



A Quarterly Publication

# ENERGY OUTLOOK



## BANGLADESH'S IEPMP RAISES MORE QUESTIONS THAN IT ANSWERS

Shafiqul Alam

The article discusses the critical issues Bangladesh's energy sector faced over the years and analyse the aspects that could have better addressed the overall situation. Despite successful electrification efforts, poor planning has led to overcapacity and fuel shortages, causing frequent power outages. The article shows how the focus on importing LNG and neglecting domestic gas exploration, combined with political interests and inefficient management, exacerbated the crisis.

This article critiques Bangladesh's Integrated Energy and Power Master Plan (IEPMP), approved in June 2023, for lacking clear solutions to BPDB's revenue shortfall and increasing reliance on imported fossil fuels. It raises concerns over unproven technologies like carbon capture and ammonia co-firing, and argues the plan underestimates renewable energy potential. The author calls for revisiting the IEPMP to address energy security risks, enhance BPDB's financial health, and focus on local energy resources, including renewables.

## BANGLADESH'S ENERGY SECTOR: WHAT WENT WRONG?

Ekramul Hasan and Lubaba Mahjabin Prima

This article highlights inefficiencies and corruption in Bangladesh's energy sector under the previous regime. It calls for reforms to restore the Bangladesh Energy Regulatory Commission's powers, scrap unfair procurement practices, phase out subsidies, and eliminate the capacity payment clause. The authors emphasize diversifying energy sources, improving fuel procurement strategies, and enhancing domestic exploration to ensure long-term sustainability and efficiency in the sector.

## NAVIGATING THE ENERGY MAZE: POLICY REFORMS FOR BANGLADESH

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## Bangladesh's IEPMP Raises More Questions than It Answers

### Shafiqul Alam



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With varying directions from different energy policies, Bangladesh approved its first Integrated Energy and Power Master Plan (IEPMP) in June 2023 to streamline the pathway for the energy and power sectors. There were high hopes that the IEPMP would accelerate the renewable energy transition and enhance national energy security. However, the master plan has thus far given little signal in that direction.

The IEPMP provides no roadmap to contain the Bangladesh Power Development Board's (BPDB) deepening revenue shortfall. Further, it puts the country at the risk of imported fossil fuel lock-in and a disorderly energy transition relying on unproven technologies, such as carbon capture and storage (CCS) and ammonia, raising more questions than addressing concerns.

#### IEPMP does not offer a solution to BPDB's revenue shortfall

As an integrated policy document, the IEPMP must ensure that Bangladesh's key power and energy sector organisations are on board, driving them towards sustainability. This call becomes louder on the back of the BPDB's annual revenue shortfall, which compelled the Bangladesh government to pay a cumulative subsidy of Bangladeshi Taka (Tk) 809.7 billion (US\$6.88 billion) during the fiscal year (FY) 2020-21 to FY2022-23. However, the IEPMP has no answer to the BPDB's diminishing financial strength.

One of the key reasons behind BPDB's revenue shortfall is the industry sector's tepid demand growth in the grid electricity consumption. Due to a lack of reliable grid electricity, industries combined operate around 3,000 megawatts (MW) of gas-fired captive generators even as grid electricity remains underutilised. The IEPMP's natural gas demand outlook suggests industries may significantly depend on gas-fired captive generation beyond 2040 (see Figure 1).

With nuclear power plants and several fossil-fuel-fired baseload plants scheduled to be online by 2027, the BPDB will continue to incur heavy revenue shortfall from underutilisation of power capacity unless industries gradually shift to grid electricity.

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Figure 1: Future Gas Outlook for Captive Power Generation\*



Source: IEEFA, 2024.

\*PP2041 scenario assumes an economic growth rate of 8% in 2025, which will rise to 9.8% in 2040 and eventually reduce to 6.8% in 2050; the in-between scenario considers the economic growth rate to reach 8.6% in 2040 and then coming down to 5.6% in 2050.

#### Growing risk of import dependence

Under different scenarios, the IEPMP's proposed energy mixes will make Bangladesh more import-dependent, exposing it to the high price volatility of the international energy market and raising concern over foreign currency reserves. These are evident from the outlook of the natural gas supply balance, which estimates Bangladesh's liquefied natural gas (LNG) demand to reach between 2,845 million cubic feet per day (MMcfd) and 6,442MMcfd in 2050 under the Perspective Plan (of Bangladesh 2021-) 2041 and in-between scenarios, respectively, locking-in high import dependence. IEEFA's calculation, based on IEPMP's projections, shows that LNG imports will soar between 4.35 and 9.85 times in 2050 compared with the 2023 level. As such, Bangladesh will incur annual LNG import costs between US\$8 billion and US\$18.2 billion in 2050 (taking a low LNG price of US\$8 per metric million British thermal units (MMBtu)). The economic burden will drastically increase if the LNG price spikes to US\$40/MMBtu. Notably, Bangladesh suspended LNG purchases from the spot market when the price crossed US\$40/MMBtu in 2022.

The IEPMP also predicts that Bangladesh will start using hydrogen in 2040, with the likelihood of its share reaching between 7.6% and 8.5% of the country's total primary supply in 2050. The master plan states that the country will mostly rely on imported hydrogen, intensifying energy security risks further.

#### Unproven technologies may derail the country's energy transition

While the IEPMP concludes that CCS and ammonia co-firing technologies are in their infancy and must undergo a rigorous evaluation, it considers the likely contribution of CCS with natural gas-fired plants ranging from 6% to 7.4% in the country's power system in 2050. IEEFA's assessment casts serious doubt on CCS projects' technical and economic feasibility and effectiveness. This raises the question of whether Bangladesh should take the risk of its aspiration to bury carbon dioxide underground in place of harnessing some easy and proven renewable energy and energy efficiency solutions.

In the same breadth, ammonia co-firing with coal-fired plants, a solution suggested by the IEPMP, would require significant investments that may not yield the desired emission reduction results.

Furthermore, the IEPMP charts four hydrogen options:

1. grey hydrogen from fossil fuels
2. blue hydrogen from grey hydrogen with CCS
3. pink hydrogen from the surplus electricity produced by nuclear plants
4. green hydrogen from surplus electricity produced by renewable energy systems

Notably, the IEPMP admits these hydrogen technologies are economically inconvenient for Bangladesh. When Bangladesh struggles to shore up renewable energy capacity, it is unlikely that the country will have surplus electricity from renewable energy to produce hydrogen in the foreseeable future. Instead, it should work on ramping up renewable energy.

Therefore, Bangladesh needs to factor all risks associated with these technologies into investment considerations.

### Limited focus on Renewable Energy

The IEPMP seems overly conservative on the possibility of yielding great success in renewable energy. The master plan anticipates solar and wind to remain variable even in 2050, as it has excluded the potential role of battery storage. As such, renewable energy will only meet 5.4% of

Bangladesh's total primary energy requirement in 2050 against the clean energy's share of up to 30%. The master plan's caution about land scarcity does not portray the reality because a combination of distributed and utility-scale renewable energy may unleash immense opportunity in Bangladesh.

The IEPMP should be a blueprint, with projections of rational demand and supply sources, to guide Bangladesh's energy and power sectors towards sustainability, slashing imported fossil fuel dependence. As renewable energy and battery storage continue to experience cost drops and BPDB faces a hefty annual revenue shortfall, there is potential for the IEPMP to evolve to address its shortcomings. Moreover, the IEPMP should avoid unreliable technologies that may land Bangladesh at a far greater risk.

As the IEPMP is a living document that mentions "the plan is not the end of product", Bangladesh should revisit the document to design a clear pathway for improving BPDB's financial strength and Bangladesh's energy security, avoiding unproven technologies. More importantly, the revised IEPMP should help enhance the country's resilience against sudden price spikes and supply issues in the international fuel market by directing towards utilising local energy resources, including renewables.

## Bangladesh's Energy Sector: What went wrong?

Ekramul Hasan and Lubaba Mahjabin Prima

Bangladesh's energy sector, particularly the power sector, is at a critical juncture, facing a crisis that could have been avoided with better planning and decision-making. Over the past decade, Bangladesh has achieved remarkable success by achieving the remarkable feat of electrifying almost every household. From just 8000 kilometres in 2009 to over 13,213 kilometres in 2022, the length of the country's transmission line network has massively expanded. However, this seemingly successful feat remains more of a political feat, and this facades much bigger structural problems underneath. The former government's drive for rapid capacity enhancement, which saw installed capacity outstrip actual demand, did not consider the fuel shortages that would arise. As a result, the nation has been witnessing rapid power outages since 2023, with everyday lives and commercial activities being compromised, while many of the power plants remain underutilized due to a lack of gas, coal, or oil, exacerbating the energy crisis.

The country is now grappling with a shortage of foreign reserves, making it difficult to import fuel, while domestic fuel supplies, mainly natural gas, are depleting at a rapid pace. Amidst depleting domestic natural gas supplies, Bangladesh turned to importing LNG as a quick fix to offset the declining production from domestic gas fields. However, this decision was short-sighted, as it neglected the country's significant potential of hydrocarbon inside the country. Despite the huge potential of offshore gas and the success of Bangladesh Petroleum Exploration and Production Company Limited (BAPEX) in gas exploration,

domestic sources have not received priority.

This strategy benefited a few vested interest groups, as the LNG import business provided lucrative opportunities for private players and government-affiliated entities. These entities profited from the import and distribution of LNG while the general population faced rising energy costs. As the dollar crisis deepened and foreign reserves dwindled, Bangladesh found itself unable to afford the necessary LNG imports, plunging the country into an even deeper energy crisis. An alternative approach would have been to prioritize domestic gas exploration, especially in the offshore areas where Bangladesh shares geological similarities with Myanmar, a country that has successfully exploited its offshore gas fields.

With domestic reserves of gas running low, the country is bound to import from abroad, being at the mercy of global price fluctuations. The conditions have worsened after the Ukraine-Russia war, with fuel prices soaring massively. Along with high fuel import cost, Bangladesh also witnessed a trend of investors proposing unrealistically high production costs when it comes to different project proposals in the energy sector. They also increased project duration knowing that the longer the duration, the greater the cost, leading to cost of producing electricity increased by two or three folds. Investor selection was also done in a particular manner, misusing the indemnity benefit to the government officials and employees from legal proceedings related to their actions taken under the Electricity and Energy Rapid Supply Increase (Special) Act, 2010.



Bangladesh has a systematic lack of efficiency, with overcapacity being a consistent problem affecting the financial health of the country's power sector. In December 2023, the maximum electricity demand was only 10.92 gigawatts (GW). Considering an annual growth of 7%, this might rise to 27.1 GW in 2030, while the current capacity stands at around 28 GW in 2024. Hence, Bangladesh's real problem lies not in generation capacity, but in ensuring the primary energy supply for power plants. The decision to allow so many IPPs to operate without ensuring the long-term availability of natural gas or coal was a strategic failure. The government focused on expanding capacity at all costs, without securing a steady fuel supply for these plants.

This has left Bangladesh in a situation where it pays for idle capacity while struggling to meet actual energy demand. This policy has also discouraged investment in renewable energy, as the fossil fuel-based plants have been given preferential treatment through guaranteed payments. One of the most controversial aspects of Bangladesh's energy policy is the deal with India's Adani Group, which exports electricity to Bangladesh from a coal-fired power plant in Jharkhand, India. This deal is alleged to be a political settlement, and Bangladesh pays a capacity charge to Adani's plant, even though it is situated outside Bangladesh's borders. What makes this arrangement particularly damaging is that Bangladesh is paying higher-than-market rates for the imported electricity, further straining its already limited foreign reserves.

A more prudent approach would have been to carefully assess the country's fuel supply situation before approving so many IPPs. Additionally, rather than relying on capacity charges, the government could have incentivized performance-based contracts, where payments are tied to actual electricity production, thus encouraging efficiency and better fuel management. Such a strategy would have reduced the financial burden on the government and improved overall energy sector performance.

Renewable energy remained a peripheral part of the energy mix, even though it could have provided a reliable

and sustainable solution to the country's energy needs, particularly in remote areas where extending the national grid is expensive and inefficient. Renewable energy projects received insufficient government support. There were few incentives for private investment in renewables, and the regulatory framework for grid integration was weak. In contrast, countries like India and Vietnam have made significant progress in renewable energy adoption, reducing their dependency on fossil fuels and improving energy security. Bangladesh could have followed a similar path by providing subsidies for solar and wind projects, simplifying regulations for renewable energy investors, and promoting energy-efficient technologies. This would have reduced the country's reliance on imported fuels and mitigated the current crisis.

Moreover, regarding the energy sector of Bangladesh, there is a lack of coordination among the concerned energy bodies of the government, often imposing policies and measures that counteract each other. Such practices are a waste of public resources and hinder a coordinated energy effort. There exists a fragmented policy environment, characterized by inconsistent targets, overlapping timelines, and a lack of inter-agency coordination. This disjointed approach hinders the nation's ability to efficiently transition to renewable energy, underscoring the need for a more cohesive and integrated policy framework that aligns the efforts of all relevant stakeholders toward common, achievable goals. Institutional strengthening is urgently needed in Bangladesh and specifically, the agencies directly involved with energy need capacity building. On the other hand, there is an absence of energy justice in Bangladesh. Tax policy has to be reformed to incorporate energy justice and there is an urgent need to develop a well-defined transparent national aggregate policy.

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## Navigating the Energy Maze: Policy Reforms for Bangladesh

Sheikh Tausif Ahmed and Takrem Ferdous Surid

The energy sector of Bangladesh was plagued by institutional inefficiency and deliberate mismanagement by the previous regime. The regime allowed for mass plunder of public money & accruing massive debts in the energy sector. The crisis was exacerbated by various external pressures—such as volatility in the global energy market. Now, the new administrative structure has opened doors for major reforms in many sectors, including the energy sector.

**Policy Reforms:** The most important instruments in the energy sector are the policies that govern how the energy sector is regulated. Bangladesh Energy Regulatory Commission (BERC) which was established through an act in 2003, to create a competitive environment in the energy market & ensure fair pricing strategies. However, two amendments to the act in 2020 & 2023 have left the commission without much of its intended functionality. Particularly, the amendments had given the government

arbitrary power to set energy prices without a public hearing. Reforms should see the commission gain some practical power in regulating energy supply & price. However, the Quick Enhancement of Electricity and Energy Supply (Special Provision) Act, 2010, was another controversial act by the previous government. This allowed for quick rentals to be set by Independent Power Providers (IPPs) without competitive bidding and also overrides the 2006 Procurement Act, intended for fair practice in government procurement. This created an opaque standard in government practice for energy generation & sectoral procurement. Despite, the initial plan to make use of this act for two, years it has been amended & extended to be in power till 2026. A reform in this sector should see this law immediately scrapped. Additionally, the Mujib Climate Prosperity Plan (MCP) & Perspective Plan 2041 (PP41), require amendments. MCP is a modern thinking in the energy sector, which has set the goal to achieve 30%

renewable energy capacity by 2030. However, in reality, the progress is far off from the target. PP41 too has set lavish goals for energy generation & has projected excessive demands for the future. Demand projections in every aspect of the government's energy policy need to be revised, for setting generation goals & pricing strategy.

**Operational & pricing strategy reforms:** Through the amendment of the BERC act, the previous government had created a questionable practice of setting energy prices. Without a public hearing or a specific methodology to set the prices, the government could hike the energy price at will. However, in recent times, the government followed a specific strategy of reducing & eventually removing the subsidies in the energy sector, following pressures from the IMF to do so. Due to this policy, the government hiked the energy price by 5% each month, from January to March of 2023. Despite the hikes, the government had to allocate a massive BDT 40,000 crore of subsidy in the energy sector, mainly to make good on the energy arrears from the past. The government needs to create a competitive system of electricity generation first. The amendments of the BERC allowed for certain groups of people to monopolize the sector & control the market prices. Allowing for a competitive space with many players would allow for a competitive buying rate.

Secondly, the energy sector needs to set a pricing strategy according to proper demand projections. In this regard, the demand projections need to be fixed using advanced models. According to the demand projections, a pricing strategy needs to be set. Before selecting a long-term pricing strategy, discussions need to be held with stakeholders. Public hearings could be arranged in this regard to inform the people about various strategies & price projections.

Thirdly, subsidies need to be phased out completely. Energy subsidies eat up a large amount of the government budget. This reduces the amount left for the operating portion of the budget & government needs to finance its deficit by borrowing from outside sources. This ultimately increases the debt in the energy sector and increases the public sector debt as a whole. The previous plan of scrapping the subsidies needs to be followed but with certain amendments to the plan. The price hike due to the gradual removal of subsidies, needs to be systematic & justified. The price hikes in the past year were very controversial as they were not discussed with the consumers and stakeholders. This practice needs to be avoided.

Fourth, the capacity payment clause needs to be immediately removed. This provision allows for the power plants to collect money even if they are not producing any electricity instead of 'fixed costs' for keeping the plants operational. The government has paid BDT 26,000 crore in 2023 alone for capacity charges to the power plants. Reforms should address this issue and take up the policy of only paying for the energy that is being produced.

**Energy supply:** Questionable procurement practice by the government meant that the supply was being controlled by only a few players in the market.

Monopolization of the IPP market & allowing a few companies to illegally insert their dominance, allowed for arbitrary price setting by these oligarchies & extraction of capacity charges, despite generating no power. Non-local producers, such as the Adani group from India were allowed to supply electricity and were promised almost USD 450 million in capacity charges each year, even if no electricity is produced.

Reforms should involve a switch from IPP-based quick-rentals to a more sustainable power-producing method. In the short run government should focus more on utilizing public sector production capability & making full use of the existing power plants. As of 31 August 2024, grid generation capacity was 27,791 MW, while the maximum demand served stood at 16,477 MW on the same date. While the maximum demand projected for this year is 17,800 MW. There is a surplus in energy generation capacity & even then, the generation capacity is being underutilized, evident in frequent power cuts across the country.

One of the many reasons why this mismatch is occurring is due to the idle nature of many powerplants caused by the fuel shortage, which in turn was caused by the global hike in fuel prices in recent years, stemming from supply-chain issues & Russia-Ukraine conflict. Price fluctuations due to global shocks are almost unavoidable, but the effects can be controlled. Bangladesh still buys much of its fuel from the spot market, where price fluctuations are reflected in the domestic price level. If the price contract can be done in futures or forward contracts, where the supplier needs to supply fuel at a later date but at the predetermined price. This gives the buyer some hedge against price fluctuations. Similarly, bilateral agreements with supplying countries could be very useful.

The government should also plan to diversify its source pool. Currently, Natural gas including LNG comprises 43.35%, and furnace oil 21.18% of the fuels used for electricity generation. Whereas, renewable sources only account for 2.39% and hydropower provides 0.83%. The shares of sustainable sources need to be increased. Dependence on imports needs to be reduced. Oil-gas exploration needs to be strengthened, especially exploration in the Bay of Bengal needs to be carried out. Plans for deep-sea energy explorations had been taken many times previously but somehow, they vanished later on. Transmission capacity needs to be enhanced. System loss is a major concern for Bangladesh, as electricity stealing and power leakage cause huge losses every year.

Taking these steps would only begin to reduce the damage done in the energy sector by the previous regime. A long path is ahead for our country to become fully efficient in energy generation and consumption. Which could save billions of dollars in public money.

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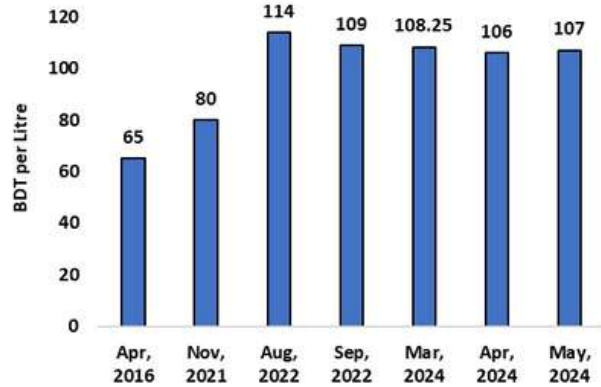
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Figure 1: LNG Buying Price in Bangladesh



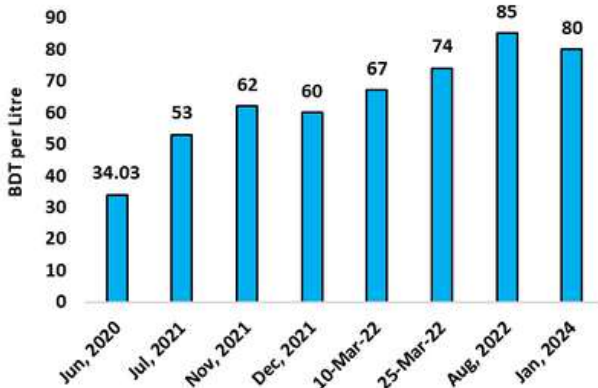
Source: Petrobangla

Figure 2: Diesel Price in Bangladesh



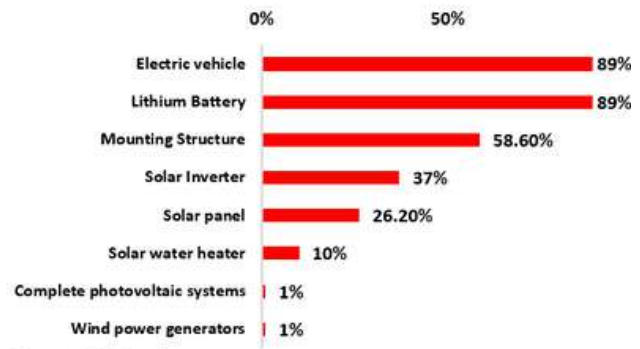
Source: Bangladesh Power Development Board

Figure 3: Furnance Oil Price in Bangladesh



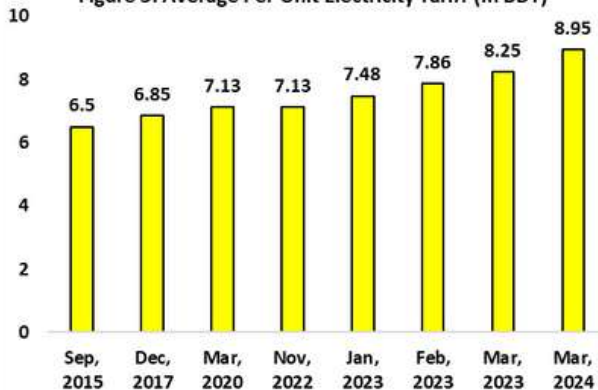
Source: Banaladesh Petroleum Corporation

Figure 4: Import Duty on Renewable Energy Related Components



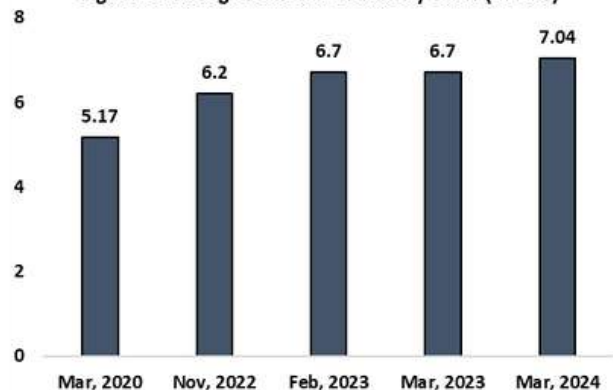
Source: PV Magazine

Figure 5: Average Per Unit Electricity Tariff (In BDT)



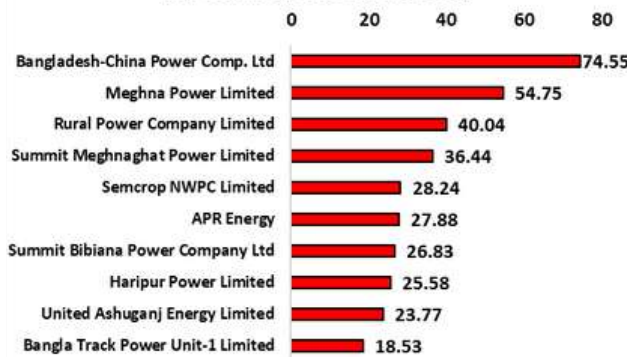
Source: Bangladesh Energy Regulatory Commission

Figure 6: Average Bulk Unit Electricity Tariff (In BDT)



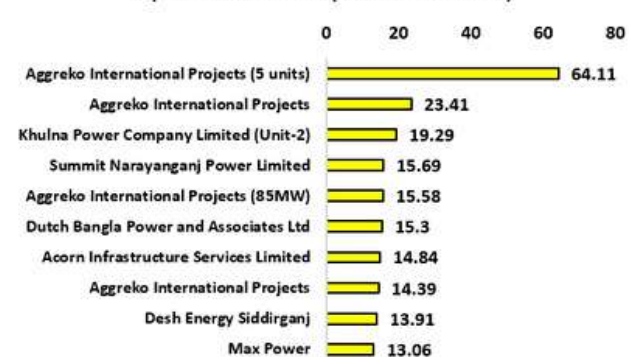
Source: Bangladesh Energy Regulatory Commission

Figure 7: Capacity Charge (Billion BDT) Received by Top Ten IPPs (2009-30 June 2023)



Source: State Minister of MoPEMR in Parliament in 2023

Figure 8: Rental Payment (Billion BDT) Received by Top Ten Power Plants (2009-30 June 2023)



Source: State Minister of MoPEMR in Parliament in 2023



SANEM Energy Outlook is a quarterly newsletter dedicated to disseminating SANEM's research on Bangladesh's transition to green and clean energy. SANEM, a non-profit research organization established in January 2007 in Dhaka and registered with the Registrar of Joint Stock Companies and Firms in Bangladesh, focuses on economic modeling and policy research specific to South Asia. It aims to deliver high-quality, objective research to support policy-making in the region. SANEM collaborates extensively with global, regional, and local think tanks, research organizations, universities, and individual researchers to enhance its research impact.

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