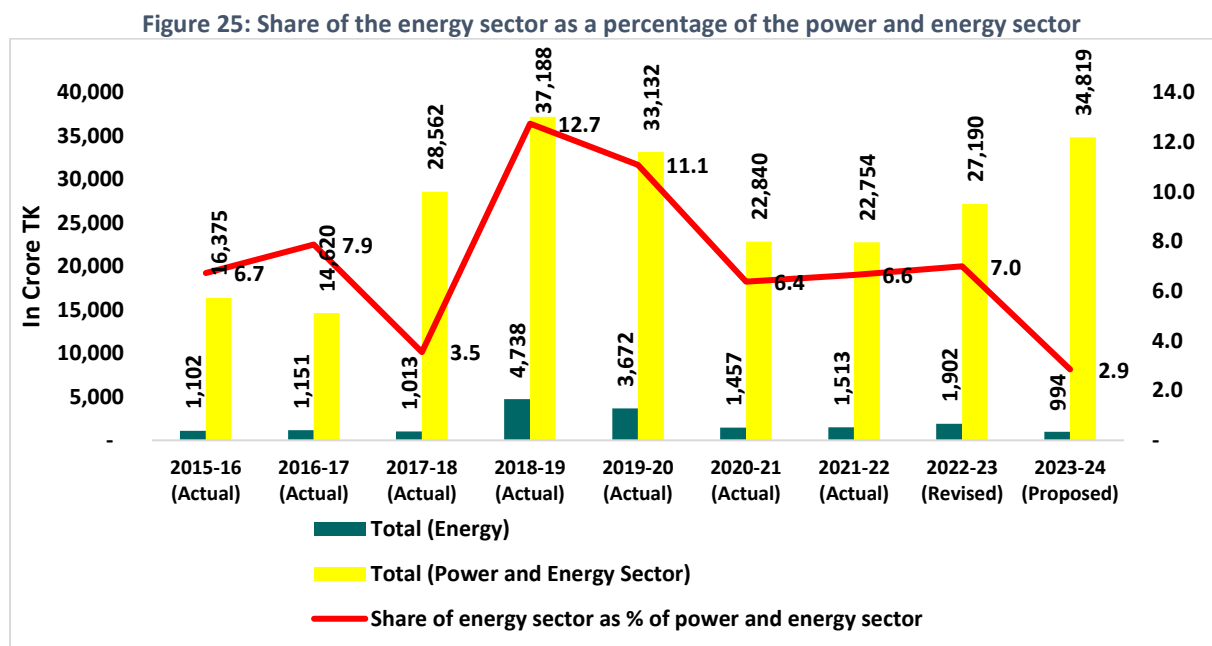
Source: Finance Division, Ministry of Finance

The operating budget of the Energy and Mineral Resources Division (EMRD) saw a substantial increase, surging to 1605.3% in FY2018-19 from 8.3% in FY2016-17 (Table 9). However, it encountered a period of negative growth between FY2019-20 and FY2020-21. Following this, it experienced a noteworthy positive growth of 42.3% in FY2021-22, only to witness a subsequent negative growth of 18.9% in FY2022-23.

In contrast, the development budget of EMRD witnessed a significant leap, reaching a peak growth rate of 150.9% in FY2018-19 before undergoing a phase of negative growth between FY2019-20 and FY2020-21. However, it rebounded with positive growth between FY2021-22 and FY2022-23, only to observe considerable negative growth in FY2023-24.

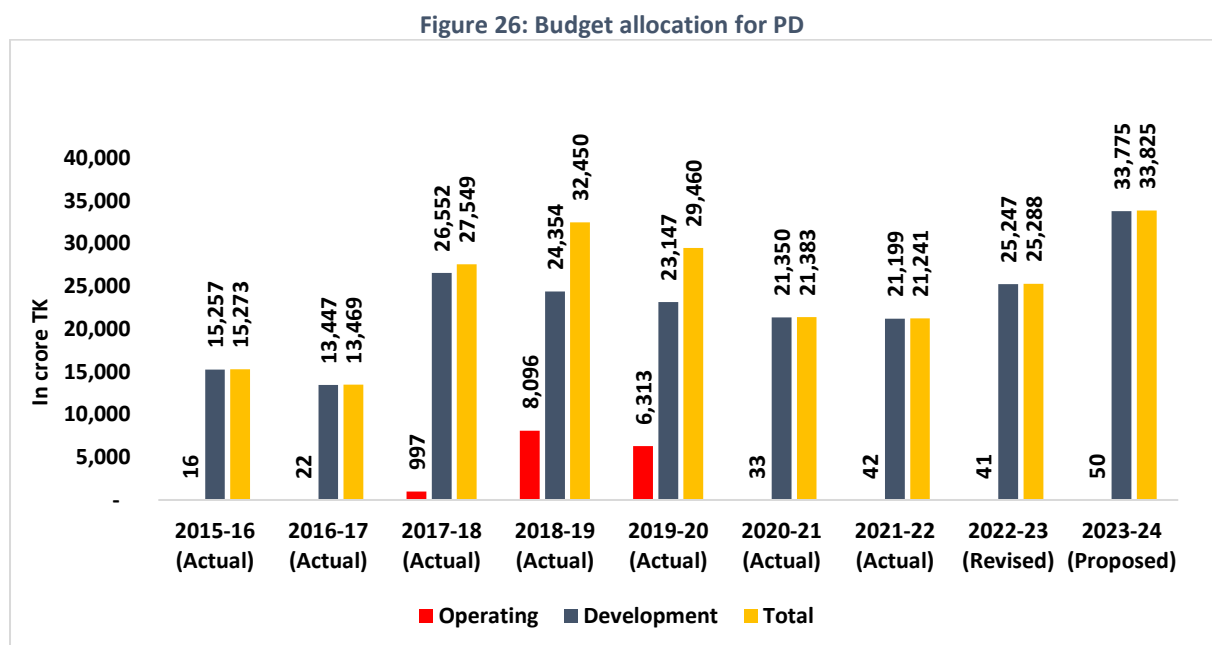


Figure 25 illustrates the proportion of the energy sector within the broader power and energy sector. Our analysis reveals that the share of the energy sector, as a percentage of the power and energy sector, has been on a declining trend since FY2018-19. It has diminished to 2.9% in FY2023-24, down from its peak of 12.7% in FY2018-19.



Source: Finance Division, Ministry of Finance

### 3.3 Budget allocation in the power sector



Source: Finance Division, Ministry of Finance

The allocation for the PD budget amounted to BDT 33,825 crore in FY2023-24 (Figure 26). It is 33.8% higher compared to that of FY2022-23, among which the operating budget increased by 22.0% and the development budget by 33.8%.

**Table 10: Change in PD budget allocation (%)**

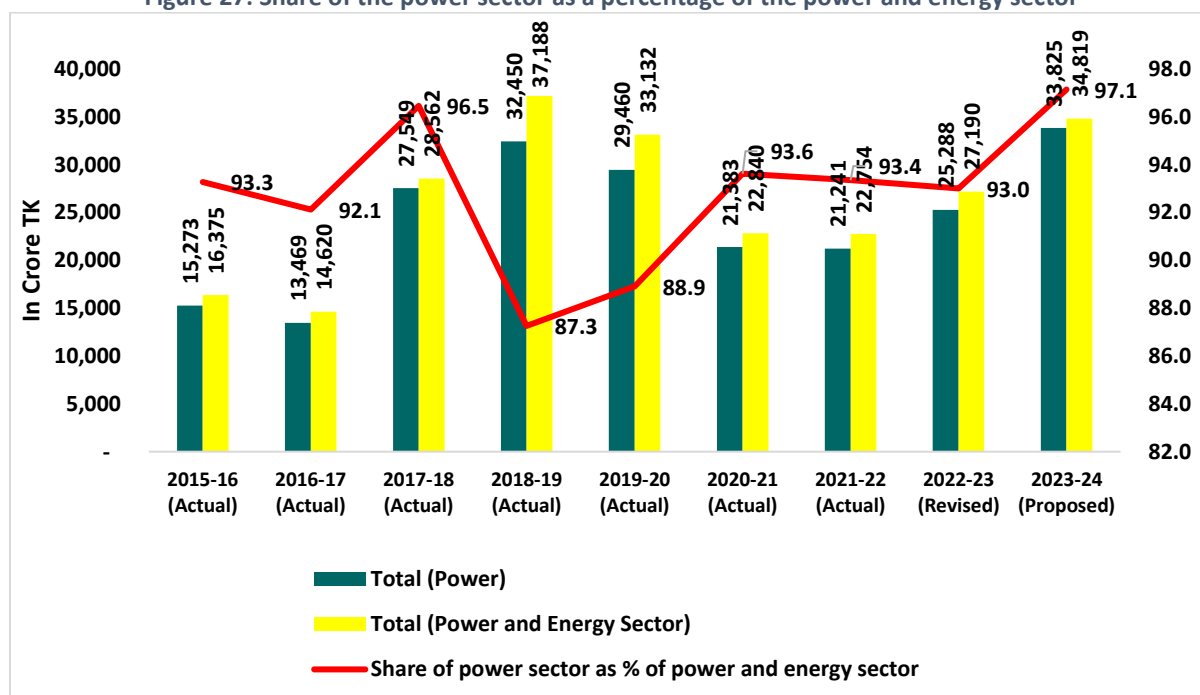
	2016-17 (Actual)	2017-18 (Actual)	2018-19 (Actual)	2019-20 (Actual)	2020-21 (Actual)	2021-22 (Actual)	2022-23 (Revised)	2023-24 (Proposed)
Operating	37.5	4431.8	712.0	-22.0	-99.5	27.3	-2.4	22.0
Development	-11.9	97.5	-8.3	-5.0	-7.8	-0.7	19.1	33.8
Total	-11.8	104.5	17.8	-9.2	-27.4	-0.7	19.1	33.8

Source: Finance Division, Ministry of Finance

The operating budget of the Power Division (PD) demonstrated positive growth from FY2016-17 to FY2018-19 before encountering a period of negative growth between FY2019-20 and FY2020-21 (Table 10). It then surged with a substantial positive growth rate of 27.3% in FY2021-22 but saw a subsequent negative growth of 2.4% in FY2022-23.

In contrast, with the exception of FY2017-18, the development budget of PD experienced negative growth from FY2016-17 to FY2021-22. However, it recorded a positive growth of 19.1% in FY2022-23.

**Figure 27: Share of the power sector as a percentage of the power and energy sector**



Source: Finance Division, Ministry of Finance

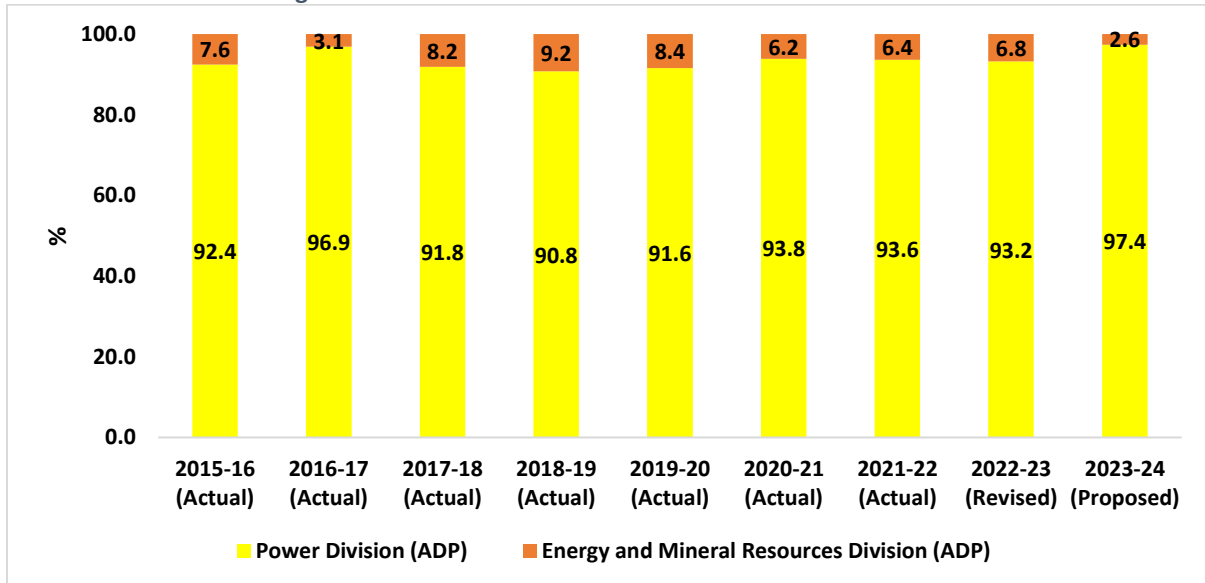
Figure 27 depicts the portion of the power sector within the broader power and energy sector. Our analysis reveals that the share of the power sector, as a percentage of the power and energy sector, has been on an upward trajectory since FY2018-19. It has risen to 97.1% in FY2023-24, up from 87.3% in FY2018-19.

### 3.4 ADP allocation in the power and energy sector

In the preceding sections, we focused on the development budget, which is actually the Annual Development Programme (ADP). In this specific sub-section, our aim is to discuss the share of the ADP allocation within the ADP of the Ministry of Power, Energy and Mineral

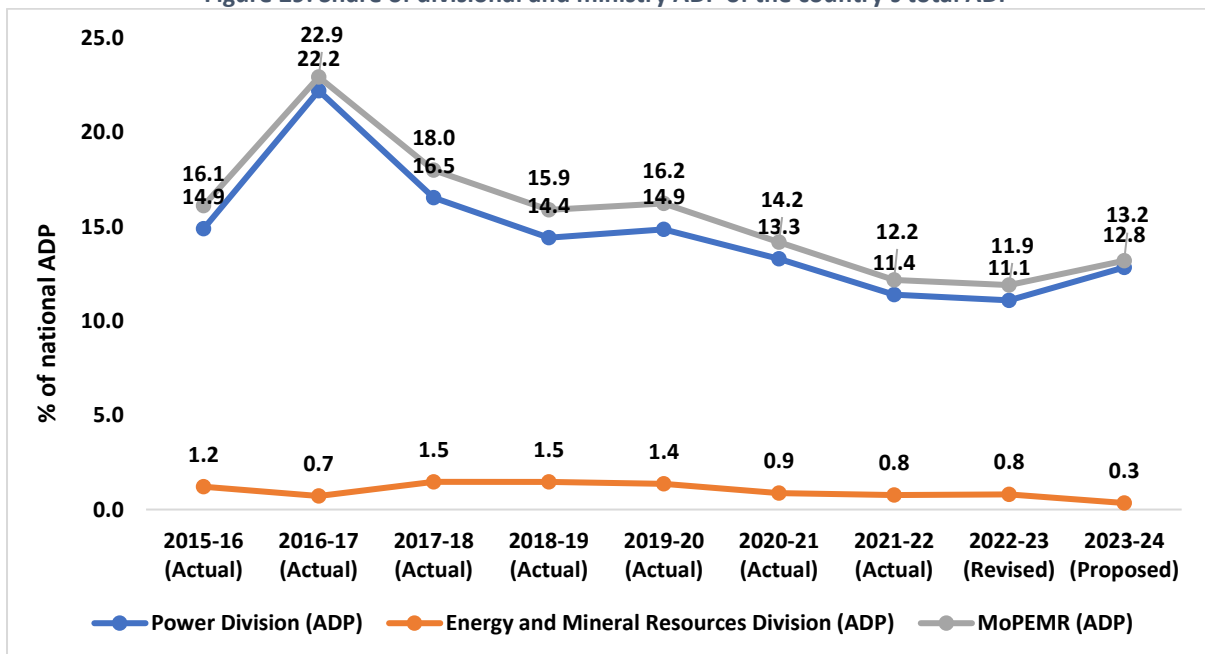
Resources (MoPEMR), and the proportion of the divisional and ministry ADP in the total national ADP. Our observations reveal that, over time, the share of the ADP within the Power Division (PD) has seen an increase, while the share of the ADP within the Energy and Mineral Resources Division (EMRD) has witnessed a decrease (Figure 28).

Figure 28: Share of divisional ADP of the total MoPEMR ADP



Source: Finance Division, Ministry of Finance

Figure 29: Share of divisional and ministry ADP of the country's total ADP



Source: Finance Division, Ministry of Finance

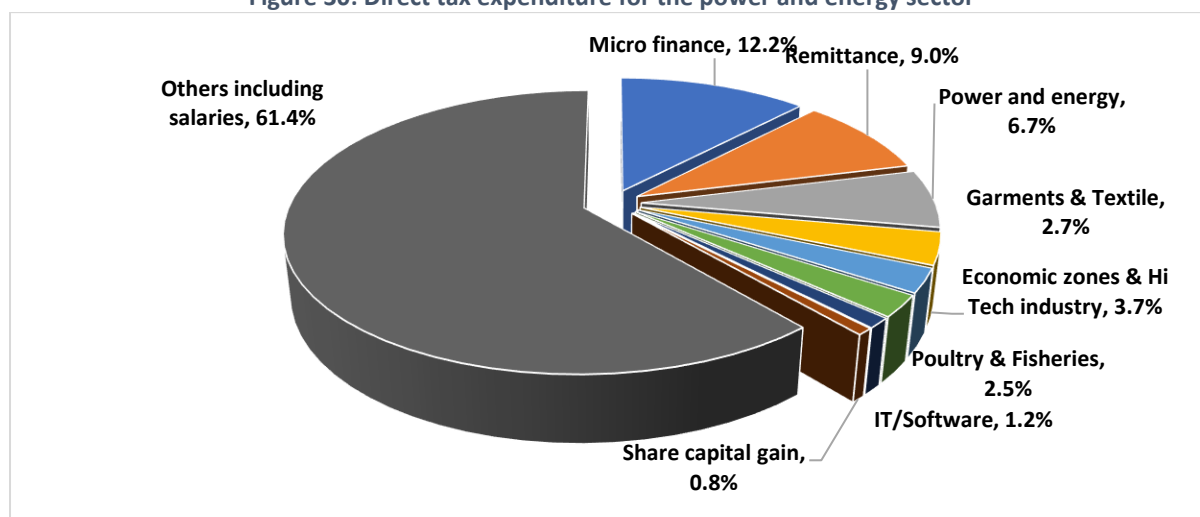
Figure 29 provides an overview of the divisional and ministry Annual Development Programme (ADP) shares within the total national ADP. Notably, the share of the ministry's ADP declined to 13.2% in FY2023-24, down from 22.9% in FY2016-17. Similarly, the share of the Power Division (PD) ADP and the Energy and Mineral Resources Division (EMRD) ADP

decreased to 12.8% and 0.3% in FY2023-24, respectively, from 22.2% and 0.7% in FY2016-17, respectively.

### 3.5 Direct tax expenditure for the power and energy sector

"Direct Tax Expenditure" refers to various forms of tax incentives such as rebates, discounts, exemptions, reduced tax rates, and the exclusion of income from the calculation of total taxable income. Essentially, it represents a form of tax subsidy. In other words, if this subsidy were treated as tax revenue, it would be added to the overall tax collections, resulting in an increase in the total tax amount collected.

Figure 30: Direct tax expenditure for the power and energy sector



Source: Budget in Brief, Finance Division, Ministry of Finance

The Income Tax Department of the National Board of Revenue has, for the first time in Bangladesh, made an estimation of "Direct Tax Expenditure" by analyzing on-the-ground factual data. The estimated direct tax expenditure stands at BDT 1,78,241 crore. Within this direct tax expenditure, the power and energy sector constitutes 6.7%, as illustrated in Figure 30. This indicates that the power and energy sector receives substantial subsidies, reflecting a high level of support.

Based on a comprehensive analysis of the power and energy sector budget, several key observations can be made. Firstly, in terms of the country's overall budget and GDP, the budget allocated to the Ministry of Power, Energy and Mineral Resources (MoPEMR) has seen a consistent decline over the years. Similarly, we have noted a decrease in the Annual Development Programme (ADP) allocation for the power and energy sector. This trend contradicts the ambitious targets set for 2030, 2041, and 2050, revealing a disconnect between budget allocations and these ambitious goals.

Secondly, when examining the budget figures in absolute terms, it becomes apparent that the budget for the Energy and Mineral Resources Division (EMRD) has decreased, while the budget for the Power Division (PD) has increased in recent years. This suggests that the government has placed greater emphasis on short-term import-based power generation rather than investing more in domestic exploration efforts. This declining trend in the energy

sector budget, coupled with the ever-expanding power generation targets, highlights the heavy reliance on power sector imports and the associated vulnerabilities.

Lastly, there appear to be no discernible growth patterns in the budgets of EMRD, PD, and MoPEMR during the 7th Five-Year Plan (7FYP) and 8th Five-Year Plan (8FYP). These findings indicate a lack of specific plans or strategies by the government to foster sustainable growth in alignment with its ambitious objectives for the sector.

#### **4. Renewable energy in the FY2023-24 national budget**

Renewable energy has not been given the necessary priority in the proposed FY2023-24 budget. In the budget speech, it was mentioned that the government has a target of using renewable energy at 10% of the total electricity by 2030. The government also wants to generate 40% of total electricity production from clean energy by 2041. The progress of the renewable energy sector was also mentioned in the budget speech. For instance, electricity facilities are being provided to the people living in off-grid areas by installing 60 lakh solar systems. Eight solar parks have been built across the nation. To cut carbon emissions, diesel-powered pumps are being replaced by solar-powered ones. With a total 90-unit capacity of 49.16 megawatts, 2,570 pumps have already been installed. At present, a total of 894 megawatts of electricity is being generated from renewable energy. However, the country has a renewable energy-based power installed capacity of only 1194 megawatts.

Among the projects in ADP under the power and energy sector, only 5 projects are RE-based. In the ADP budget 2023-24, there are some specific allocations in the renewable energy sector. The project for solar pump photovoltaic agriculture irrigation got the allocation of BDT 183.8 crore taka in FY2023-24 where the allocation was BDT 119.1 crore in the actual budget of FY2022-23. For the construction of 10 megawatt solar plant at Madarganj in Jamalpur district, BDT 715.8 crore is allotted for the FY2023-24. In the previous fiscal year, the allotment in this project was BDT 77.8 crore. For the construction of Sonagazi 50 megawatts solar power plant, BDT 16.5 crore is allotted. The allotment was BDT 495 crore in FY2022-23 (Actual). BDT 45.0 crore is allotted for Hatia Island, Nijhum Island, and Kutubdia Island 100% reliable and sustainable electrification where BDT 110.7 crore was allotted in FY2022-23 (Actual). For irrigation with surface water using renewable energy in the Rangamati expansion project, BDT 2.40 crore is allotted in the ADP budget of FY2023-24. Power supply through the installation of solar panels in remote areas of Chittagong hill tracts (Phase II) and minor irrigation development projects by using solar energy projects got the allocation in the previous fiscal year budget but did not receive any budget in the FY2023-24 budget.

In the current ADP budget, the Sustainable and Renewable Energy Development Authority (SREDA) got an allotment of BDT 14.7 crore for the household energy platform program in Bangladesh. In the previous fiscal year, the allotment of this project was BDT 7.7 crore. SREDA got an allocation of BDT 18.6 crore for financing activities of increasing energy efficiency and preservation of energy projects in FY2022-23 but it did not get any allocation for the current fiscal year. For these two projects, SREDA got an ADP allotment of BDT 14.7 crore in FY2023-24 whereas it was BDT 26.3 crore in FY2022-23. The total allotment of ADP for SREDA has

decreased significantly. Similarly, we have observed that the ADP allocation on RE for FY2023-24 has decreased by 2.5%.

**Table 11: Renewable energy allocation in Annual Development Plan (ADP) budget, FY2023-24**

List of Projects in ADP 2023-24	In crore Taka			Change between FY2022-23 (proposed) and FY2022-23 (Actual)	Change between FY2022-23 (Actual) and FY2023-24 (Proposed)
	FY2022-23 (Proposed)	FY2022-23 (Actual)	FY2023-24 (Proposed)		
Solar pump photovoltaic agriculture irrigation project	269.6	119.1	183.8	-55.8	54.3
Construction of 100 MW solar power plant at Madarganj in Jamalpur district	150.0	77.8	715.8	-48.1	819.6
Construction of Sonagazi 50 MW solar power plant	231.0	495.0	16.5	114.3	-96.7
Hatia Island, Nijhum Island, Kutubadia Island 100% reliable and sustainable electrification	159.0	110.7	45.0	-30.4	-59.4
Irrigation with surface water using renewable energy in Rangamati expansion project	-	-	2.4	-	-
Power supply through installation of solar panels in remote areas of Chittagong hill tracts (Phase II)	80.0	139.8	-	74.8	-
Minor irrigation development project by using solar energy	21.3	22.9	-	7.8	-
<b>Sustainable And Renewable Energy Development Authority (SREDA)</b>	31.4	26.3	14.7	-16.1	-44.4
I. Financing in activities of increasing energy efficiency & preservation of energy	12.7	18.6	-	46.7	-
II. Household energy platform programme in Bangladesh	18.7	7.7	14.7	-58.9	90.5
<b>Total</b>	<b>973.7</b>	<b>1018.1</b>	<b>992.7</b>	<b>4.6</b>	<b>-2.5</b>

*Source: Annual Development Programme (ADP), FY2023-24; Finance Division, Ministry of Finance*

Apart from the exemption of advance import tax on solar desalination plants to produce fresh water, there were no specific fiscal incentives included for renewable energy. Although the government has reiterated its intention to use 40% clean energy by 2041, it appears that the budget does not contain any meaningful incentives for clean energy. It needs to be mentioned that the import of an inverter, a crucial component of solar projects, is subject to a duty of 37% when used in small projects. The import of an aluminium frame for solar projects is subject to a duty of 58.6%, and the import of a walkway, a solar project accessory, is subject to a duty of 15.26%. Lithium-ion battery imports are subject to a tax of almost 89%, solar panel imports are subject to a tariff of over 26%, and UV-resistant DC cable is subject to a tax of almost 59%.<sup>4</sup> Industries and business associations were looking for a significant reduction of import duties on rooftop solar accessories. However, in the budget, we did not see any information on import duties on rooftop solar accessories. It implies that the import duties of renewable accessories remain unchanged.

<sup>4</sup> <https://bangladeshpowerpathways.com/fossil-fuel-dependency-pushes-energy-starved-bangladesh-to-worse-days/>

On the other hand, in response to requests from fossil fuel business owners, the finance minister quickly proposed in the budget to remove the 15% VAT and 5% advance tax on the import of petroleum goods and furnace oil, which might increase earnings for fossil fuel investors. Thus, the budget for FY2023–24 discourages investments in renewable energy sources and promotes the import of liquefied natural gas and domestic coal exploitation.

## **5. A critical analysis of the Integrated Energy and Power Master Plan (IEPMP) and its implication for the national budget**

The Government of Bangladesh has recently introduced a groundbreaking initiative, the Integrated Energy and Power Master Plan (IEPMP), to tackle the surging demand for electricity and chart a path towards a more efficient and sustainable power sector. This is a milestone as it marks the country's inaugural comprehensive blueprint for the energy and power sector. In this context, a critical examination of the IEPMP reports becomes imperative. Simultaneously, it is essential to delve into the effects this plan may have on the national budget, as the energy and power sector's development often carries substantial financial implications. The plan's efficacy and fiscal consequences will play a pivotal role in shaping the country's energy landscape and economic future.

Bangladesh has previously seen a few broad-based plans regarding the power sector such as the Power System Master Plan (PSMP) 2010 and PSMP 2016 aiming at some short and medium-term goals. For instance, under the Power System Master Plan (PSMP) 2016 supported by the Japan International Cooperation Agency (JICA), technical assistance was provided to Bangladesh in creating a comprehensive energy and power development plan through the year 2041, including equilibrating strategies for energy, power, and relevant tariff structures. However, since June 2021, the Japan International Corporation Agency (JICA) has supported the Ministry of Power, Energy and Mineral Resources in developing the Integrated Power Sector Master Plan (IEPMP) in order to incorporate and update earlier energy plans, such as the Power System Master Plan 2016 (PSMP 2016), the Energy Efficiency and Conservation Master Plan 2016 (EECMP 2016), and the Gas Sector Master Plan 2017 (GSMP 2017). The goal is to ensure that the plan is compatible with the current energy trends toward low carbonization and decarbonization and to create a low-carbon society by pursuing the 3E+S idea, which seeks to protect "Energy Security," "Economic Efficiency," and "Environment" while putting "Safety" first. The plan is intended to serve as a long-term energy plan that covers the entirety of the sector and the energy resources in line with the ongoing scenarios in Bangladesh and global trends.

The method used to formulate the IEPMP is distinctive in a number of ways. It is a thorough approach that addresses issues with both power and energy. In order to comprehend energy demand, energy mix, energy efficiency, and transmission and distribution of energy, the new draft plan employs a rigorous methodology that is unique in this regard. It takes into account, among other things, three forecasts for GDP growth by 2050 based on the long-term projection of the IMF, the Perspective Plan (PP) 2041, and a range in between the two projections. Strategic environmental assessments (SEAs) were not mentioned in the PSMP 2016; however, the IEPMP has added sector-specific SEAs.

It must be noted that no Bangladeshi experts were involved in the formulation process.<sup>5</sup> Therefore, despite being quite detailed, the draft plan nonetheless hosts several preferential biases. The three main biases found in the IEPMP are excessive dependency on GDP projections, reliance on coal and LNG as the substantial fuel mix, and disregard for renewable energy. For instance, the exercise based on the GDP estimate of PP 2041 becomes dubious because it predicts a 90 gigawatt (GW) increase in electricity demand by 2050. With 70GW by 2050, the suggested "in-between" alternative scenario likewise appears debatable. The scenario based on the IMF projection, however, looks arguably probable.<sup>6</sup> The objective for renewable energy-based power generation (40% by 2041) is implausible given the high target for electricity demand. The renewables promise has also changed, now calling for "up to" 40% of energy to come from "clean" sources; however, this classifies energy derived from coal and other hydrocarbons blended with advanced technologies as "clean," which is profoundly undesirable.

There are evident inconsistencies between the IEPMP and other policy documents like the adopted Mujib Climate Prosperity Plan (MCCP), which aims to achieve 100% renewable energy by 2050. During the UN Climate Conference (COP 26) in December 2021, the prime minister reaffirmed the goal of 40% by 2041. However, the IEPMP asserts that its 2050 renewable energy objective will only be 17.1%, which is obviously at odds with the MCCP. Although the IEPMP seems to cover the whole sector, questions remain on whether this can fulfil the expectation of the much-awaited single coordinated plan which is aligned with the national policy objectives, and national interest instead of serving the intention of agents other than Bangladesh.

The current strategy places intensive focus on gas. The plan suggested that by 2050, 30.7% of the installed capacity in the power sector will be made up of fossil fuels, such as coal and LNG, and 32.8% would be made up of so-called Advanced Technology, such as liquid hydrogen, ammonia, and carbon capture and storage. According to the Perspective Plan 2041, the demand for LNG in 2050 is expected to be 7,672 mmcdf and 4,075 mmcdf (without high-risk potential) in the intermediate scenario. However, building infrastructure based on LNG requires significant investment, which is exorbitant considering the current economic downturn. Since domestic gas output is now inadequate and domestic exploration activities are minimal, it can be predicted that the power industry will likely be dependent on costly and unstable imported LNG and that imported LNG will ultimately make up a significant share of the energy mix. As a matter of fact, a plan like IEPMP cannot overlook the question of long-run energy security and the vulnerability ensued by over-reliance on energy (LNG) imports. Instead, the IEPMP has to prioritize the exploration of indigenous gas reserves in accordance with the weighted importance of clean and renewable resources that are still relatively very low in the energy mix.

As a tool for clean energy, the IEPMP intends to deploy and promote carbon capture and storage (CCS) technologies. However, unlike other countries, Bangladesh did not carry out any feasibility assessments before the commencement of its CCS pilot plants. In addition, the effectiveness of these technologies is still contentious. The cost of these technologies will

---

<sup>5</sup> <https://www.thedailystar.net/opinion/views/news/the-iepmp-serves-japans-interest-over-bangladesh-3341171>

<sup>6</sup> <https://www.thedailystar.net/opinion/views/news/more-power-what-cost-3223331>



create budgetary pressure to a greater extent. Hence, they are undesirable in the context of Bangladesh. Furthermore, the plan's objective of moving toward low carbonization may be hampered, and the switch to renewable energy may be made more difficult, by the promotion of coal and coal-based energy through so-called clean energy technologies like CCS.

The monetary strain of subsidy and capacity payments resulting from the fossil fuel-based power generation and excess reserve margins is not fully taken into account in the draft plan. The strategy has not yet adequately addressed the impact and implications of energy tariffs, despite the suggested technology modifications resulting in a sharp hike in energy prices. Instead, a clean, and most importantly, renewable energy scenario can be resource-efficient, produce more power, and save subsidy budgets in the context of the current crisis. In addition to the BDT 23,000 crore previously earmarked in the national budget for the FY2022-2023, the most recent proposal for subsidies of Tk 56,858 crore in the power and energy sector alone has stirred much controversy.

The Quick Enhancement of Electricity and Energy Supply (Special Provision) Act of 2010 should not be used to further extend the life of fossil fuel-based power facilities that are in the process of retiring. Recently, the government announced that coal-based facilities would be shut down and that HSD and HFO-based power plants would be gradually phased out. In addition to that, a recent World Bank study, on the installation of utility-scale grid-connected solar power plants at the Matarbari, Moheshkhali, Patuakhali, and Jamalpur that were originally chosen for large coal-fired power plants but were recently declared nullified on the eve of COP 26 by the Honorable Prime Minister, mentions that 8,000MW of power can be produced if the entire land is allocated to solar. But taking the existing scenario into account, they advise building a total of at least 3,800 MW grid-connected solar power stations by 2030 requiring a \$2.46 billion worth of investment.<sup>7</sup> However, neither the first draft of the IEPMP nor any of the subsequent meetings took these matters into account. The finalized plan must consider potential alternatives to fossil fuels and adhere to the government's decision to retire fossil fuel-based power plants early. Financial resources can be saved if the government implements the phase-out of oil-based power plants, puts solar photovoltaic technology in primary schools, and switches out diesel-based irrigation systems for solar-powered ones. Renewable energy has the potential to present a profitable business case in the medium and long term.

Lack of consultation with energy users in the formal and informal sectors at the industrial and regional levels, lack of open communication with key stakeholders, exclusion of Bangladeshi experts, overestimation of power demand brought on by linear analysis based on GDP projections, contradiction with other national policy documents like the Mujib Climate Prosperity Plan (MCCP), among other factors, have reduced the validity and the precision of the study. These are the major drawbacks of the IEPMP. Despite being overly ambitious, the IEPMP is the first ever unified and structured master plan for Bangladesh's power sector that focuses on sustainable energy. It is now a potent document for forwarding after rigorous analysis. Going forward, revising the ambitious goals and accelerating the implementation process may result in a sustainable power sector.

---

<sup>7</sup> [https://ep-bd.com/userfiles/EP\\_20\\_24.pdf](https://ep-bd.com/userfiles/EP_20_24.pdf)

## 6. A fiscal space analysis for the implementation of the RE target for the national budget

In order to facilitate Bangladesh's transition to a clean and RE structure, the financial resources available to the government need to be utilized in a manner that would suit the government's short and mid to long-term goals and targets for the power and energy sector of the country. An analysis of the fiscal space would allow the stakeholders to construct a comprehensive picture of the budgetary resources and their potential with regard to expenditure and investment for technological transfer and structural shifts in the power and energy sector.

The idea of fiscal space is multifarious and has been conceptualized by authors in terms of adjustments within the budgetary framework for certain investments with growth targets. For example, Ley (2009) defines fiscal space as, "the availability of budgetary resources for a specific purpose—typically growth-enhancing investment uses—without jeopardizing the sustainability of the government's financial position, or the stability of the economy." Fiscal space, as defined by the UN Development Committee, assesses a government's capacity to mobilize resources for specific development goals, factoring in policies, institutions, and the governance environment (Roy et al., 2012). The IMF takes a targeted approach, evaluating increased public savings through expenditure rationalization and tax reform, exploring additional resources from borrowing and grants, and addressing factors affecting government policy outcomes (Heller, 2005). Kose, et al., (2022) identifies fiscal space as "the ability of a government to service its debt", and in this regard, built a database of 28 indicators covering four broad aspects including government debt sustainability, balance sheet composition, external and private sector debt, and market perception of sovereign risk.

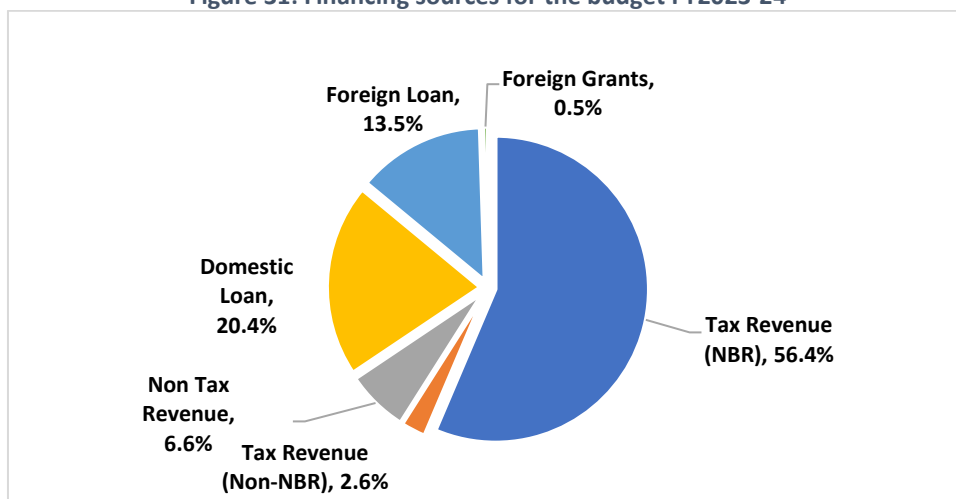
How can governments identify and expand fiscal space for sectors they decides to prioritize? In their analysis of fiscal space for governments' initiatives in sectors related to social and economic development for children and poor households, Ortiz et al., (2011) outline six options: i) Re-allocating current public expenditures, ii) Increasing tax revenue, iii) Increased aid and transfers, iv) Using fiscal and central bank foreign exchange reserves, v) Borrowing or restructuring existing debt, and vi) Adopting a more accommodating macroeconomic framework. However, these options can be considered for other prioritized sectors as well.

In this regard, it is first necessary to take a look at the sources of financing for the national budget of Bangladesh. In FY2023-24, a budget of BDT 7,61,785 crore was approved by the national parliament. Figure 31 provides a breakdown of the sources of financing for the national budget for FY2023-24. The NBR tax revenue is the main source of financing for the national budget accounting for 56.4%, followed by domestic loans (20.4%), and foreign loans (13.5%) among others. Of the NBR tax revenue, VAT accounts for 38.1%, followed by income tax (35.6%), supplementary duty (14.1%), import duty (10.7%) and others (1.4%).

On the other hand, it is necessary to estimate the cost of the transition to RE. The Bangladesh government, under the Nationally Determined Contributions (NDCs) submitted to the United Nations Framework Convention on Climate Change, has set a goal of generating more than 4,100 megawatts of electricity from renewable energy sources by 2030. Notably, according

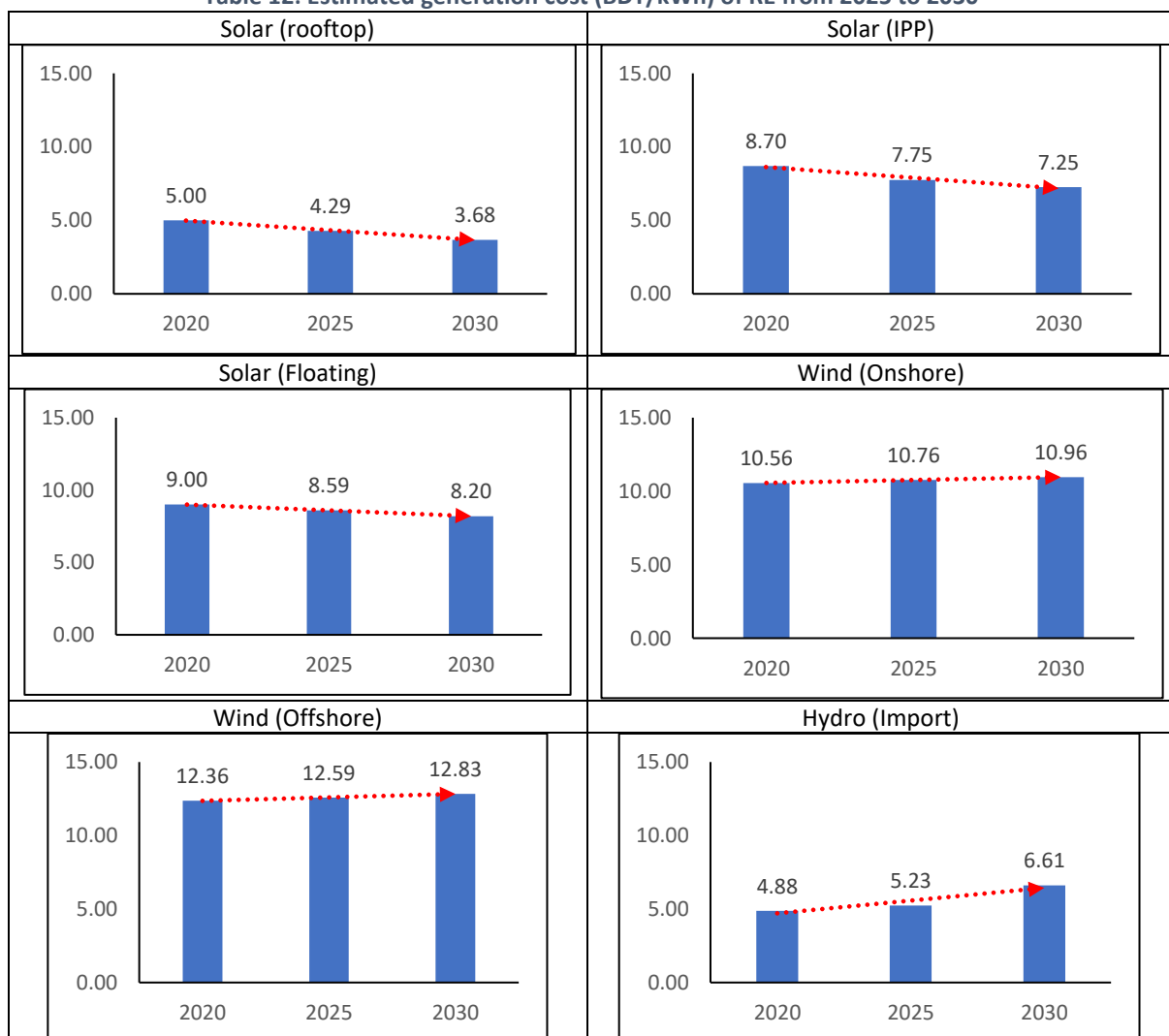
to estimations by the Infrastructure Development Company Limited (IDCOL), the cost of solar panels and inverters is presumed to be declining over time (Table 12).

Figure 31: Financing sources for the budget FY2023-24



Source: Finance Division, Ministry of Finance

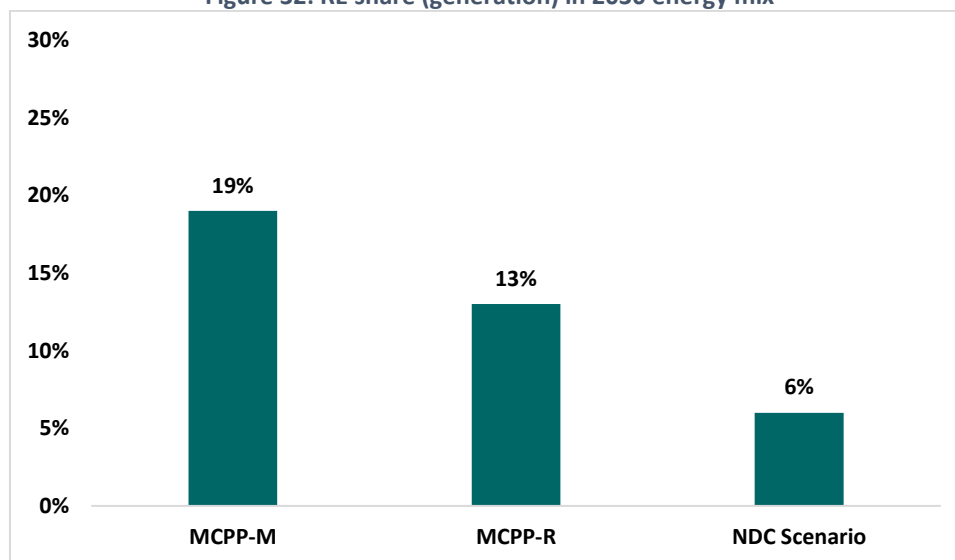
Table 12: Estimated generation cost (BDT/kWh) of RE from 2025 to 2030



Source: Adapted from IDCOL, 2021

In the “Mujib Climate Prosperity Plan—Decade 2030: Power Sector Analysis”, the IDCOL estimates shares of renewable energy under three scenarios: Mujib Climate Prosperity Plan-Maximal (MCPPP-M), Mujib Climate Prosperity Plan-Realistic Scenario (MCPPP-R), and Nationally Determined Contributions Scenario (NDC Scenario). The share of renewable energy in a generation was estimated to be highest in the MCPPP-M, followed by MCPPP-R, and NDC.

**Figure 32: RE share (generation) in 2030 energy mix**



*Source: Adapted from IDCOL, 2021*

It is, therefore, necessary to envisage the required investment for the intended target with regard to renewable energy share in power generation. The “Mujib Climate Prosperity Plan—Decade 2030: Power Sector Analysis” presents an estimate for 2025 and 2030 for all three scenarios in this regard.

**Table 13: Investment requirements by 2025 and 2030 under different scenarios**

	Scenario-1: MCPPP-M	Scenario-2: MCPPP-R	Scenario-3: NDC Scenario
Investment required by 2025 (BDT Crore)	26,675	21,193	8,819
Investment required by 2030 (BDT Crore)	69,664	44,002	18,720

*Source: Adapted from IDCOL, 2021*

It should be noted that the investment scenarios estimated by IDCOL (2021), indicate a mix of public and private investment within the stipulated timeline. The challenge, however, is to figure out the balance between public and private investment in this regard and design policies accordingly. In FY2023-24, BDT 34,819 crore was allocated for the MoPEMR. Of the budget, only BDT 994 crore was allocated to the Energy and Mineral Resources Division (EMRD). In the same year, the Power Division (PD) got an allocation of BDT 33,825 crore, among which, BDT 33,775 crore was included as the development budget. The analysis of the budgetary trend shows that fiscal resources allotted for the energy and power sector have to be scaled up by a significant margin to meet the investment requirements by 2030 for each of the three scenarios (Mujib Climate Prosperity Plan-Maximal (MCPPP-M), Mujib Climate

Prosperity Plan-Realistic Scenario (MCP-R), and Nationally Determined Contributions Scenario (NDC Scenario)).

The management of Bangladesh’s fiscal space needs to be more efficient if these investment targets are to be met, even with significant private-sector investment. Yet, low tax effort (revenue by GDP ratio), low expenditure ratio (expenditure by GDP ratio), and low fiscal deficit (usually less than 5% of GDP) are hallmarks of Bangladesh’s fiscal policy. Tax efforts in Bangladesh have been falling leading to a very low effort of less than 10% of GDP in recent years. Bangladesh is now a country with one of the lowest tax-GDP ratio in the world. Low efforts have predominantly forced us to follow a low public expenditure regime such that the deficit threshold of 5% of GDP is maintained. Public expenditure has two components – (i) current expenditure and (ii) capital expenditure. Current expenditures are essential types and inelastic (with respect to the resource envelope). The main component of capital expenditure is Annual Development Programmes (ADP) which are elastic or less inelastic (with respect to the resource envelope). In reality, the revenue mobilization and spending of public funds by the ministries are less than their planned targets leading to an even lower fiscal deficit of around 3.5 to 4% of GDP. For instance, the National Board of Revenue (NBR) fails to collect revenue as planned in the budget. Similarly, ADP implementation has never been 100% – mostly around 80% of their planned targets. Similarly, some ministries have always been failing to implement their allocations. For example, the Ministry of Health implements around 80% of its budget allocations.

Under these peculiarities of the fiscal system of Bangladesh, we assess the financing options for the additional resources required for the intended target with regard to renewable energy share in power generation. For the assessment, the fiscal outlooks as contained in the 8th Five Year Plan (8FYP) and subsequent plans have been considered as given. In particular, the fiscal outlooks of the next two five-year plans (i.e. 9FYP covering 2016-2030 and 10FYP covering 2031-2035) in addition to the ongoing 8FYP have been considered.

**Table 14: Medium-term fiscal outlook**

	8FYP		9FYP			10FYP		
	FY24	FY25	FY27	FY29	FY30	FY32	FY33	FY35
<b>Real Side (%)</b>								
Real GDP growth	7.5	7.5	7.9	8.3	8.5	8.8	8.9	8.9
CPI Inflation	6.0	6.5	5.8	5.2	5.0	4.6	4.5	4.5
Nominal GDP growth	12.8	12.9	13.1	13.3	13.4	13.4	13.4	13.4
<b>Fiscal System (% of GDP)</b>								
Revenue and Grants	10.0	11.0	11.3	14.1	15.5	16.4	16.9	17.9
Total Revenue	8.9	9.6	11.2	14.0	15.4	16.3	16.8	17.8
Total Expenditure	15.2	15.7	16.3	19.1	20.5	21.4	21.9	22.9
Non-Development Expenditure (including net lending)	8.7	9.1	10.1	12.3	13.4	14.3	14.8	15.8
Non-Development Expenditure	8.5	8.9	9.9	12.1	13.2	14.1	14.6	15.6
Development Expenditure	5.5	5.6	6.2	6.8	7.1	7.1	7.1	7.1
Overall Balance (excl. grants)	-5.2	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Overall Balance (Incl. grants)	-5.2	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
<b>Financing</b>								
External (Net) [including market borrowing]	2.0	1.5	1.7	1.9	1.9	1.9	1.9	1.9
Domestic	3.1	3.5	3.3	3.1	3.1	3.1	3.1	3.1

Source: Modified Fiscal Outlook of the Perspective Plan

The fiscal outlook seems optimistic considering the current performance. Tax efforts are projected to see a moderate increase, rising to 11.0% by the end of the 8th Five-Year Plan (8FYP). However, a significant jump is anticipated in the 9th Five-Year Plan (9FYP), with tax efforts reaching 15.5%, and a further climb to 17.9% by the end of the 10th Five-Year Plan (10FYP). These higher tax efforts are expected to create room for increased expenditures, leading to the expenditure/GDP ratio rising from 15.7% at the end of 8FYP to 20.5% at the end of 9FYP, and further increasing to 22.9% by the end of 10FYP. Despite these expenditure increases, it is planned to maintain a fiscal deficit of 5% of GDP consistently over the period. This fiscal outlook also suggests the potential for more fiscal space during 9FYP and 10FYP if the plan targets are achieved.

The analysis presents several potential avenues for securing the additional resources needed to meet the target for renewable energy's share in power generation. First, one option is to mobilize these resources by making adjustments to the Annual Development Program (ADP) amounts. Another approach could involve funding the additional resources by increasing the budget deficit. Alternatively, a combination of strategies could be employed, involving both ADP adjustments and deficit enhancement. Additionally, greater revenue generation stands as a viable means to fund these resources, while expenditure reallocation could also be explored as a means of mobilizing the necessary funds. These options provide a range of avenues to ensure the attainment of the renewable energy target in power generation.

## 7. Conclusion and policy recommendations

Due to huge subsidies and capacity payments as well as worldwide energy price hikes, the government of Bangladesh is being confronted with fiscal pressure. Consequently, the GoB undertook several austerity measures to cope with the situation. However, the strain on foreign currency reserves, which are gradually depleting, will continue to grow as the country's dependence on imported fossil fuels in the power and energy sectors rises. It is also forecasted that the capacity payments, which are mostly paid through USD, will rise further in the coming years. In addition, the effects of the post-Covid economic recovery and the Russia-Ukraine War, which led to high energy prices, have not yet been totally reversed. Hence, the fiscal strain on the government might also continue, at least in the short run. Therefore, four policy areas require immediate attention: (i) lowering fiscal burdens by cutting back on capacity payments, subsidies, and direct tax expenditures; (ii) overcoming the deadlocks and investing in domestic gas exploration; (iii) reducing reliance on fossil fuel-based energy; and (iv) promoting and increasing the use of renewable energy.

***Reducing the fiscal burdens relating to the energy sector:*** While analyzing the proposed budget, it can be inferred that the trend of budget in the power and energy sector might worsen the fiscal burden and dependence on fuel imports. The cumulative effect of capacity payment regimes, subsidies, and direct tax expenditures has adverse effect on the fiscal side and it needs urgent treatment. If this cumulative effect can be diminished, it will help us to create a more inclusive power and energy sector and more resource allocation can be made to domestic gas exploration and developments of RE. Capacity payment regimes, subsidies, and direct tax expenditures also create upward pressure on the power tariffs that ultimately lead to public unrest at the consumer level.

***Overcoming the deadlocks on the way to domestic gas exploration through budgetary stimulus:*** Since 2017, our gas production has followed a diminishing trend. Without the discovery of new gas sources, production capacity is expected to decline, and according to the experts, if the current status remains unchanged domestic gas use will be minimal by 2040. If the primary fuel shortfall continues to persist, the sector won't be able to get rid of this crisis. Although domestic gas exploration, offshore and onshore may take some time to be fruitful, it will ensure our long-term energy security along with stability in energy prices. On the other hand, LNG imports are a short-term solution which is of a volatile nature and is conditional on the world economic scenario. Therefore, prioritizing domestic gas production must be done before focusing on importing LNG to meet demand. Building new power plants should be conditioned upon domestic gas availability, not solely upon fuel import. Unfortunately, the budget allotted to the EMRD does not reflect the mindset to explore domestic sources.

***Formulating a single coordinated policy document for the overall power and energy sector and RE:*** Bangladesh has several national-level broad-based policy documents regarding the power and energy sector such as the Nationally Determined Contributions (NDCs) 2021, the Mujib Climate Prosperity Plan (MCCP), the Integrated Power Sector Master Plan (IEPMP), the Solar Energy Roadmap etc. However, all those policy documents, strategic goals, and targets are not properly aligned with each other. There should be a unique guiding principle and a single coordinated plan with certain core national objectives in terms of energy strategy.

***Ensuring transparency and accountability of the existing regulatory and implementing authorities:*** In the case of the power and energy sector, we lack a robust institutional framework. The government must ensure transparency and accountability in the process of setting power tariffs and energy prices by strengthening the legal scope of the existing regulatory institution, namely, the Bangladesh Energy Regulatory Commission (BERC). The existing capacity payment agreements and the ensuing indemnity laws must be thoroughly reviewed by the BERC. The BERC must also be transformed into a pro-people agency having an expert panel. Furthermore, the implementation capacity of BAPEX and SREDA through an increased budget, skilled manpower, and updated technologies must be enhanced.

***Formation of a separate segment in the national budget for RE and a separate division at the ministry level for facilitating RE:*** Despite the fact that renewable energy sources have the potential to deliver the least expensive energy, against the rising costs of fossil fuels, no considerable budgetary allocation has been set aside to support this source of energy. Moreover, the proposed budget has no specific roadmap for reaching the announced target of 10% RE of the total energy mix by 2030. Given the importance of RE in the context of Bangladesh, a separate segment for RE with highlighted provisions in the national budget is required and likewise India a separate division at the ministry level for facilitating RE should also be established.

***Promoting private investment in RE through adequate budgetary incentives:*** Despite Bangladesh's potential in the area of RE, there is insufficient investment in it. The national budget has not offered many incentives to draw FDIs and private investments. Although the target is to reach 10% of RE by 2030, the implementation rate of RE is still ranging from 3% to

4%. According to the Nationally Determined Contributions (NDCs) 2021, the required investment across the RE sector for the implementation of key mitigation measures in the energy sector under the unconditional and conditional scenario is USD 2073 million and USD 5006 million respectively. The actual investment level does not match the commitment level. Considering the current scenarios in the power and energy sector, in order to have a significant change in the RE there must be a strong push factor from the government and in order to attract FDIs and private investments in this sector, the national budget has to offer appropriate incentives and policy stimulus.

***Providing fiscal incentives for RE:*** In order to import solar accessories into Bangladesh, the importers have to face import duties ranging from 15.25% to 58.6% on several accessories such as fibre-reinforced polymer walkways, imported inverters, mounting structures, and direct current cables. All these raise project costs and act as a disincentive to adopting RE. According to the Institute for Energy Economics and Financial Analysis (IEEFA), the aggregate financial gain from a 1,000MW of rooftop solar over 25 years would be BDT 18,375 crores (USD 1.73 billion), which is almost 30 times higher than the one-time taxes that the government would amass during the same time. It clearly indicates that Bangladesh would benefit from the duties being dropped than from the one-off import revenues<sup>8</sup>. Therefore, in the national budget, exemption/reduction of relevant duties on RE-related products should be considered with due importance.

***Exploring cost-effective use of battery storage for flexible generation of RE:*** One major issue with RE affecting the flexibility of the power sector is the challenge of this form of energy in the absence of sunlight. However, if we can accommodate battery storage systems with the new grid-scale solar projects, this challenge can be tackled. In this context, though the cost of energy storage is yet to be at a bargaining level, the likelihood of it getting cheaper and more viable in the future is expected. Hence, new grid-scale solar pilot projects backed by battery storage systems would be a pragmatic solution. These piloting provisions could be brought under the energy and power sectors' budgetary allocation through government initiatives through a number of facilitating mechanisms for the implementation of storage facilities.

***Popularizing solar irrigation in rural Bangladesh:*** In the context of Bangladesh, solar irrigation is a less popular yet more effective mode of utilizing solar energy which can reduce dependence on diesel consumption in Bangladesh. There should be a separate budgetary allocation from the government for the conversion from diesel-run irrigation systems to solar-based irrigation to ensure an uninterrupted and carbon-free energy supply. The Infrastructure Development Finance Company Limited (IDCOL) is currently responsible for supporting this initiative with funding from donor agencies. However, to facilitate the rapid sectoral transformation of a sector comprising 1.07 million irrigation systems, IDCOL needs additional support. According to IEEFA, by minimizing diesel use in irrigation with solar-driven systems, Bangladesh could cultivate 4,000 megawatts (MW) of solar capacity and thereby reduce fuel import bills totalling USD 917 million per annum. It would also immensely help Bangladesh to accomplish her climate sector goals and prevent 3.7 million tonnes of CO<sub>2</sub> emissions per year.

---

<sup>8</sup> <https://ieefa.org/resources/four-point-budget-proposal-boost-clean-energy-bangladesh>



**Motivating the private sector towards RE and resolving the conflict of interests in the power sector:** The inter-sectoral transition is beset with some impediments related to the political economy which is actually more complex than it may seem to be. The lack of mobility of investment resulting from the varied and vested interests of big business blocks, their efforts to influence policy formation and implementation, and the culture of guaranteed profit in the fossil fuel-based power generation industry augmented the crisis to a great extent. The government should design the budget for the power and energy sector in such a way that it may encourage the business blocks to gradually shift the investment frameworks to RE.

## References

- Ahmed, M. T. & Aahad, M. A. (2023). *Heavy reliance on LNG import*. The Financial Express. <https://today.thefinancialexpress.com.bd/views-opinion/heavy-reliance-on-lng-import-1699452127>
- Bangladesh Power Development Board (2022). *Annual report 2021-22(Revised)*. [https://bpdb.portal.gov.bd/sites/default/files/files/bpdb.portal.gov.bd/annual\\_reports/7b792f67\\_bf50\\_4b3d\\_9bef\\_8f9b568005c9/2022-11-29-05-22-0dea17e09d8a84e72a63312df6b5bdc6.pdf](https://bpdb.portal.gov.bd/sites/default/files/files/bpdb.portal.gov.bd/annual_reports/7b792f67_bf50_4b3d_9bef_8f9b568005c9/2022-11-29-05-22-0dea17e09d8a84e72a63312df6b5bdc6.pdf)
- BER. (2023). *Bangladesh Economic Review*. Financial Division. Ministry of Finance. Available at: <https://mof.portal.gov.bd/site/page/28ba57f5-59ff-4426-970a-bf014242179e/Bangladesh-Economic-Review-2023>
- CPD. (2023). *CPD: No immediate good news for the power, and energy sector*. Available at: <https://www.dhakatribune.com/business/2023/06/22/cpd-no-immediate-good-news-for-the-power-energy-sector>
- Daily Star. (2021). *Govt officially cancels 10 coal power plant projects*. Available at: <https://www.thedailystar.net/news/bangladesh/governance/news/govt-officially-10-coal-power-plant-projects-2119405>
- Heller, P. (2005). Back to basics-fiscal space: What it is and how to get it. *Finance and Development-English Edition*, 42(2), 32-33.
- Kose, M. A., Kurlat, S., Ohnsorge, F., & Sugawara, N. (2022). A cross-country database of fiscal space. *Journal of International Money and Finance*, 128, 102682. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0261560622000857>
- Ley, E. (2009). Fiscal policy for growth. Available at: [https://www.researchgate.net/publication/279663723\\_Fiscal\\_Policy\\_for\\_Growth](https://www.researchgate.net/publication/279663723_Fiscal_Policy_for_Growth)
- Maxwell, D., & Zhu, Z. (2011). Natural gas prices, LNG transport costs, and the dynamics of LNG imports. *Energy Economics*, 33(2), 217-226.
- Medlock III, K. B. (2010). LNG, Globalization, and Price Volatility: Understanding the Paradigm Shift.
- Moazzem, K. G. (2019). *The power and energy sector of Bangladesh: Challenges of moving beyond the transition stage*. <https://cpd.org.bd/resources/2019/03/The-Power-and-Energy-Sector-of-Bangladesh.pdf>
- Moazzem, K. G., & Shibly, ASM. S. A. (2020). *What the power sector budget should look like during a pandemic*. The Daily Star. <https://www.thedailystar.net/business/news/what-the-power-sector-budget-should-look-during-pandemic-1931677>

- MoF. (2023). *Towards Smart Bangladesh Sustaining the Development Achievements in a Decade and a Half*. National Budget Speech 2023-24. Available at: [https://mof.portal.gov.bd/sites/default/files/files/mof.portal.gov.bd/page/b29661b6\\_927f\\_4012\\_9f83\\_5ac47dbd6ebd/Budget%20Speech%202023-24%20English%20Final%20Press%20%282%29.pdf](https://mof.portal.gov.bd/sites/default/files/files/mof.portal.gov.bd/page/b29661b6_927f_4012_9f83_5ac47dbd6ebd/Budget%20Speech%202023-24%20English%20Final%20Press%20%282%29.pdf)
- Nicholas, S. (2022). Bangladesh: Invest in renewable energy, not imported LNG. *Institute for energy economics and financial analysis*. Retrieved from <https://ieefa.org/resources/bangladesh-invest-renewable-energy-not-imported-lng>
- Norouzi, N. (2021). Post-COVID-19 and globalization of oil and natural gas trade: Challenges, opportunities, lessons, regulations, and strategies. *International journal of energy research*, 45(10), 14338-14356.
- Ortiz, I., Chai, J., & Cummins, M. (2011). Identifying Fiscal Space: Options for Social and Economic Development for Children and Poor Households in 184 Countries. Available at: <https://resourcecentre.savethechildren.net/document/identifying-fiscal-space-options-social-and-economic-development-children-and-poor/>
- PSMP. (2016). Power Sector Master Plan 2016. Available at: [https://powerdivision.portal.gov.bd/sites/default/files/files/powerdivision.portal.gov.bd/page/4f81bf4d\\_1180\\_4c53\\_b27c\\_8fa0eb11e2c1/PSMP2016%20Final%20Report-compressed.pdf](https://powerdivision.portal.gov.bd/sites/default/files/files/powerdivision.portal.gov.bd/page/4f81bf4d_1180_4c53_b27c_8fa0eb11e2c1/PSMP2016%20Final%20Report-compressed.pdf)
- Roy, R., Heuty, A., & Letouzé, E. (2012). Fiscal Space for What? Analytical Issues from a Human Development Perspective 1. In *Fiscal space* (pp. 31-66). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781849771344-3/fiscal-space-analytical-issues-human-development-perspective-1-rathin-roy-antoine-heuty-emmanuel-letouz%C3%A9>
- Tang, C., & Aruga, K. (2020). A study on the pass-through rate of the exchange rate on the Liquid Natural Gas (LNG) import price in China. *International Journal of Financial Studies*, 8(4), 70.
- TBS. (2023). *An anatomy of power crisis*. The Business Standard. Available at: <https://www.tbsnews.net/bangladesh/energy/anatomy-power-crisis-644066>
- Zubayer, S. A., & Ahmed, M. T. (2023). *Bangladesh's energy sector: Short-term success vs long-term sustainability*. The Business Standard. Available at: <https://www.tbsnews.net/thoughts/bangladeshs-energy-sector-short-term-success-vs-long-term-sustainability-596622>

SANEM, launched in January 2007 in Dhaka, is a non-profit research organization registered with the Registrar of Joint Stock Companies and Firms in Bangladesh. It is also a network of economists and policymakers with a special emphasis on economic modeling. SANEM aims to promote objective and high quality research in the areas of international trade, macroeconomy, poverty, labour market, environment, political economy and economic modeling. SANEM contributes to government policy-making by providing research supports both at individual and organizational capacities. SANEM has maintained strong research collaboration with global, regional and local think-tanks, research and development organizations, universities, and individual researchers. SANEM arranges regular training programs on economic modeling and contemporary economic issues.



SANEM Publications  
252/3, North Goran, Khilgaon  
Dhaka-1219, Bangladesh