

# ENERGY TRANSITION REPORT



কনজুমারস এসোসিয়েশন অব বাংলাদেশ (ক্যাব)

## Energy Transition Report

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## Power Generation scenario of Bangladesh:

Gas-based power plants contribute to 55.06% of the domestic power generation installed capacity in Bangladesh, HFO (Heavy Fuel Oil) based Power plants account for 26.71 %, HSD (High-Speed Diesel) Power Plants contribute to 1.71%, Coal Power imports make up 6.24%, Hydroelectric power contributes 0.87%, power import accounted for 9.01% and Solar and solar power and other renewable energy sources account for 0.38 % of the domestic power generation installed capacity

### Fuel scenario:

*The gas scenario in Bangladesh can be summarized as follows:*

- Bangladesh has a total of 26 gas fields, out of which gas production is currently possible from 20 fields. The average gas production from these 20 fields is 2,978 million cubic feet per day (mcf). The proven and probable recoverable gas reserves in Bangladesh are estimated to be 40.09 trillion cubic feet (tcf), while the remaining recoverable reserves are 9.0 tcf. With of 0.97 TCF in 2018, indigenous gas reserves will annual production only last up to 2026.
- The domestic gas exploration capacity in Bangladesh is 2,306.83 million cubic feet per day (mmcf). Among the domestic gas production capacity, Tullow Bangladesh has a capacity of 56.80 mmcf, Chevron has a capacity of 1,405.85 mmcf, Sylhet Gas Field Limited has a capacity of 88.07 mmcf, Bangladesh Gas Field Limited has a capacity of 618.8 mmcf, and BAPEX (Bangladesh Petroleum Exploration and Production Company Limited) has a capacity of 138.84 mmcf. This indicates that approximately 63% of the domestic gas production is carried out by international oil companies (IOCs), while the remaining 37% is produced by Bangladeshi companies.



## Long-Term LNG Sales and Purchase Agreements (SPA):

- Bangladesh has a 10-year SPA with Qatar Gas (Ras Laffan Liquefied Natural Gas Company Limited - 'RL') or Ras gas for importing 2.5 million metric tons per year and Oman Trading International (OTI) OQ Trading Limited for importing 1.5 million metric tons per year.

## Total LNG Imports:

- Bangladesh imported a total of 4.18 million tonnes of LNG in the previous year.
- Spot Market Master Sales Purchase Agreement (MSA):
- Bangladesh has signed MSA contracts with 16 companies for LNG purchases in the spot market. The spot market accounted for 1,036.44 million cubic meters of LNG.

## Imported LNG:

- The total imported LNG volume in Bangladesh is 7,078.29 million cubic meters.
- Qatar supplies 4,036.66 million cubic meters, while OQ Trading Limited supplies 2,005.41 million cubic meters.

## Supply and Demand:

- The total available gas supply in Bangladesh, including domestic production and imported LNG, is 31,221.71 million cubic meters where total gas demand in Bangladesh is 36,262 million cubic meters. The combined production of the Indian Oil Corporation (IOC) and the National Gas Company in Bangladesh is 24,143 million cubic meters per year. Currently, 26% of the national gas demand is met through LNG import.

## Coal Scenario of Bangladesh:

Bangladesh has discovered five coal fields, namely Barapukuria, Khalaspir,



Phulbari, Jamalganj, and Dighipara. The total estimated coal reserves in these fields amount to 3,139 million tons. In the 2020-2021 periods, Bangladesh domestic coal production by the public sector was 753,973.00 metric tons where imported approximately 6,751,000.00 metric tons of coal. Coal imports are subject to supply disruptions and price volatility, which can impact the availability and cost of coal in the country.

BCPCL-owned Payra 1320 MW ultra-supercritical coal-fired power plant, the Bangladesh-India Friendship Power Company Limited (BIFPCL) 1320 MW power plant, and the Banshkhali 1320 MW (SSPL) coal power plant collectively require around 40000 tons of coal per day (14.5 million tons of coal per year). Most of this coal is imported to meet their fuel needs.

#### ***Petroleum Scenario of Bangladesh:***

Liquid fuel used in Bangladesh is mostly imported. Bangladesh imports about 1.31 million metric tons of crude oil along with 4.3 million metric tons (approx.) of refined petroleum products per annum. About 0.52 million metric tons per year locally produced gas condensate, which is fractionated mainly into petrol, diesel and kerosene, is the only domestic source of liquid fuel. Major consumer of liquid fuel is transport followed by power, agriculture, industry and commercial sectors. Sector-wise consumption of petroleum products is transport- 63%, power generation 10 %, agriculture 15 %, industry 7 %, domestic 2 % and others 3 %. Yearly petroleum demand 7.3 million metric ton. 6.915 million MT (2021-22 Total Country Consumption), 8% domestic sources production and 92% is imported.

#### **Sector reform during Energy Transition in Electricity Sector Bangladesh:**

Bangladesh has inducted sectorial and structural reform in power sector as influenced by World Bank, ADB, JICA and other supranational agencies and donors forceful policy transfer to obtain foreign assistance. Key reform agendas are,

- Structural and sectorial reform or Unbundling of the sector according to functional lines



- Corporatization of sector entities,
- Establishment of an independent Regulatory Commission
- Competiveness
- Engaging private sectors in electricity market.

#### ***Reform in Electricity Distribution Sector:***

- Rural Electrification Board (REB) was created in 1977 Rural part of Bangladesh
- Dhaka Electric Supply Company (DESCO-1996) to electricity distribution over the area of Mirpur, Gulshan, Baridhara, Tongi and Uttara area of Capital Dhaka.  
Dhaka Power Distribution Company (DPDC) established in October 2006 for electricity distribution part of capital Dhaka and part of Narayanhanj (Excluding DESCO and REB coverage).
- West Zone Power Distribution System (WZPDC) established 2002 21 district of Khulna, Barishal and Greater Faridpu .
- North West Zone Power Distribution system of BPDB has been corporatized as NWZPDC (NESCO)- 2016 16 number of district under Rangpur and Rajshahi division.

#### ***Reform in power Transmission:***

- Power Grid Company of Bangladesh Limited (PGCB) was created in 1996.

#### ***Reform in Generation sector:***

- Ashuganj Power Station Company Limited has been converted into a corporatized entity



- Electricity Generation Company of Bangladesh (EGCB) has been
- North West Power Generation Company (NWPGL)
- Rural Power Company Limited (RPCL) 1994
- Coal Power Generation Company Bangladesh Limited (CPGCL), 2011.
- BPDB-RPCL Power generation Company Limited: B-R Powergen Ltd. was established on 2010
- Bangladesh India Friendship Power Company Ltd (BIFFL) A JV between NTPC & Bangladesh Power Development Board (BPDB) established in 2012.
- Bangladesh-China Power Company (Pvt) Limited (BCPCL)  
Joint-Venture Company (JVC) of NWPGL Bangladesh and China National Machinery Import & Export Corporation (CMC) established in 2014 .
- Independent Power Producers Companies -64 number of Private Power Plant.
- Rental Power Plant (RPP) and Quick Rental Power Plant(QRPP)-10 number of Private Power Plant
- Small IPP REB and SIPP BPDB equals total 14 number of Private Power Plant  
51 private companies

#### **Establishment of Independent Regulator:**

Regulatory Commission (BERC) has been established in 2003 and made functional to regulate the Electricity, Gas and Petroleum sector

#### **Establishment of Public entities for Renewable Energy Promotion:**

- Sustainable and Renewable Energy Development Authority (SREDA). SREDA 2012 as a nodal agency to promote, facilitate and disseminate



sustainable energy (SE), i.e. covering both the areas of Renewable Energy (RE) and Energy Efficiency (EE) to ensure the energy security of the country.

#### **Infrastructure Development Company (IDCOL)**

- *IDCOL offers full range of financing solutions to viable private-sector owned infrastructure projects off-grid renewable energy dissemination in Bangladesh. Started with the Solar Home System program in 2003*
- *has been playing leading role in expanding Solar Home*
- *System (SHS) in rural areas.*
- *Financing energy efficient projects is a recent initiative of IDCOL*

#### **Establishment of Public entities for Research:**

Bangladesh Energy and Power Research Council (EPRC), for bringing technological innovation in energy and power sector as well as to ensuring energy security through research and development.

#### **Establishment of Public entities for Training and human resources development:**

Bangladesh Power Management Institute (BPMI).

#### **Establishment of Public entities for licensing Electrical advisor, chief electric inspector**

- approval for electricity connection in the inspection and testing of all new high and medium voltage electrical substations and installations including industries, factories and factories.
- Electrical contractor license, supervisor competency certificate and technical permit. Facilitate Private power

## Electricity Cost Rationalization Analysis:

### Private Power plant contribution of electricity cost increase:

During 1995 total installed power generation capacity was 2908 MW with no Private sector involvement in generation. During 2000 the total installed electricity generation capacity increased to 3711 MW with 3331 MW in public sector and 380 MW in private sector. The 2007-08 financial year, a total of 27 power plants, comprising 19 public sector power plants and 8 private sector power plants, came together to generate a substantial amount of electricity. These power plants collectively produced 24,314 MKWh (megawatt-hours) of electricity. Out of this total, the public sector power plants accounted for 62.41%, meanwhile, the private sector power plants contributed about 33.59% of the total electricity generated which led to a significant revenue gap of around 657 crore BDT, indicating a deficit between the electricity supply cost and the revenue earned.

During the 2021-22 periods, the power sector witnessed an extensive operation of 153 power plants, with a significant majority consisting of 86 private power plants. The generation of electricity was distributed among various sectors, with the public sector accounting for 37% of the total generation. Joint venture power companies contributed 4.6%, while independent power producers (IPPs) and rental power plants (RPPs) together generated a substantial 48.88%. Furthermore, there was a 9% contribution from power imports. The combined effort of these power sources resulted in the generation of 85,607 MKhwh (megawatt-hours) of electricity. However, amidst the impressive generation figures, there was a significant deficit in revenue, amounting to a staggering increase of 27,000 crore BDT. **65% generated electricity coming from private Sector (i.e. IPP+SIPP+RPP+ Power Import) by which BPDB exhaust 67% cost. Private power plants impact huge on electricity generation cost increase.**

**Electricity supply cost Rationalization on the ground of engaging private power.**

Since the private sector has become a major player in the sector and a major contributor to electricity generation, the installed capacity of private power and the high cost of electricity have increased concurrently. The findings of the studies as follows,

**Creation of opportunities for irrational and predatory cost of electricity by formulating and implementing public policies that goes against the interests of consumers.**

**The state policy support for private sector electricity generation companies to receive excessive investment incentives and unjustified market benefits leading to and a subsequent increase in electricity costs.** Wide range of policy arrangements and institutional framework deployed for of Private Sector Engagement (PSE) in electricity generation of Bangladesh under Private Power Generation Policy -1996 (Revised 2004) and Quick Enhancement of Energy and electricity Special Provision Act 2010. Private Power Generation Policy-1996 (Revised 2004) allows the competitiveness in bidding process to engage Build-Own-Operate (BOO) basis Independent Power Producers (IPPs) projects. Private Investors shall receive an appropriate tariff which is determined through a transparent competitive bidding process. **Moreover, the private investors are allowed to receive guaranteed payment through a structured two-part tariff system that covers the fixed cost (capacity payment) and variable cost (energy payment).** Moreover, standardized security package documents (PPA, IA, LLA, FSA, GSA, etc.), **provision for generous fiscal incentives for engaging private investment**, and single-window operation were the salient features of this PSPGPOB 1996.

**Arbitrary practice by policy implementers due to policy ambiguity which ultimately enables bad implementation.**

The procurement guideline in PSPGPOB -1996 (Revised-2004) seems unclear, as it only contains the provision of solicitation of the proposal through competitive bidding by RFQ and RFP. Moreover, the competitive tendering process as stipulated in PSPGPB-1996 has shortcomings of multiple accounts such as the absence of legislation, unclear procurement guidelines, not linked with PPR-2008, etc. **Hence its implementation is subjected to arbitrary practice due to policy**

ambiguity which ultimately enables bad implementation.

#### Diminished Competitiveness through this policy framework (Quick Energy and Electricity Special Provision Act 2010):

In contrary to the conventional bidding process, the most exercised mode of PSE in Bangladesh allows non-competitive engagement (known as “unsolicited proposal”) through case-by-case negotiation under the **Quick Enhancement of Energy and electricity Special Provision Act 2010**. It has been used as a special policy instrument for the treatment of unsolicited proposals. Provision of treating of unsolicited proposals by avoiding complete bidding process allows the private investor to engage their capital quickly **which created a window of opportunity for the private sector to exploit the negotiation environment by private investors to obtain unjustified benefit causing irrational cost increase of electricity.**

- **Quick Enhancement of Energy and electricity Special Provision Act 2010 allows** bypassing the tendering process for the sake of quick power with no regulation, limit, or guideline of such activity. The Act seems to have significant policy broadness and vagueness. This provision has omnipresence in both the power sector and the energy sector which is can be termed as policy broadness.
- A total of 48 out of 86 private power plants have been awarded under this Special Provisions Act through direct negotiation. Stripping or discontinuing this Act will create an immediate policy void in the power sector because there is no provision for treating the unsolicited proposals in PSPGPB-1996.
- **Continued prevalence of this Act works against the inherent spirit of public procurement (in terms of Transparency, Accountability, Competition, and Efficiency).** This puts the energy and power sector governance under question when this law indemnifies public officials and destroys the sense of competitiveness by which consumer can get electricity at best price.

- **Unclear procurement guideline and treatment of unsolicited proposal by an inappropriate e law like Special Provision Act 2010 has created an unruly opportunity of profit maximization for private companies to invest in market lacks competitiveness. Additional cost arises from private sector’s profit maximization has imposed to the consumers.**

#### The Nature of Private Power Plants and Modes of their Engagement prime cause for Persistent Cost Increases and Crisis in the Electricity Sector of Bangladesh:

Almost 80% of the peak load power plants in Bangladesh are owned by Independent Power Producers (IPPs). Out of the total 86 private plants, 50 of them rely on heavy fuel oil (HFO) or high-speed diesel (HSD) as their primary fuel source. **These liquid fuel-based peaking power plants, while designed for peak load operation, end up operating as base load plants, resulting in expensive cost in electricity production.**

**Price volatility usually increase of liquid fuel in international market resulted increasing cost of electricity. Conversely, price reduction in international market for liquid fuel has seen no impact on cost of electricity generation. On the other hand, private power plant receives additional tax benefit by importing liquid fuel for own power plants.**

**Implementation of Politically motivated agendas predominantly engrossed focus on installed Capacity and coverage of electricity and neglecting affordability, Least Cost, and Energy Security:**

Since Last 10 years the generation installed capacity increases at 12% growth whereas actual electricity production has increased at 7% rate. **That indicates overinvestment or overcapacity resulted underutilization of installed capacity. Underutilization of installed capacity has cost implication in their two part tariff structures state obligation of capacity payments for idle power plants.**

**Delayed Retirement of Contractually Expired RPP allows extended operation**

### at higher cost:

Highly expensive liquid fuel based Quick rental power plants added during 2010-2013 in a quick manner at exorbitantly higher price under Quick Enhancement of Energy and electricity Special Provision Act 2010 received extended tenure operation at exorbitantly higher tariff though they recovered their full investment with enough profit during contracted tenure. Multiple extension of **Contractually Expired rental power plants at higher cost resulted increase of cost of generation of electricity.**

### Unequal treatment to public power plants over private power plants and uneven Level playing field:

Public electricity generation utilities face unequal treatment in fuel distribution (Gas price and availability) that reduces the capacity of public power plants. **Additionally, private companies are permitted to establish joint ventures with public sector companies, following the Independent Power Producer (IPP) model some of those set-up large coal-based power plants with high generation cost due to reliance on imported coal. These caused increase of cost of electricity.**

### Uneven risk distribution, majority of market risk attributed to consumers which has the huge cost implication and irrational cost increase.

The majority of Market risk is attributed to the consumers. The study has found the public sector is solely responsible for assuming market-related risks such as Currency Devaluation, Electricity demand, inflation, and fuel price risk. Among these risks of Currency Devaluation, inflation, and fuel price risk are directly assumed through tariffs given to private power plants for electricity purchase.

### Inconsistent development of Primary fuel supply Capacity with Electricity generation installed capacity has created a huge dependency of importation

### of fossil fuel:

Remaining recoverable indigenous gas reserves in Bangladesh will last up to 2026 at current level of consumption though more than 50% power generation installations are gas based. Around 15 million tons of coal is expected to be imported for the operation of large coal-based power plants, while the annual domestic production stands at approximately 1 million tons. Imported petroleum currently satisfies 92% of the nation's demand. Increased international LNG and liquid fuel prices have contributed to an increase in the revenue deficit and subsequent subsidies. Furthermore, the sector's poor financial health hindered it from importing more fuel at even at higher prices, resulting in more electricity shortages at consumer's end. On the one hand, consumers are forced to shoulder an unbearable burden of cost increase, while on the other hand, they face a lack of electricity and energy supplies. As Renewable Energy did not scale up, new indigenous gas and coal harness capacity development did not materialize as per the increasing demand of electricity sector so **Uncertainty and inconsistency of the energy sector seem to have created an environment for unscrupulous overestimation of demand and to be more reliant on liquid fuel private power plants contributed the unaffordable cost of electricity.**

### Bangladesh Power sector ended with subsidies resulted from long term fiscal deficit:

- Consistent cost increases result in a massive fiscal deficit for the single buyer BPDB since BPDB must purchase electricity from private power plants at ever-increasingly higher prices each year, and underutilization of installed capacity results in massive capacity payments to idle power plants. Huge revenue deficit built over time as a result of irrational cost increases, predator costs, and unjustifiable profit maximization by private sector part of revenue shortfall reduced by state bailout in the form of budget transfer or subsidy by consumer's money. At a certain point, the government began executing withdrawal of subsidies, and the irrational cost of electricity began to pass through tariff and imposed on customers.

### Diminished Accountability through implementing BERC amendment Act

### **2022 increase electricity tariff /price without public hearing.**

- Increasing irrational costs of electricity over time allows for an increase of the fiscal deficit and subsidies. To withdraw subsidies, the government enacted the BERC Amendment Act 2022, which allows the government or ministries to increase electricity tariffs instead of BERC and without a public hearing, limiting the authority of the independent regulator BERC, which is in responsible for protecting consumer interests.

### **Bangladesh must increase its use of renewable energy sources since a fuel crisis is looming and energy security is at stake.**

The natural gas remaining reserves will be last up to 2026 if annual consumption at a level of 0.97 tcf(2018with of 0.97 TCF in 2018, and Local production can only meet 5 percent of the total energy demand. Therefore, Bangladesh's current trajectory with respect to future generation capacity likely to be extremely import dependent which shall put Energy security in danger. To withstand at current level of economic growth the more demand of electricity will be created and according to current level of retirement schedule of existing power plants by 2041 the installed capacity will remain 8000 MW if no capacity added). Therefore, the continues capacity addition is required form sustainable energy sources.

### **As a signatory to the Paris Agreement, Bangladesh is globally committed to increasing the use of sustainable and renewable energy sources.**

Bangladesh is a signatory to the Paris Agreement and maintains a global commitment to limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C and offered 40% clean energy generation by 2041) and 6.73% (27.56 MtCO<sub>2</sub>e) emission reduction in the unconditional scenario. The energy sector will mostly meet the carbon reduction target (according to the updated Nationally Determined Contributor NDC-2021

### **Bangladesh lacking proper planning to Scale up Renewable Energy sources:**

he electricity generation target from Renewable energy sources has entangles with the state goal of achieving 10% RE of total power in Bangladesh. Power system management plans that have been successful (2010, 2016), Bangladesh's Renewable Energy Policy 2008 (achieve 5% by 2015 and 10% by 2020), and the SDG target (energy consumption to 10% by 2030 (SDG Indicator 7.2.1)-all aim to reach 10% electricity generation from renewable sources. Renewable energy was never regarded as a viable alternative to fossil fuels, as indicated by state policies and infrastructure development (for example, grid connectivity).

### **Bangladesh Shall Scale up Renewable Energy since it is going to be the cheapest and cost-effective way to ensure energy security**

In Bangladesh, electricity generation capacity from Renewable sources accounts for around 4% of total generation capacity (on and off grid), with a grid-connected solar PV potential of approximately 50000 MW(USAID) and National Renewable Energy Laboratory (NREL) study-the gross wind potential is greater than 30000 MW. The global price of solar energy has reduced by more than 80% since 2010. Between 2010 and 2021, the global weighted average LCOE of newly commissioned offshore wind projects declined by 60%, from USD 0.188/kWh to USD 0.075/kWh. Solar power's price drop trend in India is overwhelming; by 2030, the predicted unit price of solar electricity would be 1.9-2.6 Rs, while wind electricity would be 2.3-2.6 Rs. In an untapped RE environment, the average labeled cost (Contracted) of Solar electricity in Bangladesh 2022-23 is 9.99 US cents and Wind electricity is 13.22 BDT. Such global and regional experience suggests that with sufficient technical competence, a wide range of policy support, and a level playing field, RE can be a cost-effective option for sustainable clean electricity for energy security. Aside from clean energy, renewable energy sources should be regarded as a reliable option during supply chain disruptions and price volatility when compared to imported fossil fuel-based electricity generation.